

Okanagan Senate

THE NINTH REGULAR MEETING OF THE OKANAGAN SENATE FOR THE 2016/2017 ACADEMIC YEAR

THURSDAY, 18 MAY 2017

3:30 PM | ASC 130

1. Senate Membership– Dr Kate Ross

New Member (information)

Ms Kelsey DesRoches, Student Representative At-Large, to fill a vacancy.

Nominating Committee (information)

A second call is made for two (2) student representative to serve on the Senate Nominating committee. Nominations are due by 4 pm on Friday 15 September 2017 to christopher.eaton@ubc.ca. If more than two students are nominated, an election will be held at the September meeting of Senate in accordance with Rule 24 (e) of the *Rules and Procedures of Senate*.

2. Minutes of the Meeting of 27 April 2017 – Dr Santa Ono (approval) (docket pages 4-13)

3. Business Arising from the Minutes – Dr Santa Ono

- a. Biochemistry Major (information)
- b. Email regarding Point of Order (information) (docket pages 14-15)

4. Remarks from the Chair and Related Questions – Dr Santa Ono

5. Remarks from the Deputy Vice-Chancellor and Related Questions – Prof. Deborah Buszard

6. Candidates for Degrees – Dr Santa Ono

A list of graduands are available from the Registrar before or at the meeting.

The Chair calls for the following motion:

That the candidates for degrees, as recommended by the faculties and the College of Graduate Studies, be granted the degrees for which there were recommended, effective June 2017, and that a committee composed of the registrar, the appropriate Dean(s) or their appointed designates, and the Chair of the Okanagan Senate, be empowered to make any necessary adjustments. (2/3 majority required)

7. Academic Building & Resources Committee – Dr Daniel Keyes

Annual Report (information) (docket pages 16-19)

8. Academic Policy Committee – Dr Miriam Grant

- a. Administration of the Master of Engineering Leadership Resource Engineering Management outside the College of Graduate Studies (approval) (docket pages 20-23)
- b. Materials and Manufacturing Research Institute (approval) (docket pages 24-180)

9. Admissions & Awards Committee – Dr Marianne Legault

- a. Changes to Classifications of Students – Qualifying and Auditor Classifications (approval)(docket pages 181, 183-191)
- b. Master of Social Work- Changes in Admission Requirements (approval) (docket pages 182, 192-199)
- c. International Undergraduate Student Admission – Reconsideration of the May 1996 Senate Resolution (approval) (docket pages 200-215)
- d. Annual Reports (information) (docket pages 216-217)

10. Agenda Committee – Dr Daniel Keyes

Amendments to the Rules and Procedure of Senate (approval) (docket page 218)

11. Appeals of Academic Standing & Discipline Committee – Dr Robert Campbell

Annual Report (information) (docket pages 219-222)

12. Curriculum Committee – Dr Peter Arthur

May Curriculum Report (approval) (docket pages 223-239)

13. Learning & Research Committee – Ms Catherine Comben

Emeritus Appointments (approval) (docket pages 240-241)

14. Nominating Committee – Dr Daniel Keyes

- a. Adjustments to Committee and Council Assignments (approval) (docket pages 242-243)
- b. Election of a Vice-Chair from 19 May 2017 to 31 August 2017 (approval) (docket page 243)
- c. Triennial Review (approval) (docket pages 243-244)
- d. President's Advisory Committee for the Selection of a Vice-President Human Resources (approval) (docket page 244)

15. Report from the Provost – Dr Cynthia Mathieson

- a. Reviews of Academic Units (information) (docket pages 245-251)

- b. Annual Report on Research Institutes – with Vice-Principal Philip Barker (information) (docket pages 252-384)

16. Report from the Registrar – Dr Kate Ross

2017-2020 Triennial Election Results (approval) (docket pages 385-387)

17. Other Business

Thanks to all Senators for the 2014-2017 triennium, especially those not returning.

NB: Reception to follow.

The Rules and Procedures of the Okanagan Senate states that meetings will adjourn no later than 5:30 p.m. Regrets: Telephone 604.822.5239 or e-mail: facsec@mail.ubc.ca

UBC Senates and Council of Senate website: <http://www.senate.ubc.ca>



OKANAGAN SENATE

MINUTES OF 27 APRIL 2017

DRAFT

Attendance

Present: Dr D. Buszard (Vice-Chair), Dr K. Ross (Secretary), Mr A. Aghshahi, Ms L. Allan, , Dr P. Barker, Dr L. Berg, Ms H. Berringer, Dean B. Binsted, Mr M. Campbell, Dr R. Campbell, Dr D. Carter, Ms C. Comben, Dr J. Corbett, Dr R. Eggleston, Dr M. Evans, Dean M. Grant, Ms M. Harper, Dr J. Jakobi, Dr D. Keyes, Dr C. Labun, Dr R. Lalonde, Dr R. Lawrence, Dr S. Lawrence, Dr M. Legault, Ms K. Lu, Dr Y. Lucet, Ms M. Ly, Dr V. Magnat, Mr Dr C. Mathieson, J. McEwan,, Dr S. McNeil, Ms K. Morgan, Dr S. O’Leary, Dr J. Stites Mor, Dean R. Sugden, Dean W. Tettey, Ms H. Tjioe, Ms J. Tom, Dr G. Wetterstand, Dr P. Wylie.

Regrets: Dr P. Arthur, Mr I. Cull, Dean B. Frank, Chancellor L. Gordon, Ms G. Hardy-Legault Dr J. Johnson, Mr D. Kandie, Mr K. Lee, Ms E. Lewis, Ms B. MacKenzie-Dale, Dean M. Parlange, Dr F. Pena, Dr R. Sadiq, Dr D. Walker, Ms J. Vinek.

Clerk: Mr C. Eaton

Call to Order

Professor Deborah Buszard, Vice-Chair of the Senate, called the meeting to order at 3:31pm.

Senate Membership

New Members:

- Mr Daniel Kandie, Representative of the Students At-Large (Continuing)
- Ms Emily Lewis, Representative of the Students At-Large
- Ms Kelly Lu, Representative of the Students At-Large (Continuing)
- Ms Kristen Morgan, Representative of the Students At-Large
- Ms Janessa Tom, Representative of the Students At-Large
- Ms Megan Harper, Representative of the Graduate Students
- Ms Brittnei MacKenzie-Dale, Representative of the Graduate Students
- Ms Kyle Lee, Student Representative, Faculty of Applied Science
- Ms May Ly, Student Representative, Faculty of Arts & Sciences
- Ms Gilliane Hardy-Legault, Student Representative, Faculty of Creative & Critical Studies
- Mr Arash Aghshahi, Student Representative, Faculty of Health & Social Development
- Ms Hillary Tjioe, Student Representative, Faculty of Management

NB: Vacancies are presently being filled for the Student Representative for the Faculty of Education and one additional student at-large.

Nominating Committee

The Registrar issued a call for nominations for two (2) student members of Senate to serve on the Senate Nominating Committee until 31 March 2018 and thereafter until replaced.

Minutes of the Previous Meeting

Gordon Binsted	}	<i>That the Minutes of the Meeting of 30 March 2017</i>
Catherine Comben		<i>be adopted as presented</i>

Approved

Business Arising from the Minutes

The Acting Secretary, Mr Eaton advised that the Major in Biochemistry and Molecular Biology was still under reconsideration by the Senate Curriculum Committee and that he expected them to report back on the matter by the May meeting of Senate.

The Deputy Vice-Chancellor advised that she had reviewed the matter of graduate funding following comments during the budget presentation at the last meeting. On a full-time equivalent basis, basis, Vancouver has \$2794, and Okanagan has \$2820 per graduate student available from General Purpose Operating (GPO) funding.

Senator Evans asked if this took into consideration professional programs and endowments.

Dr Buszard replied that the above amounts were based on GPO funding only.

Remarks from the Deputy Vice-Chancellor

Professor Buszard noted that within UBC the strategic planning process continues to move ahead. There will be ongoing work over the summer by eight task forces that will be working to build a draft of the plan for further consultations in the fall with the intention of bringing the final version to Senates and Board by the end of the calendar year.

The search for the next Dean of Applied Science has been launched and the advisory committee has been established according to policy, unique at this point for a cross campus Faculty. Dr Buszard advised that the search committee was jointly chaired by herself and the Provost *Pro Tem.* for Vancouver Angela Redish and herself, and included two Faculty members from Okanagan's Engineering School: Professors Stephen O'Leary and Mina Hoorfar.

The Principal advised that on 13 April 2017 the UBC Board of Governors met. Two major items were approved at that meeting: the 2017-2018 Budget and a new Policy on Sexual Assault and the new policy on Sexual Assault and Other Sexual Misconduct. The latter was developed after

extensive consultation with the university community. Investigations into sexual assault and other sexual misconduct at UBC will henceforth be guided by Policy #131 Sexual Assault and other Sexual Misconduct which takes effect next month. It includes a new process to respond to and investigate allegations of sexual misconduct; reporting options and supports for UBC community members affected by sexual misconduct; and education initiatives for the UBC community on the prevention of sexual misconduct. The policy will make it easier for people who have experienced sexual violence to come forward, get the support they need, and build confidence and trust in the investigation process.

To the first matter, Dr Buszard advised that the UBC 2017/18 budget was approved by the Board. It projects an \$86m increase in operating revenue from 2016-2017 to 2017-2018. This included increases in international tuition revenue and provincial funding for general wages increases which are largely allocated directly to support faculties and operating units. A total of \$40m is available for strategic investment in 2017-2018 across both campuses. An additional \$20m (up from \$6m in 2016-2017), is available in the Excellence Fund to support enhanced teaching, research and student experience. The UBC Okanagan operating budget was presented as part of the larger overall package.

Dr Buszard noted that the previous evening, UBC's Okanagan campus had recognized the 2017 long service award recipients at a reception for Linda Allan, Donovan Hare, James Robinson, Greg Wetterstrand, Bob Belton, Nina Langton, Joan Bottorf, Mary Ann Murphy, Kim Filice, Carol Boyd and Fred Vogt all with 25 years' service.

The Principal, noting recent controversies regarding the financial situation of the UBC Students' Union Okanagan (UBCSUO), advised that its Directors and Executive were working on the parameters for an the external review of their operations.

Finally, Dr Buszard reminded Senators of the upcoming Learning Conference 3 May, followed by the teaching awards reception on 4 May.

Senator Wylie asked for details on the increase in the Provost office funding in the budget approved by the Board of Governors and in previous years.

With permission of Senate, Associate Vice-President Finance Robert Einarson replied that an Associate Provost position was created, and the existing budgets for Enrolment Services, Co-op and wellbeing, and equity were moved into the budget for the Provost's Office from other departments.

Academic Policy Committee

The Chair of the Committee, Dr Miriam Grant, presented.

REVISIONS TO ACADEMIC REGULATIONS FOR THE BACHELOR OF EDUCATION PROGRAM

Miriam Grant
Wisdom Tettey

}

That Senate approve the academic regulations for the Bachelor of Education proposed by the Faculty

of Education as set out in the attached two-column form.

Approved

REVISIONS TO ACADEMIC REGULATIONS FOR THE BACHELOR OF SCIENCE IN NURSING

Miriam Grant	}	<i>That Senate approve the academic regulations for the Bachelor of Nursing proposed by the School of Nursing as set out in the attached two-column forms.</i>
Wisdom Tettey		

Dr Grant These changes were in response to a review undertaken by the school and build on early changes as approved by by Senate in January 2016. These revisions specifically addressed social media conduct, and rules around re-admission.

Approved

Admission & Awards Committee

The Chair of the Admissions & Awards Committee, Dr Marianne Legault, presented.

MASTER OF SCIENCE IN NURSING – CHANGES IN ADMISSION REQUIREMENTS

Marianne Legault	}	<i>That Senate approve the change to admission requirements for applicants to the Master of Science in Nursing program effective for admission to the 2018 Winter Session and thereafter.</i>
Catherine Comben		

Approved

CONDITIONAL ADMISSION TO THE BACHELOR OF MEDIA STUDIES VIA THE ENGLISH FOUNDATION PROGRAM

Marianne Legault	}	<i>That Senate approve the admission requirements for conditional admission to the Bachelor of Media Studies via the English Foundation Program, effective for admission to the 2017 Winter Session.</i>
Catherine Comben		

Approved

NEW AND REVISED AWARDS

See Appendix A: Awards Report

Marianne Legault	}	<i>That Senate accept the new and revised awards as listed and forward them to the Board of Governors for approval; and that a letter of thanks be sent to the donors.</i>
Catherine Comben		

Approved

Curriculum Committee

APRIL CURRICUM REPORT

See Appendix B: Curriculum Report

Sean Lawrence	}	<i>That Senate approve and recommend to the Board of Governors for approval the new courses, a new minor for the BA, a revised program, and a new course code brought forward from the Faculty of Arts and Sciences, a new course brought forward from the Faculty of Creative and Critical Studies, a new course brought forward from the Faculty of Education, and a revised program and new courses brought forward by the Faculty of Health and Social Development.</i>
Yves Lucet		

Senator Wylie asked if the BA Minor in Data Science . He noted that 30 credits were required in data science but that UBC did not have that number of credits available.

Senator Lucet agreed that it wasn't a disciplinary minor, and so the 30 credits must be taken from that list.

By general consent, a definition of courses that were considered as part of the discipline of data science was added for the BA Minor in Data Science.

Approved

Nominating Committee

The Acting Secretary updated Senate on the recent Joint Meeting of Board and Senate Standing Committee Chairs. He noted that the chairs had agreed to meet regularly, ideally once per term but at least one per year, as a communications forum for areas of mutual interest.

Other Business

GOVERNANCE AND ADMINISTRATION OF THE FACULTY OF EDUCATION

Peter Wylie	}	<i>That Senate constitute an ad hoc committee to consider and report on these violations of Policies 21, 22 and 23 and recommend a process of consultation with Senate regarding discussion of options and alternatives that may or may not include a possible discontinuance of the Faculty of Education and/or processes regarding the appointment of a Dean and a Head/Director in keeping with Policies 21, 22 and 23. In the alternate, that the matters be referred to the Academic Policy Committee and/or any other relevant Senate committees for recommended actions.</i>
Kristen Morgen		

Senator Wylie read a series of whereas clauses in support of his motion as follows:

Whereas:

1. UBCO Faculty of Education is a Faculty of UBC Okanagan campus, so constituted under the University Act;
2. It has been without a Dean since February 2014, over 3 years, in violation of Policies 21 and 23, and a series of Acting Deans have been appointed by University administrators;
3. It has had Head/Directors appointed by University administrators to look after Collective Agreement matters such as workload, tenure and promotion in the Faculty since 2014 without the administration following Policy 22 on the appointment of such Head/Directors;
4. Senate is the body with the power under the University Act to recommend to the Board the discontinuance of a Faculty;
5. University administrators have told the Faculty that it can no longer continue as a Faculty;
6. Discussions are in an advanced stage between administrators in Vancouver and the Okanagan with regard to the Faculty being discontinued and reconfigured as an Institute under the administration of the UBC Vancouver Faculty of Education;
7. To date, Senate or any of its Standing Committees has yet to be consulted on the possible discontinuance of the Faculty.

The Vice-Chair noted that having read this motion that there were serious allegations made in the preamble to this motion as just read by Senator Wylie. She asked that Secretary advise on how best to consider the format.

Upon recognition by the Chair, the Acting Secretary advised that the operative text was from “That Senate constitute”; whereas clauses are generally only considered to be background material. He suggested that the motion moved covered two separate matters – allegations regarding a violation or violations of Board/Senate policy, and secondly the matter of consultation and consideration of the future of the Faculty of Education. He suggested that this motion may best be considered by dividing it along those lines, so that the matter of allegations of breach of policy were considered separately from those around the faculty organization of UBC as they were not directly related matters. He further suggested that if the matter was referred, that as Senator Wylie suggested it would make most sense of have these issues considered by the Academic Policy Committee so that more information could be considered than were available to the Senate at this time.

Senator Wylie noted that he would be fine with the matter being referred to the Academic Policy Committee.

The Vice-Chair asked the Chair of the Academic Policy Committee if she would be amenable to such a referral.

Dean Grant, Chair of the Senate Academic Policy Committee, replied that she would be.

The Vice-Chair asked Dr Wylie if he would be comfortable with such a referral with their report back potentially recommending the matters being considered separately.

Senator Wylie stated that he would move such a referral.

At the request of the Chair, the Acting Secretary confirmed that a motion to refer was debatable as to the propriety of the referral.

Peter Wylie	}	<i>That this matter be referred to the Senate Academic Policy Committee for review and recommendation and they be directed to report back to Senate with the results of their review and any recommendations that they may have at the September 2017 meeting of Senate.</i>
Kristen Morgen		

**Motion to Refer
Approved**

Adjournment

There being no further business, the meeting was adjourned at 4:12 pm.

Appendix A: Awards Report

New Award:

APEGBC Municipal Engineers Division Scholarship

A \$1,000 scholarship is offered by the Municipal Engineers Division of the Association of Professional Engineers and Geoscientists of BC to a fourth-year student in the civil engineering program in the School of Engineering in the Faculty of Applied Science at the University of British Columbia, Okanagan campus. (First award available for the 2017 Winter Session)

Revised Awards:

(Previously-approved awards with changes in terms or funding source):

Graduate Dean's Entrance Scholarship

Graduate Dean's Entrance Scholarships (GDES) are based on merit and offered to incoming full-time thesis-based master's and doctoral students at UBC's Okanagan campus. Students who have submitted a complete admission application by the deadline for each admission cycle will receive priority consideration for these awards. Students who do not meet the deadline may still be considered for these awards, but only when all students who have submitted applications by the deadline have been considered.

Eligible students must have a GPA of first-class standing. In addition, the admission application's supporting documentation (CV, reference letters, letter of intent) are used for adjudication purposes. The minimum value of the Graduate Dean's Entrance Scholarship is \$5,000. This award value may be increased by increments of \$2,500 to a maximum of \$25,000. However, if the student holds a major external award, such as NSERC, SSHRC or CIHR, a maximum amount of \$15,000 may be awarded in addition to the major award. The funding for the GDES award will be made available from the University budget. The value of the award is reviewed annually.

Awards are made on the basis of nominations provided by graduate programs to the College of Graduate Studies.

Rationale: The proposed changes to the Graduate Dean's Entrance Scholarships (GDES) application procedures are the outcome of multiple conversations with staff, faculty, and faculty administrators, culminating in a meeting of College of Graduate Studies Council on October 19, 2016, in which these changes were approved by a formal vote of the members present.

The changes proposed for this scholarship application process are intended to give Graduate Programs greater flexibility in the ability to award a GDES to students, regardless of whether or not students have submitted a "complete" application by the deadline. Students who are still gathering their documentation after an application

deadline has passed may be awarded a GDES at the discretion of their Graduate Program, if the Faculty deems the student to be outstanding.

Under the previous application procedures and requirements for this award, CoGS rejected requests from Graduate Programs that sought to give GDES awards to students who had missed the application submission deadline. These changes give Graduate Programs greater flexibility and control over whom to award. Effective Session 2017W

University Graduate Fellowship

The University Graduate Fellowship (UGF) is awarded to current graduate students with first class standing engaged in a full-time thesis-based program at UBC's Okanagan Campus. Eligible students must have a GPA of first-class standing in each of the last two years of full-time study (or full-time equivalent). Current students, enrolled in a UBC Okanagan graduate degree program are eligible provided they are making satisfactory progress in their program. Annual progress reports must be completed by both the student & supervisor/advisor, reviewed by the program coordinator, and submitted to the College of Graduate Studies by June 15th of each year to qualify for the award. This award may be received in increments of \$3,000 to a maximum of \$24,000. However, if the student holds a major external award, such as an NSERC, SSHRC or CIHR, a maximum amount of \$15,000 may be awarded in addition to the major award. The funding for the UGF award will be made available from the University budget. The value of this award is reviewed annually.

Awards are made on the basis of nominations provided by graduate programs to the College of Graduate Studies. Nominations for current students may be submitted to the College of Graduate Studies as they are determined by the graduate program.

Rationale: The proposed changes to the University Graduate Fellowship eligibility are the outcome of multiple conversations with staff, faculty, and faculty administrators, culminating in a meeting of College of Graduate Studies Council on October 19, 2016, in which these changes were approved by a formal vote of the members present. The annual application process that has been in place for this award places administrative burdens on College of Graduate Studies staff, and application burdens on students and faculty that have been deemed onerous and unnecessary. The revised awarding process will be linked to student academic standing and annual graduate student progress reports that graduate programs currently are required to submit yearly and will continue to submit under a revised schedule. The information in these progress reports, coupled with the academic standing of the student, sufficiently replicates the information required in the current UGF application process that this process seems unduly repetitive. Effective Session 2017W

Appendix B: Curriculum Report

FACULTY OF ARTS AND SOCIAL SCIENCES

- i. Major and Minor in Data Science Program Requirements (revised program)
- ii. BA Data Science Minor (new minor for BA)
- iii. ANTH 218 (3) Tourism, Desire and Difference (new course)
- iv. ANTH 418 (3) Travel, Migration and the Politics of Mobility (new course)
- v. ANTH 230 (3) Culture, Happiness, and Wellness (new course)
- vi. ANTH 312 (3) Anthropology of Religion (new course)
- vii. ANTH 412 (3) Religion in a Changing World (new course)
- viii. FDSY - Food Systems (new subject course code)
- ix. FDSY 221 (3) Food Systems I: System Thinking (new course)
- x. GEOG 221 (3) Food Systems I: System Thinking (new course)
- xi. GEOG 380 (3) Fundamentals of Geographic Information Science I (new course)
- xii. EESC 380 (3) Fundamentals of Geographic Information Science I (new course)
- xiii. GEOG 381 (3) Fundamentals of Geographic Information Science II (new course)
- xiv. EESC 381 (3) Fundamentals of Geographic Information Science II (new course)
- xv. .PHIL 391 (3/6) d Topics in Philosophy (new course)
- xvi.

FACULTY OF CREATIVE AND CRITICAL STUDIES

- i. ENGL 009 (3) Preparation for University Writing (new course)

FACULTY OF EDUCATION

- i. EPSE 406 (3) Typical and Atypical Development in Infants and Children (new course)

FACULTY OF HEALTH AND SOCIAL DEVELOPMENT

- i. SOCW 515 (3) Social Welfare Policy in Canada (new course)
- ii. SOCW 516 (3) Foundations of Ethical Practice (new course)
- iii. SOCW 517 (3) Social Work and Indigenous Peoples in Canada (new course)
- iv. Master of Social Work Degree Requirements (revised program)



Dr Peter Wylie
Joint Faculties Senator
VIA EMAIL

15 May 2017

Dear Dr Wylie,

In email circulations to almost all Senators in early May, you made several accusations towards the Vice-Chair of Senate, Dr Deborah Buszard; in particular, that she “violated the Rules and Procedures of the Okanagan Senate in not allowing [you] to speak to [your] moved and seconded motion..or answer questions about it.”

For your information Senate meetings are recorded. This recording is used as a memory aid for me and my staff in preparing the formal Senate minutes. Normally, those recordings are deleted once the minutes are accepted as the formal proceedings of the meeting in question. Thus we still have a recording of the meeting in question to refer back to, and would be pleased to make that recording available to you or any other Senators upon request.

To the question in your email, yes, as I stated at the meeting in reply to a question from the Vice-Chair, a motion to refer is debatable, but only on the matter of the referral, not on the substance of the main motion being referred. In this instance, the matter is complicated because the motion to refer was also made by you and it is not permissible to speak against one’s own motion. In such a situation, the procedural resolution to speak to the main motion would be to request to withdraw your motion to refer, and if allowed by the Senate, to then seek to be recognized to speak to the main motion (and then if so desired, move again to refer). You gave no indication at the meeting that you wished to do this. Had you inquired, either through a formal parliamentary inquiry to the chair, or an informal question, you would have been given advice on how to address this at the time.

With regard to your accusation against Dr Buszard, that you feel that your rights have been violated is a serious charge, and deserves consideration to protect your rights and the rights of the Senate as a whole. With respect however, the proper course of action if a senator believes the Rules and Procedures of Senate are not being followed is to raise this as a point of order with the presiding officer when the alleged violation occurs. To quote Section 23 of the Senate’s Parliamentary authority, Roberts Rules of Order Newly Revised, “If a question of order is to be raised, it must be raised promptly at the time the breach occurs... The only exception to the rule that a point of order must be made at the time of the breach arise in connection with breaches that are of a continuing nature, in which case a point of order can be made at the time during the continuation of the breach.” There is no continuation of a breach, and thus this is not such a situation, and in any event, email is not a session of the Senate where questions of order can be raised. The Senate has considered the conduct of business before Senate via email several times



in the past, and has rejected the notion. If a senator believes that the Senate has erred in making a decision, or wishes to address a matter already decided, there are a variety of procedural recourses available to a member after the fact. The Rules and Procedures provide that such matters are to be addressed by presiding officer on the Senate floor, subject to appeal to the Senate as a whole under Rule 21 (m), not through email correspondence. Should you wish to revisit the matter of the referral properly, my staff and I would be pleased to advise you on potential ways to do so.

With the consent of the Senate Agenda Committee, I am copying this letter to the full Senate via business arising so that they are aware of my concerns.

Yours sincerely,

Christopher Eaton
A/ Secretary to Senate

Copy: Senate through Business Arising
Chair and Vice-Chair of Senate



18 May 2017

To: Okanagan Senate
From: Senate Academic Building Needs Committee
Re: **Annual Report** (information)

Please find attached the 2016-17 Annual Report of the activities of the Senate Academic Building and Resources Committee.

Respectfully submitted,

Dr. Daniel Keyes, Chair

Senate Academic Building and Resources Committee



Senate Academic Buildings and Resources Committee

Report to Senate – May 18, 2017

Committee Background and Terms of Reference

The mandate and responsibilities of the Senate Academic Buildings and Resources Committee are set out in its terms of reference:

Responsible for recommending the following to Senate:

- *An annual report outlining the work of the Committee and the physical and budget resources available for the development and maintenance of the campus.*

Delegated authority over the following by Senate:

- *Reviewing, raising issues, and monitoring the implementation of the Campus Master Plan;*
- *Recommending priorities on new academic buildings with consideration for the needs of academic and non-academic buildings, balance between type of teaching spaces, and relationship to physical plant and planning; and*
- *Reviewing and raising issues regarding the impact of every development, whether building or landscape, on the total teaching and academic resource.*

Alongside the responsibilities set out in its terms of reference, the Senate Academic Building and Resources Committee also serves as the Okanagan sub-committee of the Council of Senates Budget Committee and is responsible for fulfilling the mandate of the Council of Senates Budget Committee on the Okanagan campus. The terms of reference of the Council of Senates Budget Committee are as follows.

The Budget Committee shall:

[M]eet with the President and assist in the preparation of the University budget; and make recommendations to the President and to report to the Okanagan and Vancouver Senates at least annually concerning academic planning and priorities as they relate to the preparation of the University budget.



In advising the President on the University budget, the Budget Committee may request information on any of the University's fund accounts.

The complete Council of Senates Budget Committee includes representation from both campuses. The full Budget Committee has not met in the current triennium, leaving fulfilment of its terms of reference to the Senate Academic Building and Resources Committee, and its counterpart on the Vancouver campus.

Activities

During the 2016-17 academic year, the Committee met on seven occasions. The agendas for each meeting were set through the collaboration of the committee Chair, the Deputy Vice-Chancellor and Principal, and the Associate Vice-President, Finance and Operations to ensure that items that are a priority for the committee and for the two vice-presidential offices are brought forward. The Deputy Vice-Chancellor and Principal and the Associate Vice-President, Finance and Operations also regularly attended committee meetings.

The topics addressed by the Committee during the 2016-17 academic year include the following:

Meeting Date	Subject	Presenters and Guests
September 22, 2016	Academic Resources <ul style="list-style-type: none"> a. Teaching and Learning Centre b. Learning Factory c. Space Management Committee Budget 2017/18	D. Buszard R. Einarson
November 10, 2016	Budget Update <ul style="list-style-type: none"> a. Budget Planning 2017/18 b. Teaching and Learning Enhancement Fund c. Excellence Fund Space Management <ul style="list-style-type: none"> a. Innovation Park b. Teaching and Learning Centre c. Classroom Management 	R. Einarson C. Morcom
	Budget Update	D. Buszard



January 12, 2017	Capital Project Update	R. Einarson C. Morcom
February 9, 2017	Traffic Controls – EME Building Monitoring of Newly Commissioned Buildings	D. Buszard R. Einarson S. Kayfish
March 9, 2017	Budget 2017/18 Update Budget Metrics	D. Buszard R. Einarson S. McKeown C. Morcom
May 11, 2017	Research <ul style="list-style-type: none"> a. STAR b. Animal Care c. FiLTER d. Reports from Institutes Graduate Studies	P. Barker R. Einarson

5 May 2017

From: Senate Academic Policy Committee

To: Okanagan Senate

Re: Administration of the Master of Engineering Leadership Resource Engineering Management outside the College of Graduate Studies

Under Okanagan Senate Policy O-4 *Governance of the College of Graduate Studies*, “Senate and the Board may, by resolution, declare the College of Graduate Studies to not be responsible for a graduate course of study and thus have all aspects of that course of study’s administration be the responsibility of its awarding faculty.”

There are a number of Master of Engineering Leadership (MEL) programs on the Vancouver Campus that have been approved as professional programs that are administered by the Faculty of Applied Science and not the Faculty of Graduate and Postdoctoral Studies (as is the norm with graduate programs on that campus). Increasingly on the Vancouver Campus, graduate programs that are of a more practical or professional nature are opting to be administered within the disciplinary faculty. Procedures and processes that govern all aspects of these MEL programs have been developed and are currently in effect for the MEL programs on the Vancouver campus. In the interest of uniformity of all MEL programs (with regards to the student experience in particular) and to help establish the MEL brand, it is essential that the MEL REM program be administered using the same procedures and processes as the other MEL programs. Therefore, the Faculty of Applied Science would like to administer the Master of Engineering Leadership program in Resource Engineering Management (which has been approved on the Okanagan Campus) outside of the College of Graduate Studies.

In doing so, policies related to graduate studies on the UBC Okanagan campus as outlined in the Academic Calendar at the following links will be maintained, with the exception of those statements that grant final authority to the Dean of the College of Graduate Studies. In those cases, final authority will rest with the Dean of the Faculty of Applied Science.

The Senate Academic Policy Committee has reviewed the proposed regulations and recommends the following:

Motion: *“That Senate approve and recommend to the Board of Governors that the Master of Engineering Leadership program in Resource Engineering Management (MEL REM) be administered by the Faculty of Applied Science and outside of the College of Graduate Studies.”*

Respectfully submitted,

Dr. Miriam Grant, Chair, Academic Policy Committee



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

The University of British Columbia
Faculty of Applied Science
School of Engineering
Okanagan Campus
1137 Alumni Avenue
Kelowna, BC Canada V1V 1V7

Phone 250 807 8723
Fax 250 807 9850
www.ubc.ca/okanagan/engineering

April 27, 2017

Okanagan Senate Academic Policy Committee

Dear Committee Members,

Re: Administrative Support Capacity for the MEL in Resource Engineering Management Program

This letter confirms that the Faculty of Applied Science has the capacity for, and is prepared to, provide the administrative support for the MEL in Resource Engineering Management program. This support will be provided through a combination of resources within the Faculty on both the Okanagan and Vancouver campuses. In the attached, you will find a list of administrative services required for the program with the names, positions, and locations of each staff and faculty member who will provide these services.

It is assumed that the number of applicants (and subsequent students) will be small for the first year or two of the program. Consequently, much of the administrative support will be provided by the current Graduate Studies Administrative Assistant in the School of Engineering. As the program grows in size, an additional staff person will be hired by the School of Engineering to support the program.

Thank you for your consideration.

Sincerely,

A handwritten signature in black ink that reads 'Rehan Sadiq'.

Rehan Sadiq, PhD, PEng
Associate Dean, Applied Science

A handwritten signature in blue ink that reads 'Elizabeth Croft'.

Elizabeth Croft, PhD, PEng, FEC, FASME, FCAE
Senior Associate Dean, Applied Science

Administrative Support Capacity for the MEL REM Program will be provided jointly by staff on both the Vancouver and Okanagan campuses as indicated below.

Student Recruitment*Vancouver*

Wendy McHardy, Director of APSC Marketing and Communication

Dr. Sina Schmal, Online Marketing Specialist

Aurore Plavis, Recruitment and Marketing Assistant

Okanagan

Dr. Richard Klukas, MEL REM Director

Admissions*Vancouver*

Helen May, Program Manager, APSC Professional Programs, MEL & MHLP

Evelyn Mah, Program Administrator, APSC Professional Programs, MEL & MHLP

Okanagan

Shannon Hohl, Graduate Studies Administrative Assistant

Dr. Richard Klukas, MEL REM Director

Student Financial Assistance*Vancouver*

Helen May, Program Manager, APSC Professional Programs, MEL & MHLP

Okanagan

Shannon Hohl, Graduate Studies Administrative Assistant

Dr. Richard Klukas, MEL REM Director

Student Progress*Vancouver*

Helen May, Program Manager, APSC Professional Programs, MEL & MHLP

Okanagan

Shannon Hohl, Graduate Studies Administrative Assistant

Dr. Richard Klukas, MEL REM Director

Program Development*Okanagan*

Shannon Hohl, Graduate Studies Administrative Assistant

Dr. Richard Klukas, MEL REM Director

Program Administration*Okanagan*

Shannon Hohl, Graduate Studies Administrative Assistant

Dr. Richard Klukas, MEL REM Director

External and Internal Relations

Okanagan

Dr. Richard Klukas, MEL REM Director

Academic Discipline

Okanagan

Shannon Hohl, Graduate Studies Administrative Assistant

Dr. Richard Klukas, MEL REM Director

Dr. Rehan Sadiq, Associate Dean, Faculty of Applied Science

10 May 2017

From: Senate Academic Policy Committee

To: Okanagan Senate

Re: Materials and Manufacturing Research Institute (MMRI)

The Senate Academic Policy Committee has reviewed the proposal for a new Materials and Mining Research Institute put forward by the School of Engineering (i.e., the Okanagan Division of the Faculty of Applied Science).

The mission of the MMRI is to build on existing strengths of UBC on materials and manufacturing research and create new opportunities for multidisciplinary research in related emerging areas, through shared knowledge and network-based funding. Consultation with the faculties and Librarian of the Okanagan Campus has indicated support for this new research institute.

Therefore, the Senate Academic Policy Committee recommends the following:

Motion: *“That Senate approve and recommend to the Board of Governors the establishment of the Materials and Manufacturing Research Institute within the Okanagan Division of the Faculty of Applied Science as set out in the attached proposal, effective July 1st, 2017.”*

Respectfully submitted,

Dr. Miriam Grant, Chair, Academic Policy Committee



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THE UNIVERSITY OF BRITISH COLUMBIA

Proposal to the UBC Okanagan Senate for the Establishment of:

Materials and Manufacturing Research Institute (MMRI)

Date: February 2017

Submitted by:

Dr. Rehan Sadiq, Associate Dean, School of Engineering
Dr. Abbas S. Milani, Professor & interim Lead for MMRI Initiative, School of Engineering

Background and Rationale:

The University of British Columbia (UBC) has a long standing record of research excellence in different areas of advanced materials and manufacturing at nano, micro, and macro material scales. Pursuant to this excellence, UBC Okanagan researchers in related areas have been successful in attracting significant research funding since the establishment of the campus. In addition, they have established state-of-the-art research laboratories and partnerships with several industrial sectors on both 'core' and 'applied' research areas, including cutting-edge fabrication technologies that were acquired on Okanagan campus through NSERC and CFI grants, WD funding, among others. Witness to this success is the leading role and active involvement of our researchers at the UBC-led networks and facilities such as the Survive and Thrive Applied Research (STAR) and the Composites Research Network (CRN). After series of consultations with a number of researchers on our campus in sub-research areas of materials and manufacturing, it was found that activities of the existing individual laboratories, facilities and research groups are rather isolated, signifying a need to systematically inter-link these activities and create a unique momentum for novel multi-disciplinary collaborative research projects. This potential was also found highly desirable by consulting industry colleagues and delegates from government organizations in the region and Province. As a result, the present proposal for the "Materials and Manufacturing Research Institute (MMRI)" is aimed to creating a 'multi-disciplinary', 'multi-departmental', 'multi-campus' research hub, centrally hosted at UBC's Okanagan campus.

Aligned with the above rationale, MMRI will bring several new joint project and funding opportunities among researchers at both campuses of UBC. Examples of programs to be pursued through such an initiative are the NSERC Discovery Frontiers and Networks of Centres of Excellence, that require a large team of faculty groups from different centres or from an institute to apply for transformative, paradigm-changing research topics that are strategic to Canada. As a more specific example, the recent Discovery Frontiers call-for-proposals entailed "New Materials

for Clean Energy and Energy Efficiency”, which spanned collaborative research between a wide range of disciplines including materials, physics, chemistry, microbiology and engineering. Such inter-disciplinary teams could be well established through MMRI effectively and promptly by combining our researchers’ complementary expertise and addressing challenges in current energy sectors; including the efficiency of alternative and conventional energy systems in wind, solar, nuclear, biomass, natural gas and oil industries.

It is believed that UBC’s Okanagan Campus is currently in an ideal position to initiate and lead such highly interdisciplinary team-based, large projects at both national and international levels. MMRI will directly address this potential by systematically and strategically defining research clusters and bringing new opportunities using an ‘application-based’ strategy (e.g., application of New Materials for Energy Applications, including improving efficiency of wind, solar, nuclear, biomass, natural gas and oil energy systems that are currently of strategic importance to Canada’s economic well-being and the overall sustainability of our high quality of life). More details of the aforementioned ‘application-based’ strategy will be provided in the next sections of this proposal.

Mission:

The mission of MMRI is to build on existing strengths of UBC on materials and manufacturing research and create new opportunities for *multidisciplinary* research in related emerging areas, through shared knowledge and network-based funding.

Vision:

MMRI will be a role model to link ‘core’ and ‘applied’ science and contribute to knowledge advancement in multidisciplinary research areas of advanced materials and manufacturing, through close partnership between faculty at the University of British Columbia and other sectors of academia, industry and government organizations, and by world-class training of students and scientists, and dissemination of high-quality research.

Strategic Goals:

- Build effective interdisciplinary teams to conduct high quality, impactful research in the emerging areas of materials and manufacturing.
- Link to the existing facilities and centres at UBC and facilitate new partnerships to support a network of scholars from academia, industry and government laboratories to share information, opportunities and expertise.
- Secure funding for training and research through new interdisciplinary team-based grant opportunities.
- Enhance UBC’s visibility and reputation nationally and internationally.
- Develop potential for creating new unique workshops and distinguished international speaker series at UBC’s Okanagan campus through interdisciplinary areas of materials and manufacturing.
- Increase community outreach by promoting industry-driven strategic projects and involving community members in different steps of research projects, and by holding frequent networking events.

An ‘Inverse’ (Application-based) Approach to Establishing MMRI:

Today’s research in the areas of advanced materials and manufacturing is all about making value-added products that are smarter, more durable, and more energy-efficient. New materials with improved structural and multi-functional (i.e. mechanical/electrical/chemical/physical/biological) properties are being researched around the world as key enablers for major industrial innovations and for the competitiveness of enterprises across an entire technological spectrum. At the same time, innovations in manufacturing methods are being pursued to enhance products quality through new material processing technologies, while minimizing environmental impact and manufacturing costs. Once integrated optimally, advanced materials and manufacturing research can together significantly contribute to the economic prosperity and social well-being of industrial regions and countries.

A key challenge in the above ‘materials’ and ‘manufacturing’ integration, however, is that the processing technologies and manufacturing standards can vary widely for a given material type and from one target application to another. As an example, the same light and yet very strong fiberglass composite material can and (economically) should be designed and manufactured very differently if it is used in a relatively small mechanical component, versus in a large building structure for earthquake resistance. As another example, the fabrication method and dispersion levels applied during manufacturing of nano-scale electromagnetic devices in biomedical applications can be quite different than those intended for aerospace structures under lightening risk. As such, in order to maximize the efficiency and applicability of materials research projects in the real manufacturing world, it is strongly believed that the structure of a new research institute should be of multidisciplinary nature and based on an ‘application-based’ strategy, rather than the traditionally accepted ‘material-type’ based strategy. Examples of similar new insight and vision in establishing modern institutes can also be seen in other countries (e.g., the Institute of Materials Research, in Japan: http://www.imr.tohoku.ac.jp/en/about/about_org/index.html).

MMRI Structure:

With the above vision and given the existing academic programs and expertise at UBC’s Okanagan campus, five main divisions (application areas) are sought in the proposed institute. These areas can be augmented over time as more areas emerge on campus. The areas include: 1) Aerospace and Transportation Materials and Manufacturing (ATMM), 2) Building and Construction Materials and Manufacturing (BCMM), 3) Biomedical and Biological Materials and Manufacturing (BBMM), 4) Polymer and Natural Materials and Manufacturing (PNMM), and 5) Electromagnetic and Nanoscale Materials and Manufacturing (ENMM).

The structure of the institute with its five primary divisions (research clusters) is provided in Figure 1. At UBC, other materials/manufacturing related centres and facilitates are considered as internal collaborating members, while organizations outside the university are noted as external members. Each division will have a Lead who will be in charge of organization and industry liaison in that particular division, while working closely with other Leads and the Management team on a regular basis to promote inter-disciplinary project ideas. The institute Associate Directors will manage the inter-connection of divisions (Figure 2) as well as respective external outreach activities to promote and assist in different joint funding opportunities. The Director will be in charge of daily management of the institute, major administrative matters, and ensure full synergy and

collaborative research momentum *within* and *between* the institute divisions and collaborating organizations. The management team will meet quarterly to discuss and define the main strategic directions of MMRI research activities based on emerging opportunities and to review the performance of the divisions as a whole.

The membership of individuals and organizations in the institute are proposed based on the following definitions:

- Core member: directly involve in the research projects/co-supervise students/write the main part of grants; UBC faculty would be normally under this category.
- Associate member: partly/indirectly involve in the research projects/ co-supervise students/write a part of grant or provide support; e.g., faculty from other universities or government research laboratories would be normally under this category.
- Collaborating organization/company: Provide close support for the ongoing projects/grants but not necessary involve in all details of project phases, grants, etc. A collaborating company/organization (e.g., a SME) is encouraged but does not have to have an Associate Member in the institute.

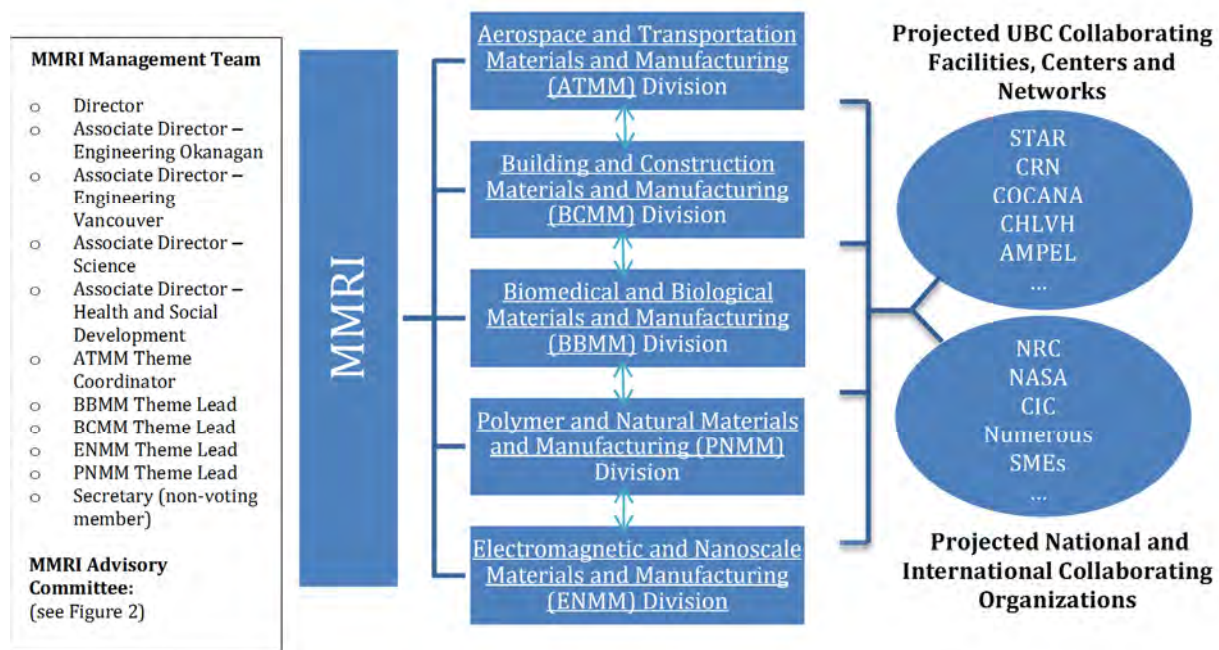


Figure 1: Structure of MMRI and its divisions.

Divisions activities, facilities and their interactions:

Figure 3 summarizes the top research priorities within each division, initially solicited based on current strengths and interests of the members (Table 1); however new areas in each division are expected as the multi-disciplinary projects are formed and advanced. Below is also a description of anticipated activities of each division, including its *interaction* with other divisions, along with existing research facilities and infrastructure. Example of expected Knowledge Translation from one division to another, along with potential collaboration with other existing centres and institutes at UBC and the associated industry partners is shown in Figure 4.

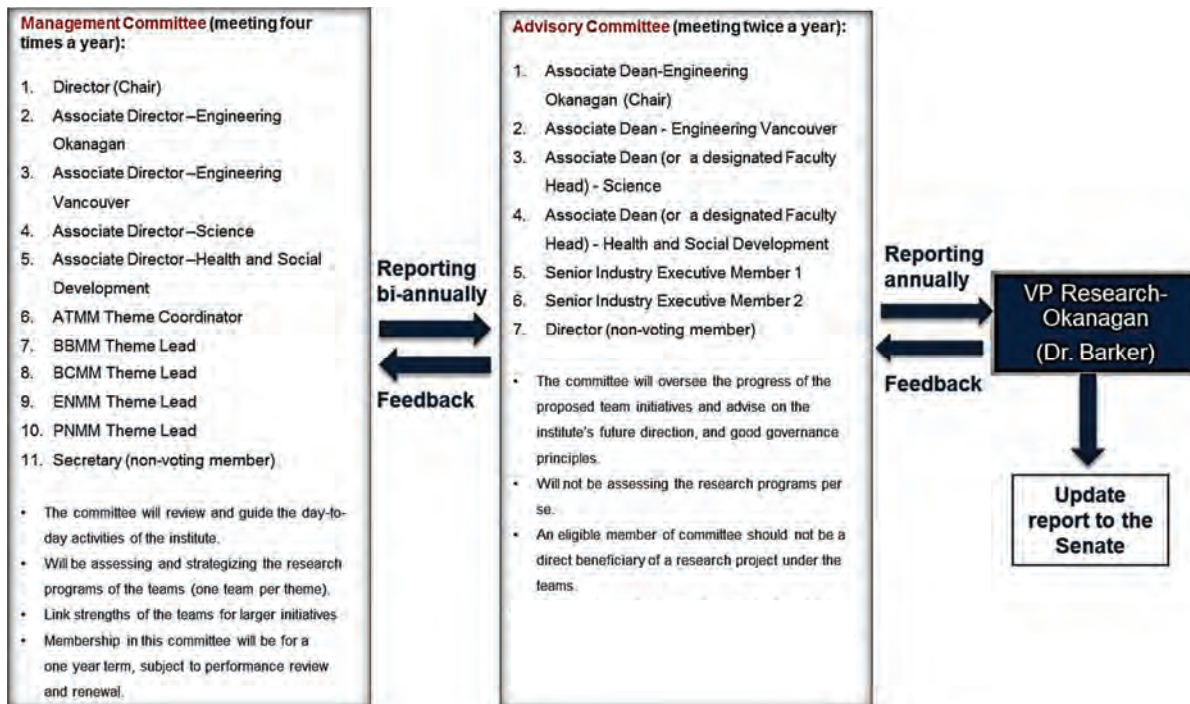


Figure 2: Reporting and inter-management structure of MMRI.

Application-based Themes:

	# Members signed up (internal and external)	#Funding record	
<ul style="list-style-type: none"> • Multi-scale, multi-physics material and process modelling • Structural health monitoring • Automation, control, and vibrations • Additive Manufacturing • Lightweight alloys and composite materials (through direct collaboration with AMGM and CRN). 			Aerospace and Transportation Materials and Manufacturing (ATMM)
<ul style="list-style-type: none"> • Cement, Concrete, Timber, FRP Structures • Engineered cementitious composite • Green roof design and manufacturing • Life-cycle analysis • Geotextiles 	15	\$5M	Building and Construction Materials and Manufacturing (BCMM)
<ul style="list-style-type: none"> • Cardiovascular engineering and technology • Design and manufacturing of the next generation of prosthetic heart valves • Hemodynamics and Computational Fluid Dynamics • Surgical simulation • Bio-robotics/Bio MEMs/NEMs 	30	\$6M	Biomedical and Biological Materials and Manufacturing (BBMM)
<ul style="list-style-type: none"> • Polymer nanomechanics and nanochemistry • Organometallic polymer catalysts • Atomistic modeling of material properties • Nanocrystalline cellulose • Controlled radical polymerization 	18	\$18M	Polymer and Natural Materials and Manufacturing (PNMM)
<ul style="list-style-type: none"> • Smart windows • Radiation therapy • Raman and terahertz spectroscopy • Wireless power transfer applications • Metamaterials and nano-manufacturing 	21	\$5M	Electromagnetic and Nanoscale Materials and Manufacturing (ENMM)

Figure 3: Priority areas identified under each division (research cluster).

Table 1: Summary of current memberships under multi-disciplinary pillars of MMRI (for CVs please see the Appendix; multiple SME collaborating members have been excluded in this table)

Unit/Faculty	ATMM	BCMM	BBMM	PNMM	ENMM	
School of Engineering	6	4	3	2	6	15
Irving K Barber School of Arts and Science	1	1	4	7	5	18
Faculty of Medicine & Faculty of Health and Social Development			5			5
UBC Vancouver	3	2	7	2	3	17
External to UBC (universities, government organizations, hospitals)	6	8	11	7	7	39
Total	10	15	30	18	21	94

ATMM:

The Aerospace and Transportation Materials and Manufacturing (ATMM) division will bring together faculty and student researchers, and industry, to work collaboratively on developing innovative solutions to real-world materials and manufacturing issues in leading aerospace, automotive, and rail industries. Primarily, through existing collaborations and industrial contacts, the division will establish a critical mass of research in areas of global interest such as Additive Manufacturing, Automation and Control, Lightweight Engineering Materials, Smart Materials, and Through-process Modelling. As reflected in their individual CVs, the founding (core) members of ATMM have a long history of research excellence in developing, testing, characterizing, and modelling materials for structure-property relationships, and for modelling, simulating and optimizing processes to improve manufacturing process quality. Evidence of this success is found in the more than 200 journal articles that have been published over the past ten years, with a significant record of attracting governmental and industrial funding for research. ATMM will also work closely with other divisions of the institute and industry sectors to establish joint efforts on design and fabrication of emerging “multi-functional” materials in a wide range of applications. As an example, aircraft composite wings are required to have high specific strengths but at the same time possess sufficient protection against electromagnetic activity like electromagnetic pulse (EMP) or lightening events. The next generation of such structures could incorporate carbon nano-tubes into the current sandwich laminates used to fabricate the wings to meet this multi-functional performance requirement. As another example, different car manufactures are at the stage of incorporating natural fiber composites into the car bodies; however inter-disciplinary research is needed to arrive at optimum chemical composition of thermoplastic resins that can accommodate such natural materials next to carbon fibers, while minimizing defects such as voids, wrinkling, and fiber-matrix de-bonding during processing. ATMM is also expected to contribute notably within the institute in training of graduate students, as well as developing short courses for industry

on topics related to advanced materials and manufacturing. This division is planning to submit an application for a NSERC CREATE training grant in the near future.

The initial infrastructure for the ATMM will initially come from within the research groups of the founding members. Examples include advanced instruments and facilities for fabricating materials such as the Spark Plasma Sintering laboratory for additive manufacturing (Dr. Bichler), and the Composites Laboratory (Dr. Milani), for characterizing materials such as the PIV Lab for advanced electronic cooling (Dr. Li), the Facility for 3D x-ray tomographic imaging (Drs. Milani and Phillion) and the Facility for scanning-electron microscopy, and for control of manufacturing processes such as an Actuators Lab (Dr. Seethaler). There is also a wide range of basic equipment to characterize the physical and mechanical properties of materials, as well as a full machine shop for sample preparation.

BCMM:

The BCMM division will bring together a diverse collection of professors, student researchers, collaborators, and industrial partners broadly engaged in the advancement of cement, concrete, fiber reinforced plastic, timber and steel. The research themes of this division include: construction materials related to buildings, their strength and durability performance in short term and long term, recycling and reusing of by-products, manufacturing process, and utilization of nanotechnology in materials. The members of this division have established a distinguished record of research excellence in the development and application of novel technologies in construction materials and recycling and reusing of industrial wastes in the development of new materials for construction. Research results have been published in the most prestigious academic journals, including Smart Materials and Structures, Journal of Materials in Civil Engineering, Construction and Building Materials, Geotechnique, ACI Structural Journal, Clean Technologies and Environmental Policy. There are already synergistic collaborations amongst the members of this division. For example, Dr. Alam and Dr. Hewage are working on durability and performance assessment of timber poles for Fortis BC. Dr. Alam and Dr. Rteil have worked on the possible use of shape memory alloy rebar and FRP rebar for building construction. Dr. Siddiqua and Dr. Alam have worked on an NSERC RTI research proposal for purchasing a freeze-thaw durability chamber. The BCMM division will help further catalyze collaborative initiatives amongst its members, including collaborative research projects, joint course offerings, group applications for training grants such as NSERC CREATE.

Infrastructure for the BCMM division includes cement and concrete mixer, aggregate sieve shaker, high capacity tensile and compressive testers, fatigue testing machine, data acquisition system and sensors, various non-destructive testing units, and tri-axial test unit in Dr. Alam's NDT lab, Dr. Sumi's Geotechnical lab, Dr. Hare's lab at COCANA. There is also a diverse range of finite element simulation tools for modelling different type of structural materials.

BBMM:

The proposed BBMM provides an opportunity that the knowledge and expertise in the areas of biomedical engineering are brought together. Combining engineering and medicine, this division will pioneer new technologies and methodologies in order to address human-health issues. As the physical, chemical, mathematical and computational sciences merge with biology, medicine,

behavior and health, the results are new materials, devices and processes that prevent, diagnose and treat diseases and injuries. The main groups of the proposed BBMM include biomechanics, biomaterials and biochemical engineering, medical imaging, robotics, and BioMicroSystems. The BBMM is basically to promote the accommodating involvement of clinical and basic researchers in applied disciplines such as biomechanics, biomaterials and imaging. This division inspires multidisciplinary linkages between the faculties of Engineering, Medicine, Kelowna General Hospital, etc. We intend to equip our science and engineering students with a solid training in biomedical engineering and its application to biomedical engineering health-related problems. We intend to carry out innovative research at the leading edge of knowledge in the area of biomedical science and engineering. In the early years, the focus of research will be towards computational and theoretical biomechanics, medical devices, and cellular and tissue mechanobiology. As this research cluster develops in future years, research will expand into emerging fields such as bioinspired materials, biosensors and robotics.

The context for the BBMM at the University of British Columbia is rooted in the existence of many interdisciplinary teams which could be potentially engaged in biomedical engineering health-related research. The proposed division in MMRI has the potential to span institutional and departmental boundaries and combine diverse expertise to focus on common research problems and educational objectives. A broad range of interdisciplinary collaborations will be brought together in several laboratories across campus, in the Faculty of Applied Science, School of Engineering, Faculty of Science, Faculty of Medicine and Dentistry's clinical departments and Kelowna General Hospital.

The initial infrastructure for the BBMM will readily come from within the research groups of the founding members. Examples include advanced instruments and facilities for fabricating hydrogel-based biomaterials available at the Heart Valve Performance Laboratory (HVPL) (Drs. Kim and Mohammadi) and Echocardiography laboratory at the Kelowna General Hospital (Dr. Fradet).

PNMM:

The PNMM division will bring together faculty and student researchers to work collaboratively on developing innovative solutions to real-world materials and manufacturing issues in leading industries where biodegradable and natural materials can find functionality. Primarily, through existing collaborations and industrial contacts, the division will establish a critical mass of research in broad themes: Polymer/natural materials derived from plant sources, modeling physical properties and functionality of the components of materials, catalysts that can be used to generate new polymers, and susceptibility of polymer materials to damage (e.g. by exposure to radiation). As reflected in their individual CVs, the founding (core) members of PNMM have a long history of research excellence in developing, characterizing, and modelling materials for structure-property relationships. Evidence of this success is found in the 405 journal articles that have been published over the past ten years, with a significant research funding record. PNMM will also work closely with other divisions of the institute and industry sectors to establish joint efforts on design and fabrication of emerging "multi-functional" materials in a wide range of applications. PNMM is also expected to contribute notably at the institute to training opportunities in inter-disciplinary areas of materials and manufacturing, including participation in major training grants such as NSERC CREATE and initiating joint graduate courses with other divisions.

The initial infrastructure for the PNMM will readily come from within the research groups of the founding members. Examples include advanced gas chromatogram - mass spectrometer instruments and plant growth chambers (Dr. Murch), chemical synthesis facilities (Dr. Smith), high-performance computing (Dr. DiLabio/Compute Canada), and confocal microscopy (Dr. Li). Furthermore, the division house large collections of varieties of plants, including breadfruit, from which natural polymers can be easily extracted.

ENMM:

The ENMM division will bring together a diverse collection of professors, student researchers, collaborators, and industrial partners broadly engaged in the advancement of electromagnetic materials and nanotechnology. The research themes of this division include: Optics and Photonics, Wireless Technology, Micro- and Nano- Electromechanical Systems, Spectroscopy, and Nanoscale Phenomena. The members of this division have established a distinguished record of research excellence in the application of electromagnetic waves for material interrogation, fabrication of novel materials and metamaterials for manipulation of electromagnetic waves, and fundamental examination of nanoscale material phenomena. Research results have been published in the most prestigious academic journals, including Nature, Nature Communications, Physical Review Letters, Reports on Progress in Physics, Applied Physics Letters, Physical Review B, Optics Express, Journal of Applied Physics, Lab on a Chip, and various IEEE journals. There are already synergistic collaborations amongst the members of this division. For example, Dr. Holzman, Dr. Chau, and Dr. Jirasek are working with the BC Cancer Agency to develop novel lab-on-a-chip platforms for performing Raman and terahertz spectroscopy on living cells. As another example, Dr. Johnson and Dr. Bobowski have been collaborating on the development of a non-contact voltage sensor to monitor and track the performance of the electrical grid. The ENMM division will help further catalyze collaborative initiatives amongst its members, including collaborative research projects, joint course offerings, group applications for training grants such as NSERC CREATE.

Infrastructure for the ENMM division includes advanced nanofabrication capabilities available in the Applied Micro- and Nano-Fabrication Facility, laser systems and optical components in Dr. Holzman's Integrated Optics Laboratory, Dr. Chau's Applied Electromagnetic Laboratory, and Dr. Jirasek's Medical Physics Laboratory, microwave and radio frequency equipment in Dr. Johnson's Microwave Technology Laboratory, and microstructure characterization using a scanning electron microscope and a suite of optical microscopes. There is also a diverse range of simulation tools for modelling electromagnetic and nanoscale phenomena.

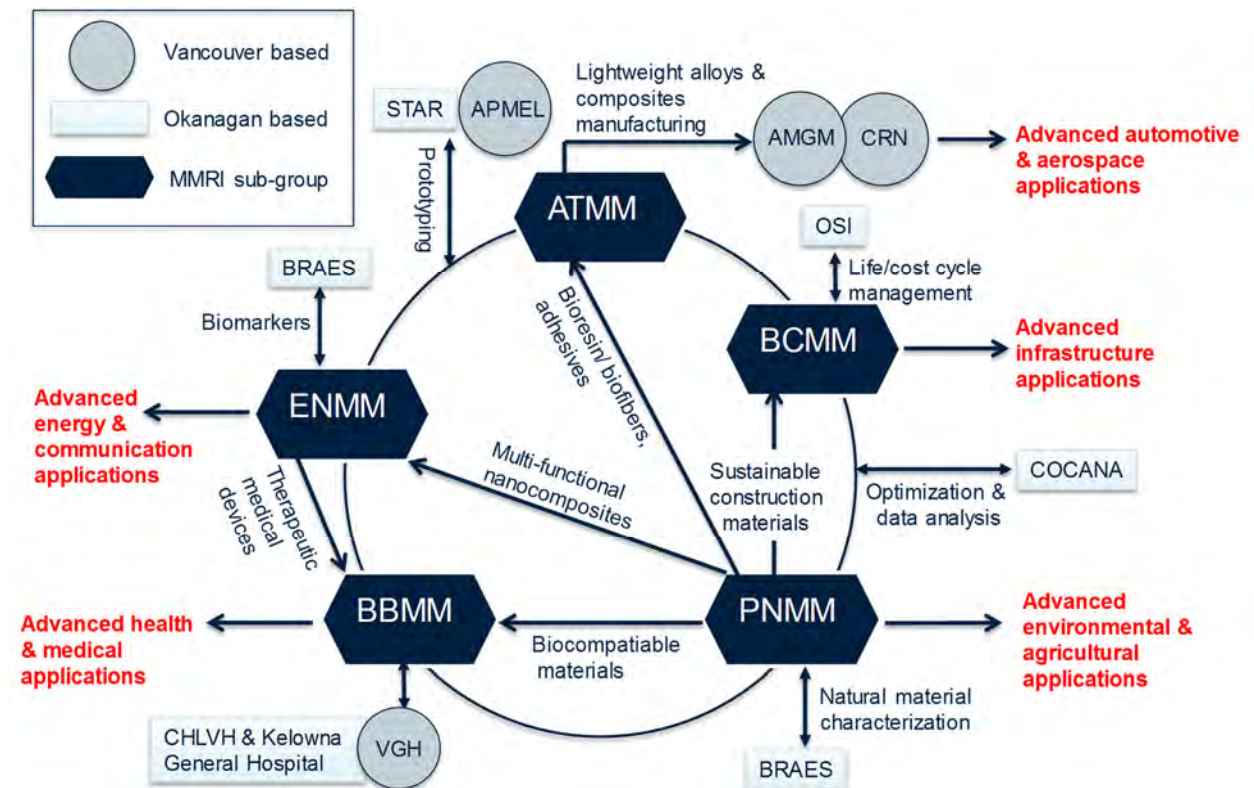


Figure 4: Overview of anticipated knowledge translation between institute divisions and their interactions with other UBC Institutes/Centres as well as industry sectors.

MMRI Funding:

To ensure effectiveness and acceleration of activities of MMRI, funding for a full-time Research Associate (at least with a Master's degree in Engineering or Science) is considered at a salary of approximately \$75,000/year including benefits. Hiring a part-time Administrative Assistant at the total Salary of about \$40,000/year is also anticipated (Table 2). The Research Associate will directly assist the management team in planning collaborative projects between faculty members, grant writing, procurement, as well as organizing visiting speaker and workshop sessions, liaising with local and national industries, as well as communication with other lab technicians regarding maintenance of laboratories and training of students for specialized/sensitive equipment. He/she will also cooperate with the institute's Administrative Assistant who will be responsible for grant administration, day-to-day administrative aspects (communications, invitation letters, student hires, etc), and website updating. In addition, for the central management of the institute a \$10,000 contribution per year is projected. The central budget may also be used to e.g. invite known international speakers.

Moreover, to encourage multi-disciplinary project efforts from the very onset of the institute operation, negotiations have been under way with a Government Sector, and a budget of \$500,000 is being allocated as seed funding to launch a set of ~20 projects per year along with multiple industry-university workshops, between April 2017 to March 2019. In subsequent years, further external funding is expected through both general applications on behalf of the institute and those

brought by research divisions under their research grants. The total annual budget request over the next three years through UBC support is \$125,000.

Table 2: Summary of budget outlook for the first three years of MMRI operation

Item	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)
	Internal UBC support (40% Office of Research Services; 40%: APSC Dean's Office; 20% School of Engineering)		
Research Associate and Administrative Assistant Salaries	\$115,000	\$115,000	\$115,000
Central Management	\$10,000	\$10,000	\$10,000
Total	\$125,000	\$125,000	\$125,000
	Additional external support (Government grant under final review)		
To initiate ~30/year multi-disciplinary projects among UBC faculty and industry & perform R&D workshops	\$500,000 (2017-2019)		

Expected Outcome:

The proposed institute is expected to offer many significant benefits to its stakeholders as follows:

1. UBC: MMRI will directly address the UBC Strategic Plan to foster research excellence and knowledge exchange, which will also result in long-term benefits including sustained and significant research impact, attraction and retention of the best minds, and relevance on local and global scales. The institute is expected to be one of the first in its kind in Canada to link core and applied research in the materials and manufacturing research, with participating faculties from Physics, Chemistry, Engineering, Biology, Applied Mathematics, Health and Exercise Science, Faculty of Medicine, Computer Science, Statistics and Optimization, among others.
2. UBC Okanagan: it will increase visibility of an emerging area of research excellence at UBC, support recruitment of top students and build on the growing reputation of the Okanagan campus as a place for cutting-edge interdisciplinary research that is both locally and globally relevant. In addition, over time, as different divisions of MMRI pursue joint research projects, new graduate courses and eventually graduate programs can be developed; e.g., an inter-disciplinary program on Biomedical Science & Engineering with student theses being linked to STAR-driven industry projects.
3. Faculty: It will increase chances of research funding success through support of team-based applications, more opportunities for collaboration with industry and other faculty members, and access to a larger pool of highly qualified students due to increased visibility.

4. Industry: It will benefit SMEs as well as high-tech industries by providing greater accessibility to a group of faculty members and students in a broad range of materials and manufacturing applications. Students trained in the institute will be top science and engineering graduates, possessing a wide range of practical and analytical skills useful for high-tech employment, or entrepreneurship.

5. Community: The institute will unite the emerging talent at UBC Okanagan in the field of advanced materials and manufacturing which will then raise the profile of the campus as a place for high-tech research and innovation, support on-going efforts of local organizations such as Accelerate Okanagan aiming to increase the number and- success of technology companies in the region, and catalyze local high-technology creation and spin-off companies.

A summary of expected benefits from MMRI has been presented in Figure 5.

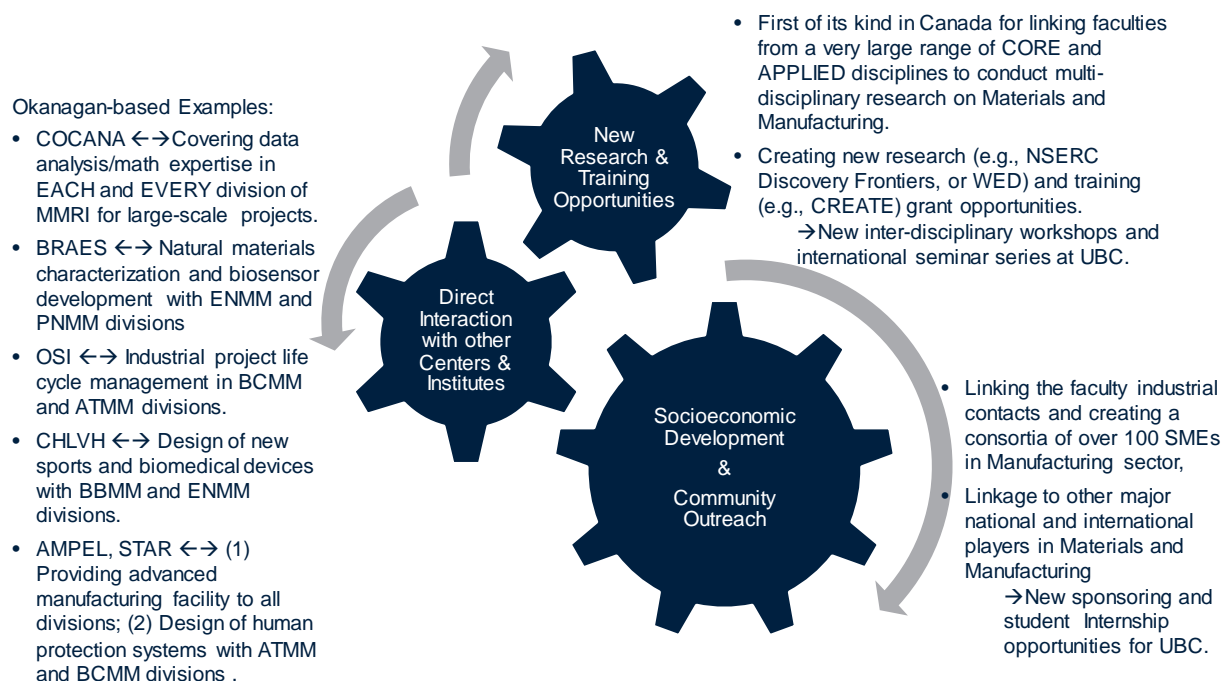


Figure 5: Expected benefits by MMRI

APPENDIX note: The following Appendix includes information on registered members under each division (the lists in progress), along with summary of their background and strengths, as well sample support letters received under each division from industries.

ATMM Division

Projected research areas (please list the in bullet form; maximum of 10)

- Additive Manufacturing
- Automation and control for automotive applications
- Defect characterization of engineering materials via 3D X-ray imaging
- Multi-phase flow: applications and fundamentals
- Material joining/welding techniques
- Mathematical modelling (FEA/CFD) of manufacturing processes
- Multi-scale modelling of structure-processing-properties relationships
- Structural health monitoring of processes and structures
- Thermo-chemo-mechanical characterization of lightweight alloys and composite materials
- Thermal management and cooling technologies for power electronics

At UBC Okanagan (Vancouver members of all divisions are listed in a separate document):

Name	Department	Laboratory	Top Three Areas of Expertise
Lukas Bichler	School of Engineering	Spark Plasma Sintering Laboratory AND Metalcasting Laboratory for non-ferrous alloys	Magnesium and Aluminum alloys, High temperature ceramics for thermal barrier applications, Metal matrix composites
Sunny Li	School of Engineering	Electronics Cooling and Multiphase Flows Lab	Heat transfer, Fluid mechanics
Jason Loeppky*	Irving K Barber School of Arts and Science	Statistics	Design and analysis of experiments for both physical processes and numerical simulation models; applications include environmental and industrial statistics
Abbas Milani	School of Engineering	Composites Research Network-Okanagan	Composite Materials, Manufacturing, Multi-Criteria Process Optimization
Andre Phillion	School of Engineering UBC, and Faculty of Engineering at McMaster.	Solidification Processing and Simulation Laboratory	3D Materials Science, Modelling of Material Processes and Defects
Rudolph Seethaler	School of Engineering	Control and Automation Laboratory	Smart Materials, Structural Health Monitoring, Controls
Joshua Brinkerhoff	School of Engineering	CFD	Fluid instability and turbulence, Computational fluid dynamics, Aeronautics

*The asterisk indicates Associate Member (no CV submission required at this point)

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Brian L. Wardle	Department of Aeronautics and Astronautics, MIT	Necstlab; and Nano-Engineered Composite Aerospace Structures Consortium	Hybrid nanocomposite systems; MEMS power devices and energy harvesting; Structural health monitoring systems
Paul Cavallaro	Naval Undersea Warfare Center	Mechanics of Advanced Structures & Materials	High performance materials, Characterization and FE modeling, impact and ballistics
Paul A Lagace	Department of Aeronautics and Astronautics, MIT	Technology Laboratory for Advanced Materials and Structures	Damage Tolerance; Manufacturing; Composite Structures
David Trudel-Boucher	National Research Council Canada	Industrial Materials Institute	Automotive materials, Multi-scale characterization, Forming processes
Cara A.C. Leckey	NASA Langley Research Center	Nondestructive Evaluation Sciences Branch	Non-destructive testing methods; Structural Health Monitoring; Multi-physics modeling
Steven M. Arnold	NASA Glenn Research Center at Lewis Field	Materials and Structures Division	Multi-scale simulation of advanced structures; Damage modeling; Advanced materials testing

Summary of funding:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
>\$5,000,000	>\$4,000,000	>\$3,000,000	>\$500,000

Summary of training record:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/ Visiting Scholar	Undergraduate Research Assistant
7	25	49	9	53

Summary of publications record:

Books/Chapters/ Editorials	Journal Articles	Conference Proceedings	Abstracts/ Posters	Patents	Technical Reports
20	220	183	55	6	30

Anticipated activities including interaction with other divisions of the Institute, and sample facilities/ research infrastructure

Anticipated activities: The Aerospace and Transportation Materials and Manufacturing (ATMM) division will bring together faculty and student researchers, and industry, to work collaboratively on developing innovative solutions to real-world materials and manufacturing issues in leading aerospace, automotive, and rail industries. Primarily, through existing collaborations and industrial contacts, the division will establish a critical mass of research in five broad themes: Additive Manufacturing, Automation and Control, Lightweight Engineering Materials, Smart Materials, and Through-process Modelling. As reflected in their individual CVs, the founding (core) members of ATMM have a long history of research excellence in developing, testing, characterizing, and modelling materials for structure-property relationships, and for modelling, simulating and optimizing processes to improve manufacturing process quality. Evidence of this success is found in the more than 200 journal articles that have been published over the past ten years, with a significant record of attracting governmental and industrial funding for research. ATMM will also work closely with other divisions of the institute and industry sectors to establish joint efforts on design and fabrication of emerging “multi-functional” materials in a wide range of applications. As an example, aircraft composite wings are required to have high specific strengths but at the same time possess sufficient protection against electromagnetic activity like electromagnetic pulse (EMP) or lightening events. The next generation of such structures could incorporate carbon nano-tubes into the current sandwich laminates used to fabricate the wings to meet this multi-functional performance requirement. As another example, different car manufactures are at the stage of incorporating natural fiber composites into the car bodies; however inter-disciplinary research is needed to arrive at optimum chemical composition of thermoplastic resins that can accommodate such new natural materials next to carbon fibers, while minimizing defects such as voids, wrinkling, and fiber-matrix de-bonding during processing. ATMM is also expected to contribute notably within the institute in training of graduate students, as well as developing short courses for industry on topics related to advanced materials and manufacturing. This division will submit an application for a NSERC CREATE training grant in the near future.

Infrastructure: The initial infrastructure for the ATMM will readily come from within the research groups of the founding members. Examples include advanced instruments and facilities for fabricating materials such as the Spark Plasma Sintering laboratory for additive manufacturing (Dr. Bichler), and the Composites Laboratory (Dr. Milani), for characterizing materials such as the PIV Lab for advanced electronic cooling (Dr. Li), the Facility for 3D x-ray tomographic imaging (Dr. Phillion) and the Facility for scanning-electron microscopy (Dr. Yannacopoulos), and for control of manufacturing processes such as an Actuators Lab (Dr. Seethaler). There is also a wide range of basic equipment to characterize the physical and mechanical properties of materials, as well as a full machine shop for sample preparation.

Biography of the Division Lead (acting)

Dr. Phillion received his PhD from the Department of Materials Engineering, The University of British Columbia, where he combined high temperature experimental methods with multiscale modelling to investigate solidification processes and defect formation. After completing his PhD research, he spent two years at the LSMX Computational Materials Laboratory, EPF-Lausanne, Switzerland, as an NSERC Post-doctoral fellow. Dr. Phillion has been with the School of Engineering at UBC's Okanagan Campus 2010-2016. Recently he moved to McMaster University and is an Associate Member of the School at UBC Okanagan with multiple collaborative projects.

Dr. Phillion's research interests are in the areas of advanced solidification processes for light metal alloys, numerical process/microstructure/defect modeling, and microscopy. The main focus of the research has been to investigate the relationships between solidification at the macro-scale with the development of microstructure and defects in order to improve the properties of light metal alloys. This research responds directly to the current critical need for new technologies and novel processing routes to improve mechanical properties, and to reduce processing defects enabling new high-strength/light-weight components to be economically produced. Another area of interest is 3D materials science, which Dr. Phillion introduced to the UBC Okanagan campus community in 2010. The research in this area has included the use of X-ray micro-tomographic imaging and subsequent modeling to characterize 3D aspects of phase morphology, phase selection and defects during solidification, percolation of fibrous papermaking networks, permeability in gas diffusion layers of fuel cells, and structure degradation of lung tissue due to smoking in collaboration with colleagues from Chemical Engineering, Health Sciences, and Earth and Environmental Sciences.

If Dr. Phillion is not in his office or lab, you can generally find him exploring the outdoors, either cycling, skiing, hiking, or sailing.

CV for ATMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Andre Phillion	University of British Columbia, School of Engineering	Solidification Processing and Simulation Laboratory	3D Materials Science Mathematical Modelling of Solidification Processes and Defects

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
4	47	22	23	0	5

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

A.B. Phillion, "Recent Experimental and Numerical Developments in Semisolid Deformation," JOM, Vol.66(8), pp:1406-1407, 2014.

b) Journals

Y. Sharma, A.B. Phillion, D.M. Martinez, "Automated segmentation of wood fibres in micro CT images of paper," Journal of Microscopy, In Press, 2015.

H.R. Zareie Rajani and A.B. Phillion, "A meso-scale simulation of solidification in Aluminum alloy fusion welding," Acta Materialia, Vol.77, pp:162-172, 2014.

M. Sistaninia, A.B. Phillion, J.-M. Drezet, and M. Rappaz, "A 3D coupled hydro-mechanical granular model for constitutive behavior of metallic alloys during solidification," Acta Materialia, Vol.60, pp:6793-6803, 2012.

J.-M. Drezet (50%) and A.B. Phillion, "As-cast residual stresses in an aluminum alloy AA6063 billet: neutron diffraction measurements and finite element modelling," Metallurgical and Materials Transactions, Vol.41, pp:3396-3404, 2010.

Past and current HQP training history (2005-2015)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/ Visiting Scholar	Undergraduate Research Assistant
4	7	9	3	9

Details:

Student Name	Type	Years	Supervisor(s)
Maziar Shah Mohammadi	PDF	2014	A.B. Phillion
Mohamadreza Nourani	PDF	2013-2014	A.B. Phillion
Morteza Amoorezaei	PDF	2013	D.M. Maijer, A.B. Phillion
Ehsan Khajeh	PDF	2011	A.B. Phillion
Farzin Golkhosh	PhD	2015	A.B. Phillion
Saibal Modak	PhD	2014	A.B. Phillion
Fariba Jaber	PhD	2012	A.B. Phillion
Pan Fan	PhD	2012	S.L. Cockcroft, A.B. Phillion
Hamid Zareie	PhD	2011	A.B. Phillion
Pooya Khatibi	PhD	2009-2014	H. Henein, A.B. Phillion
Meisam Sistaninia	PhD	2008-2010	M. Rappaz, A.B. Phillion, J.-M. Drezet
Amitvikram Dutta	MASc	2015-present	J. Brinkerhoff, A.B. Phillion
Ambrish Sinha	MASc	2014-present	A.B. Phillion
Sadegh Hasanpour	MASc	2014-present	A.B. Phillion, M. Hoorfar
Meaghan Ormrod	MASc	2014-present	A.B. Phillion, S. Yannacopoulos
Mohammad Mohseni	MASc	2013-2015	A.B. Phillion, D.M. Maijer
Majid Targhagh	MASc	2013-present	A.B. Phillion
Yash Sharma	MASc	2012-2014	A.B. Phillion, M. Martinez
Pouyan Jahangiri	MASc	2011-2013	M. Martinez, J.A. Olson, A.B. Phillion
Nasim Jamaly	MASc	2010-2012	A.B. Phillion
Carl Reilly	Research Associate	2011-present	S.L. Cockcroft, D.M. Maijer, A.B. Phillion
Ruifeng Dou	Visiting Scholar	2015	A.B. Phillion
Jiao-Jiao Wang	Visiting Scholar	2012-2013	A.B. Phillion

Kaitlin Carson	Undergrad	2015	A.B. Phillion
Stephanie Hale	Undergrad	2014	A.B. Phillion
Rubal Heer	Undergrad	2013	A.B. Phillion
Aviral Vaid	Undergrad	2013	A.B. Phillion
Silvia Odaya	Undergrad	2013	A.B. Phillion
Camille Chabaro	Undergrad	2012	A.B. Phillion
Hudson Turnbull	Undergrad	2012	A.B. Phillion
Ryan Brabander	Undergrad	2011	A.B. Phillion
Cole Grayston	Undergrad	2010	A.B. Phillion

Research funding (2005-2015)

Contribution Summary (for group applications, only the portion applied to the author is reported in this table):

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$1,284,440	\$1,027,847	\$99,583	\$19,000

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
NSERC CRD with Canfor Pulp Ltd Partnership	Insight into property development of LC-refined NBSK and its mixtures	\$719,061.00	2015-2018	D.M. Martinez	A.B. Phillion, J.A. Olson
POSCO	High Temperature Cracking in Continuous Cast Steel	\$15,000.00	2015	S.L. Cockcroft	D.M. Maijer, A.B. Phillion
NSERC RTI	An in-situ mechanical testing stage for high-resolution X-ray Computed Tomography applications	\$115,290.00	2015	A.B. Phillion	10 others
Mitacs Accelerate with BC Oil&Gas Commission, Secure Energy Services, and X1 Aeronautics	British Columbia Natural Gas Strategic Research Initiative	\$255,334.00	2015-2016	D. Tannant	A.B. Phillion and 5 others

Canadian Autoparts Toyota	Next Generation Water-cooled Low-pressure Die for the Production of Automotive Wheels (APC extension)	\$60,000.00	2015	S.L. Cockcroft	D.M. Maijer, A.B. Phillion
School of Engineering (Research Tools Grant)	Software to calculate permeability in tomography images	\$10,200.00	2015	A.B. Phillion	S. Siddiqua
NSERC (Engage) with Northside Industries	Fatigue performance of quick-fill fuel tanks for oil&gas applications	\$25,000.00	2015	A.B. Phillion	
NSERC (Engage) with Prised Solar	Solar cell silicon: Numerical simulation of casting methods and defects	\$25,000.00	2014	A.B. Phillion	
Auto21 NCE	Enhanced Powertrain Components Through Application of Advanced Chill Technologies – Year 3 Program Extension	\$15,300.00	2014	A.B. Phillion	
School of Engineering (Research Tools Grant)	A Mass Flow Control system for TG/DSC	\$6,000.00	2014	A.B. Phillion	
NSERC (Engage) with Ramsden Industries	Hot Tearing Behaviour of Aluminum Alloy B206 During Permanent Mould Casting	\$25,000.00	2013	A.B. Phillion	
NSERC (Strategic)	Through-Process Modelling: Castings for Marine Energy Systems	\$511,100.00	2012-2016	D.M. Maijer	A.B. Phillion, E. Asselin
NSERC (CRD) with EKA Chemicals	Pressure Filtration of a Non-Newtonian Fluid From a Soft Porous-Fibre Suspensions	\$115,000.00	2013-2015	D.M. Martinez	A.B. Phillion, J.A. Olson
UBC Okanagan (Provost's Seed Funding)	Investigation of Small Airway Disease via High Resolution Computed Tomography	\$12,000.00	2013-2014	A.B. Phillion	J. Hogg
School of Engineering (Research Tools Grant)	Automated Welding Apparatus for Applications relating to Light Metals	\$4,765.00	2013	A.B. Phillion	
NSERC (Interaction)	Castability of High-Strength Al Alloys	\$3,614.00	2012	A.B. Phillion	D.M. Maijer
UBC Okanagan Faculty Travel Grant	3D meso-scale modeling of Al alloy welding processes for prediction of hot cracks	\$2,000.00	2013	A.B. Phillion	
NSERC RTI	A Test System for Dynamic Mechanical Thermal Analysis of Composites and Lightweight Alloys	\$112,900.00	2012	A. Milani	A.B. Phillion, L. Bichler
Auto21 NCE	Enhanced Powertrain Components Through Application of Advanced Chill	\$34,000.00	2012-2013	A.B. Phillion	

	Technologies				
NSERC CRD with Canfor Pulp Ltd Partnership	Three-Dimensional Structure & Strength Characterization of Canfor NBSK Pulp	\$173,550.00	2012-2015	A.B. Phillion	M. Martinez
Automotive Partnership Canada with Canadian Autoparts Toyota	Next Generation Water-cooled Low-pressure Die for the Production of Automotive Wheels	\$1,175,630.00	2011-2013	S.L. Cockcroft	D.M. Maijer, A.B. Phillion
NSERC RTI	A DSC/TG thermal analysis system for measurement of material properties in metallic alloy systems	\$68,278.00	2011	A.B. Phillion	L. Bichler, S. Yannacopoulos
UBC Okanagan (Internal Grant)	Microstructure Morphology of Al Alloys during Solidification	\$5,000.00	2011	A.B. Phillion	
Western Economic Diversification Canada with Charles Fipke Foundation	A Micro-Fabrication and Analysis Facility for High-Technology Okanagan Innovations – Sub Project B: Scanning Electron Microscopy	\$1,095,000.00	2010-2013	A.B. Phillion	M. Rheault, J. Greenough
CFI	X-ray Micro-Tomography Facility for Novel In-situ and 3D Characterization of Advanced Materials	\$892,301.00	2010	A.B. Phillion	A. Milani
NSERC RTI	Inverted Metallurgical Microscope (with Image Analysis) for Materials Research	\$50,298.00	2010	L. Bichler	A.B. Phillion
NSERC (Discovery)	Microstructure Development and Defect Formation during the Welding of Aluminum Alloys	\$163,000.00	2010-2015	A.B. Phillion	
UBC	Start-up Funds	\$30,000.00	2010	A.B. Phillion	

Evidence of Research Impact

3D multi-physics meso-scale modelling of casting and welding:

This body of work (9 journal articles) was published in 5 top-tier journals over the past 6 years, and presented as invited talks at 3 international conferences. The main contribution is the development of a new multi-physics and meso-scale modelling method to simulate solidification and semi-solid deformation of a large number of grains (1000+) concurrently with semi-solid deformation and fluid flow to reduce the occurrence of hot tearing in aluminum alloy casting and welding processes. This approach to modelling defects and solidification has now been adopted by other researchers in the materials science community in order to investigate fundamental mechanisms occurring during casting and welding.

The solidification defect known as hot tearing is difficult to predict since it occurs due to a combination of macro-scale (e.g. fluid flow) and microstructure (e.g. grain shape) effects. My initial work in 3D meso-scale modelling of solidification and hot tearing in binary Al-Cu alloys, in collaboration with colleagues at Ecole Polytechnique Federale de Lausanne in Switzerland, produced the 1st model of semi-solid deformation based on fluid-structure interactions and including crack formation. The results showed unambiguously that the critical measure of hot tearing is both strain rate and strain, depending on the ability of the surrounding mushy zone to feed liquid. The question of whether hot tearing was linked to strain rate, strain, or stress had been first posed over 50 years ago. This fundamental study provided important insight into hot tearing, showing that hot tearing would be reduced in material containing small grains since this results in both an increase in semi-solid strength and a decrease in the solidification window for strain localization prior to grain coalescence.

To demonstrate industrial usefulness, we extended the model to simulate solidification during fusion welding of AA6061. By coupling deformation of the weld pool to the transient thermo-mechanical forces that externally deform the mushy zone, we showed that the liquid films within the weld mushy zone do not deform uniformly but instead concentrate along the centreline. Consequently, this area has the highest level of susceptibility to hot cracking. We have subsequently simulated the process of hot tear nucleation, growth, and coalescence using microscale models of crack formation. A comparison of the predicted pore fraction against experimental measurements obtained via X-ray tomography showed very good correlation, indicating that the model can be used as a predictive tool to improve welding quality. We are now applying this model to demonstrate the effects of welding process parameters on crack formation.

CV for ATMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Abbas S. Milani	University of British Columbia, School of Engineering	Composites Research Network-Okanagan	Composite Materials, Manufacturing, Multi-Criteria Process Optimization

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
13	75	79	21	1	12

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

A. Olson, B. Crawford, A. S. Milania (2016) “Characterization of thermal conductivity and tool-part thermal resistance in composite processing”, In: “Layered Composites: Original Research” (ed. Y. Dong), Nova Science Publishers (in press)

M. Haghi Kashani, A. S. Milani (2015) “Damage prediction in woven and non-woven fabric composites”, In: “Non-woven Fabrics”, Editor: Han-Yong Jeon, InTech Publisher, ISBN 978-953-51-4586-8 (in press)

C. Lynam, A. S. Milani (2014) “A Guide to Modeling Thermoplastic Composite Manufacturing Processes: Optimizing Process Variables and Tooling Design Using Finite Element Analysis”, DEStech Publications, Lancaster, USA (ISBN: 978-1-60595-042-6)

b) Journals

M. Haghi Kashani, A. Rashidi, B. Crawford, A. S. Milania (2016) “Analysis of a two-way tension-shear coupling in woven fabrics under combined loading tests: Global to local transformation of non-orthogonal normalized forces and displacements”, Composites Part A, 88: 272–285

c) Conference Proceedings

M. Heinrich, B. Crawford, A. S. Milani (2015) “Degradation of fibreglass composites under natural weathering conditions”, Canadian - International Conference on Composites (CANCOM15), August 18 – 20, Edmonton, Canada

d) Abstracts/Posters**e) Patents****f) Technical Reports/Other****Past and current HQP training history (2005-2015)****Summary:**

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
3	8	15	5	30

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles
Hamidreza Zareie	Industrial PDF	2016-present	A. S. Milani	Toward a fully composite 3D printed SMART Radiator
Maziar Shah Mohammadi	PDF	2012-2014	A. S. Milani	Advancing quality control methods in composites moulding
Mohammad Islam	PDF	2014-2015	A.S. Milani	Design of a control system for a new fabric tester under combined loading modes
Armin Rashidi	PhD	2016-present	A. S. Milani	A hybrid modeling and decision making approach for mitigation of wrinkling defect in woven composites forming processes
Bryn Crawford	PhD	2016-present	A. S. Milani	A new multi-layer Bayesian Network approach to cope with the state of uncertainty and risk in cosmopolite manufacturing
Masoud Haghi Kashani	PhD	2014-present	A. S. Milani	Enhanced damage modelling of consolidated woven composites
Hessamodin Teimouri	PhD	2011-2015	A.S. Milani, R. Seethaler	A new statistical approach to strain-based structural health monitoring of composites under uncertainty
Mohammad Alemi-Ardakani	PhD	2009-2014	A.S. Milani, S. Yannacopoulos	Enhancing impact characterization and multi-criteria design optimization of glass fiber reinforced polypropylene laminates
Mojtaba Komeili	PhD	2010-2014	A.S. Milani	Multi-scale characterization and modeling of shear-tension interaction in woven fabrics for composite forming and structural applications
Mohamadreza Nourani	PhD	2009-2013	A.S. Milani, S.	Integrated multiphysics modeling, testing and optimization of

			Yannacopoulos	friction stir welding of aluminum alloys
Damoon Motamedi	PhD	2009-2013	A.S. Milani	Nonlinear xfem modeling of delamination in fiber reinforced composites considering uncertain fracture properties and effect of fiber bridging
Sina Nezafatkah	MEng	2016-present	A.S. Milani	An advanced exploratory analysis of GFRP composite parts under varying natural weather conditions
Hossein Montazerian	MASc	2016-present	A.S. Milani, M. Hoorfar	Application of sensor embedment technology for condition monitoring of composites forming processes
Ronak Vahed	MASc	2016-present	A.S. Milani	Optimization of extrusion and 3D printing process of thermoplastic composites
Safat Rashif	MASc	2015-present	A.S. Milani, R. Sadiq	Risk identification and management in composites manufacturing
Milad Ramezankhani	MASc	2015-present	A.S. Milani, R. Seethaler	Uncertainty modeling in composites processing
Armin Rashidi	MASc	2014-2016	A. S. Milani	Characterization of wrinkling defect in forming woven fabric composites
Negin Kazemian	MSc	2015-present	J. Klironomos, A.S. Milani	Environmental factors influencing fungal growth on gypsum boards and their biodegradation
Sassan Rakhshani	MASc	2010-present	A. Rteil, A.S. Milani	Numerical investigation of the flexural performance of reinforced concrete beams strengthened with textile reinforced mortar
Samia Sultana Mir	MASc	2014-2015	A.S. Milani	Toward better understanding of mechanical response of fabrics under multiple combined loading modes: experimental and statistical analysis
Juan David Torres Forero	MASc	2012-2015	A.S. Milani, L. Bichler	Effect of geometrical and process parameters on the quality of open moulded composite parts with sharp corners: a decision-based approach
Dylan Schuetze	MASc	2011-2013	A.S. Milani	A numerical model for predicting and optimizing the temperature profile in multi-stage roll forming of thermoplastic composites
Hossein Rokni	MASc	2009-2011	A.S. Milani, R. Seethaler	Optimum distribution of carbon nanotubes to maximize fundamental natural frequencies of polymer-based composite beams
Corey Lynam	MASc	2009-2011	A.S. Milani	Predicting thermal deformations during roll forming of thermoplastic matrix composites
Mojtaba Komeili	MASc	2008-2010	A.S. Milani	Mechanical behavior of woven fabric composites under meso-level uncertainties: modeling and sensitivity analysis

Liao Chiun-Shen	MASc	2008-2010	A. Labun, A.S. Milani	A network approach for thermo-electrical modelling: from IC interconnects to textile composites
Bryn Crawford	Research Associate	2012-present	A.S. Milani	Quality Management in Composite Manufacturing
Kasra Bigdeli	Research Associate	2013-2013	A.S. Milani	Process modeling of thermoplastic composites
Norberto Feito	Visiting Scholar	2015-2015	A.S. Milani	Drilling optimization of carbon fiber composites
Ali Abedian	Visiting Scholar	2012-2013	A.S. Milani, S. Yannacopoulos	Material selection under multiple design criteria
Hasan Hosseini Nasab	Visiting Scholar	2009-2010	A.S. Milani	Coping with imprecision in strategic planning
Over 30 Undergraduate Research Assistants	UGRA	2005-2015	A.S. Milani	Industrial projects related to composites design and manufacturing

Research funding (2005-2015)

Contribution Summary (for group applications, only the portion applied to the author is reported in this table):

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$994,310	\$574,051	\$2,373,732	\$57,000

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
Alberta Bio Future (Invited Proposal; final review)	AB-BC Hybrid: A Multi-Criteria Feasibility Study on Production of New Fly Ash Based Biocomposite Hybrid Laminates for Fire Resistant Applications	\$540,000	2016-2019	Abbas Milani	12 other Co-PIs from the PNMM division of MMRI , faculties from University of Alberta, and Harvard University
MITACS (Accelerate)	Development of an Industrial Design Workflow to Incorporate 3D Scanning for Manufacturing Tooling Processes	\$60,000	2016-2017	Abbas Milani	

CFI (Leaders Opportunity Fund) and BCKDF funds	Facility for Uncertainty-based Design, Manufacture and Characterization of Advanced Composites under Impact Applications	\$275,000	2015	Abbas Milani	
NSERC (Research Tools and Instruments)	An In-Situ Mechanical Testing Stage for High-Resolution X-Ray Computed Tomography Applications	\$105,290	2015	André Phillion	Abbas Milani and 9 others
NSERC (ENGAGE Project Fund)	Evaluating Impact Characteristics of Cargo Aircraft Flooring for Novel Material Solutions	\$25,000	2015	Rudolf Seethaler	Abbas Milan
MITACS (Accelerate)	Design, Manufacture and Testing of a Thermoplastic Composite Guardrail: Modeling Phase	\$15,000	2015	Abbas Milani	
NRC-IRAP (Contribution to Organizations/ CTO)	Support of BC Industry in Evaluating Composite Materials Needs and Opportunities	\$207,893	2014-2016	Anoush Poursartip,	Reza Vaziri, Goran Fernlund, Abbas Milani
NSERC (Discovery Grant- Renewal)	Investigation of Combined Loading Effects during Testing, Modeling and Optimization of Woven Fabrics under Uncertainty: An Application to Forming Processes	\$160,000	2013-2018	Abbas Milani	
NSERC (Connect Grants- Level 2)	Research Collaboration Workshop Series on Composites Manufacturing	\$8,300	2015	Abbas Milani	
NSERC (ENGAGE Project Fund)	Preventing Surface Defects and Cracks in Composite Parts with Sharp Corners	\$25,000	2014	Abbas Milani	
NSERC (ENGAGE Project Fund)	Surface Quality Management of GFRP Moulds during Composite Manufacturing Cycles	\$25,000	2014	Abbas Milani	

UBCO (Individual Research Grant)	Characterization of Creep Phenomenon during the Manufacturing of Glass Fiber-Reinforced Plastic Parts	\$5,000	2013	Abbas Milani	
NSERC (ENGAGE Project Fund)	Understanding and Preventing the Creep Effect during Open-Moulding of GFRP Boat Components	\$25,000	2013	Abbas Milani	
UBCO (Workshop Grant)	Composites in Western Canada - Manufacturing Optimization and Material Characterisation	\$5,000	2013	Abbas Milani	
UBCO (Travel Grant)	Selection of Woven Fabric Composites Using a Multi-Criteria Decision making technique and Meso-Level Finite Element Simulation	\$2,000	2012	Abbas Milani	
NSERC (ENGAGE Project Fund)	Strain-Based Structural Health Monitoring of Aerospace Structures under Uncertainty	\$25,000	2012	Rudolf Seethaler	Abbas Milani
UBCO (Individual Research Grant)	Developing a Robust Approach for Strain-Based Structural Health Monitoring of Composite Structures under Uncertainty	\$5,000	2012	Abbas Milani	
NSERC (Research Tools and Instruments)	A Test System for Dynamic Mechanical Thermal Analysis of Composites and Lightweight Metallic Alloys	\$112,900	2012	Abbas Milani	Andre Phillion, Lukas Bichler
NSERC (Research Tools and Instruments)	Freeze-Thaw Testing Machine for Sustainable Construction Materials	\$135,678	2012	Shahria Alam	Abbas Milani, Sumi Siddiqua
Western Economic Diversification Canada	The pan western Composites Research Network (CRN)*	\$9.8 M	2012-2013	Anoush Poursartip	Multiple nodes; at UBC Okanagan: Abbas Milani
NSERC	Testing, Modeling and	\$24,750	2011	Abbas Milani	Spiro Yannacopoulos

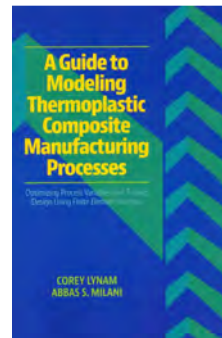
(ENGAGE Project Fund)	Optimization of Friction Stir Welding of Aluminum and Steel Alloys				
UBCO (Individual Research Grant)	Developing a New Friction Stir Welding Test System for Dissimilar Alloys	\$5,000	2011	Abbas Milani	
NRAS-BCIC (Research Team Program)	Development of Design Tools to Help Fibreglass and Composites Companies Reduce Manufacturing Risk	\$293,700	2011- 2013	Anoush Poursartip	Reza Vaziri, Goran Fernlund, Abbas Milani
NSERC (Strategic Project)	Assessment of Biosolids-to-Energy Options for the Okanagan Valley: A Multi-Criteria Decision-Making Approach	\$454,540	2010- 2014	Cigdem Eskicioglu	Thomas Johnson, Abbas Milani, Victor Lo
NSERC (Strategic Project)	Quality Enhancement of Roll Formed Woven Fabric Webs used in Deck Slabs	\$340,000	2010- 2013	Abbas Milani	Reza Vaziri
NSERC (Research Tools and Instruments)	An Advanced Test System for Sustainable Infrastructure Materials	\$150,000	2010	Shahria Alam	Ahmad Rteil, Solomon Tesfamariam, Abbas Milani, Lukas Bichler
CFI (Leaders Opportunity Fund) and BCKDF funds	X-ray Micro-Tomography Facility for Novel In-situ and 3D Characterization of Advanced Materials	\$892,301	2010	André Phillion	Abbas Milani
MITACS-NSERC (through IPS Program)	Modeling of a Multi-Stage Roll Forming Process Applied to Textile Composite Bridge Deck Slabs	\$60,000	2009- 2010	Abbas Milani	Sponsored Student: Corey Lynam
UBCO (Individual Research Grant)	A Comparison of Different Weighting Methods in Modeling Non-Repeatabilities in	\$5,000	2008	Abbas Milani	

	the Response of Woven Fabrics				
NSERC (Discovery)	A Multi-Scale Modeling and Identification Tool for Multi-Objective Design Optimization of Woven Fabrics	\$95,000	2008-2012	Abbas Milani	
UBCO (Start-Up)	N/A	\$30,000	2007	Abbas Milani	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

The following book was one of the main outcomes of an NSERC Strategic Project for which I was the PI at UBC. The work was done in collaboration with both national and international organizations including the Industrial Materials Institute-National Research Council Canada (IMI-NRC) and the US Naval Undersea Warfare Center (NUWC), as well as a number of SMEs in Canada.



Significance: Current trends in the industry show that the next decade will see an explosion in the use of advanced composite materials, as prominent sectors such as aerospace, automotive, biomedical, and defense have already rigorously committed to use composites and related manufacturing technologies to build products and devices that are light and yet very strong. Attention to composites is also driven by the fact that the properties (e.g., bidirectional stiffness, impact resistance, and thermal stability) of products fabricated from these materials can be tailored to a degree impossible with conventional monolithic materials. However, this enormous promise has not yet been fully realized. Despite the many

advantages offered by composites, manufacturers around the world still face uncertainty and risk, specifically in combining robustness with desired structural performance for more sensitive applications such as airframes and human protection systems. At the same time, researchers in academia are struggling to predict the variation of composites' material properties during their life cycle from processing stages to in-service use. Recognizing this academia-industry bilateral challenge, the above book for the first time presented an introductory step-by-step guideline to modeling thermoplastic composite processing using finite element tools, while mitigating risk from experimental characterization phases to final quality performance indicators.

CV for ATMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Lukas Bichler	University of British Columbia, School of Engineering	Spark Plasma Sintering Laboratory Metalcasting Laboratory for non-ferrous alloys	Development of ultralight magnesium and aluminum alloys for advanced structural application Determination of structure – property – processing relationships Development of high temperature materials (ceramics) for thermal barrier applications Fabrication of advanced metal matrix composites via powder metallurgy Development of high entropy materials for advanced aero engine applications

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
0	36	31	0	0	8

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

M. G. Pokorny, C. A. Monroe, C. Beckerman, L. Bichler and C. Ravindran, 2008, “Prediction of Hot Tear Formation in a Mg Alloy PMC”, *Int. J. of Metalcasting*, Vol. 2, No. 4, pp. 41 – 53.

K. D. Robles Arellano, L. Bichler (80%), **K. Akkiraju**, R. Fong (20%) and **K. Mondal**, 2013, “Densification of Spark Plasma Sintered La₂O₃ – YSZ Ceramic Composites”, *Ceramics International*, Vol. 40 (<http://dw.doi.org/10.1016/j.ceramint.2013.06.060>), pp. 715 - 722

A. Karanam and L. Bichler, 2015, “On the Densification of (0.2, 0.5 and 1.0 wt% CNT)-YSZ Composites prepared via Spark Plasma Sintering”, *Metallurgical and Materials Transactions B* (<http://link.springer.com/article/10.1007/s11663-015-0317-y>, In press)

Past and current HQP training history (2005-2015)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
1	2	14	0	14

Details:

Student Name	Type	Years	Supervisor(s)
Dr. Kallol Mondal	PDF	2013	L. Bichler
Mr. Dan Manaig	PhD, Mechanical	2016-Present	L. Bichler
Mr. Mathew Smith	PhD, Mechanical	2014-Present	L. Bichler, S. Yannacopoulos
Ms. Somi Doja	MASc., Mechanical	2015-Present	L. Bichler
Mr. Tyler Davis	MASc, Mechanical	2015-Present	L. Bichler
Mr. William Threlfall	MASc, Mechanical	2014-Present	L. Bichler, A. Rteil
Mr. Christopher Verdon	MASc, Mechanical	2013-2015	L. Bichler
Mr. Karthik Akkiraju	MASc., Materials	2013-2015	B.S. Murty, L. Bichler
Ms. Nivedita Mahesh	MASc., Mechanical	2013-2015	H. Mohammadi, L. Bichler
Mr. Abhinav Karanam	MASc., Mechanical	2013-2015	L. Bichler
Mr. Vishank Kumar	MASc., Mechanical	2013-2015	L. Bichler
Mr. Juan David Torres Forero	MASc., Mechanical	2013-2015	A.Milani, L. Bichler
Ms. Audrey Siebert-Timmer	MASc., Mechanical	2012-2014	L. Bichler
Mr. Vladimir Neykov	MASc., Mechanical	2011-2015	L. Bichler
Ms. Karen Robles	MASc., Mechanical	2011-2013	L. Bichler
Mr. Amit Azad	MASc, Mechanical	2010-2012	L. Bichler
Ms. Michelle Fletcher	MASc, Mechanical	2010-2012	L. Bichler
Mr. Anil Prasad	Visiting Under-graduate Student	2015	L. Bichler, B.S. Murty
Mr. Rafael A. Mongui	Visiting Under-graduate Student	2014-2015	L. Bichler
Mr. Alvaro Sousa	Visiting Under-graduate Student	2014	L. Bichler
Mr. Jessie Brambell	Undergraduate Student	2014	L. Bichler
Mr. William Threlfall	Undergraduate Student	2013-2014	L. Bichler

Ms. Renata de Andrade Castro	Visiting Under-graduate Student	2013	L. Bichler
Mr. Mitchell vanHanegem	Undergraduate Student	2012-2013	L. Bichler
Mr. Stephen I. Varghese	IIT Visiting Scholar	2012	L. Bichler
Mr. Karthik Akkiraju	IIT Visiting Scholar	2012	L. Bichler
Mr. Richard Porritt	Undergraduate Student	2011-2012	L. Bichler
Ms. Audrey Siebert-Timmer	Undergraduate Student	2010-2012	L. Bichler
Ms Karen Robles	Undergraduate Student	2011	L. Bichler
Ms. Michelle Fletcher	Undergraduate Student	2010	L. Bichler
Mr. Addison Twitchell	Undergraduate Student	2010-2011	L. Bichler

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$660,000	\$540,000	\$96,800	\$267,000

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
NSERC (Engage)	Corrosion resistant coatings	\$25,000	2015	L. Bichler	
Mitacs (Cluster Partnership)	UBC Natural Gas Network	\$250,000	2015-2016	D. Tannant, R. Sadiq	L. Bichler, A. Phillion, K. Hewage, S. Tesfamaraiaam
NSERC (RTI)	An in-situ mechanical testing stage for high-resolution X-ray CT applications	\$105,290	2015	A. Phillion	L. Bichler, A. Milani, H. Mohammadi, D. Maijer, S. Alam, K. Kim, S. Siddiqua
NSERC (CRD)	Characterization of intumescent fire-resistant coatings	\$108,000	2015-2018	L. Bichler	
NSERC (Engage)	LFW welding process for INC718	\$25,000	2015	L. Bichler	
AUCC	Queen Elizabeth II International Scholarships for Graduate Students	\$1,100,000	2015-2018	R. Sadiq	L. Bichler, S. Alam, A. Rteil, K. Hewage and J. Brinkerhoff
CFI-IOF	Spark Plasma Sintering Research Laboratory for Advanced Materials (Operating Fund)	\$35,913	2013-2018	L. Bichler	

AUTO21	Advanced Chill Technologies for Casting of Al-Alloys	\$15,800	2014	L. Bichler	
NSERC (Engage)	Properties of fire-resistant intumescent coatings	\$25,000	2013	L. Bichler	
NSERC (Engage)	Using Neutron Diffraction for Analysis of Welds in AR200 Steel Frames	\$25,000	2013	L. Bichler	
UBCO	Travel Grant	\$2,000	2013	L. Bichler	
NSERC (Discovery Supplement)	High Temperature Performance of Materials	\$15,000	2011-2013	L. Bichler	
AUTO21	Advanced Chill Technologies for Casting of Al-Alloys	\$34,000	2012-2013	L. Bichler	
CFI + BCKDF	Spark Plasma Sintering Research Laboratory for Advanced Materials	\$306,412	2012	L. Bichler	
UBCO (Collaborative Internal Grant)	Development of Sustainable Concrete Using Foundry Slag Waste Products	\$10,000	2012-2013	L. Bichler	A. Rteil
NSERC (RTI)	Test System for DMTA of Composites and Lightweight Metals	\$112,900	2012	A. Milani	L. Bichler and A. Phillion
NSERC (RTI)	Micro and Nano-Scale Particle Analyzers with Wet and Dry Dispersion Modules	\$148,852	2012	C. Eskicioglu	L. Bichler, K. Chau and S. Alam
NSERC (RTI)	Thermofluidics Visualization System	\$118,729	2012	S. Li	L. Bichler
NSERC	Regional Opportunities Fund (CMSC Conference)	\$4,626	2011	L. Bichler	
NSERC (RTI)	Thermal Analysis	\$68,278	2011	A. Phillion	L. Bichler, S. Yannacopoulos
NSERC (Strategic)	Development of Zirconia Ceramics for Supercritical Water Nuclear Reactors	\$345,000	2010-2013	L. Bichler	S. Yannacopoulos
NSERC (RTI)	MTS Landmark Testing Frame	\$150,000	2010	S. Alam	L. Bichler, A. Milani, A. Rteil, S. Tesfamariam
UBCO (Internal Grant)	Evolution of Microstructure in AZ Magnesium Alloys	\$5,000	2010	L. Bichler	
NSERC (RTI)	Inverted Optical Microscope	\$50,298	2010	L. Bichler	A. Phillion
NSERC (Discovery Grant)	High Temperature Behavior of Ultralight Magnesium Alloys	\$90,000	2010-2015	L. Bichler	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

Development of Zirconia ceramics for thermal insulation applications in nuclear industry

I work with scientists at Atomic Energy of Canada Ltd. on the development of new zirconia-based ceramics for the next-generation supercritical water (SCW) CANDU nuclear reactors. This project required the fabrication of new ceramics with superior creep and corrosion resistance. I have proposed the chemistries, additives / stabilizers, and subsequently fabricated never-before fabricated ceramic composites using Spark Plasma Sintering process. The newly developed nanophase ceramics with structural reinforcements (e.g., single-wall / multi-wall carbon nanotubes (CNTs)), lattice stabilizers (e.g., Ceria, Neodymia and Lanthana doping) have demonstrated superior high temperature strength and corrosion resistance in the SCW environment in comparison to existing benchmark material (8mol% yttria stabilized zirconia, YSZ).

CV for ATMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Rudolf Seethaler	University of British Columbia, School of Engineering	Control and Automation Laboratory	Smart Materials, Structural Health Monitoring, Controls

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
1	21	18	1	1	1

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

M. N. Islam, R. Seethaler, “Sensorless Position Control For Piezoelectric Actuators Using A Hybrid Position Observer”, IEEE/ASME Transaction of Mechatronics, Vol. 99, pp.1-9, (2013).

M. Rahaman, R. Seethaler, I. Yellowley, “A New Approach to Contour Error Control in High Speed Machining”, Int. J. Mach. Tools Manufact. vol.88, pp. 42-50, 2015. [doi:10.1016/j.ijmachtools.2014.09.002](https://doi.org/10.1016/j.ijmachtools.2014.09.002)

M. Omid, H. Rokni D.T, A.S. Milani, R.J. Seethaler, R. Arasteh², “Prediction of the mechanical characteristics of multi-walled carbon nanotube/epoxy composites using a new form of the rule of mixtures”, CARBON vol. 48, pp. 3218 –3228, 2010.

H. Rokni, Rudolf J. Seethaler, Abbas S. Milani, Xian-Fang Li¹, “Analytical closed-form solutions for size-dependent static pull-in behavior in electrostatic micro-actuators via Fredholm integral method”, Sensors and Actuators A: Physical, vol 190, pp 32–43, Feb 2013.

Zhao, J., Seethaler, R., “A fully flexible valve actuation system for internal combustion engines”, IEEE/ASME Transactions on Mechatronics, vol. 16, no. 2, pp. 361-370, 2011.

Past and current HQP training history (2005-2015)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
0	4	6	0	0

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles
S. Zaire	PhD	2014-present	S. Alam, R. Seethaler	Active structural damping with a combined SMA-MR-damper
H. Teimouri	PhD	2011-2015	A. Milani, R. Seethaler	A Real Time and Time Optimal Trajectory Generator for Cartesian Machine Tools
M. N. Islam	PhD	2008-2013	R. Seethaler	Health monitoring and control of Piezo Fuel injectors
G. Zou	PhD	2008-2011	R. Seethaler, I. Yellowley	An Integrated Model for Force Prediction in Peripheral Milling Operations
B. Reinholz1	M.A.Sc	2014-present	R. Seethaler	Cogging Torque assisted actuators for driving engine Valves
S. Z. Mansour	M.A.Sc	2013-2015	R. Seethaler	Piezoelectric fuel injection for HPDI injectors
M. Rahaman	M.A.Sc.	2011-2013	R. Seethaler, I. Yellowley	High Speed Motion Control of CNC Machine Tools
H. Rokni	M.A.Sc.	2009-2011	A. Milani, R. Seethaler	Optimum Distribution of Carbon Nanotubes to Maximize Fundamental Natural Frequencies of Polymer-Based Composite
J. Zhao	M.A.Sc.	2007-2009	R. Seethaler	A Fully Variable Valve Actuation System for Internal Combustion Engines
M. Mashkournia	M.A.Sc.	2009-2012	R. Koch, R. Seethaler	Electromagnetic Variable Valve Timing on a Single Cylinder Engine in. HCCI and SI

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$377,600	\$360,500	\$5,000	\$35,750

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
NSRC Engage Grant	Evaluating Impact Characteristics of Cargo Aircraft Flooring for Novel Material Solutions	\$25,000	2015	Seethaler	
MITACS	A Novel Torque Measurement Technique Based on Piezoelectric Sensors	\$15,000	2015	Alam	Seethaler Hossain
UBCO School of Engineering Research Tools	Electronic Characterization Tools	\$15,300	2015	Seethaler Eberle Wang	
NSERC Interactions Grant	Development of Piezoelectric Paint Sensors for Static and Dynamic Strain Measurements	\$1,500	2014	Seethaler	
NSRC Engage Grant	Structural Health Monitoring for industrial Steel Buildings	\$25,000	2014	Seethaler	
UBCO School of Engineering Research Tools	Electronic Characterization Tools	\$19,000	2014	Seethaler Eberle Li	
NSERC Discovery Grant	Model Based monitoring and Control in automotive and manufacturing applications	\$115,000	2013-2018	Seethaler	
School of Engineering Research Tools	Laser Micromill Hardware Upgrade	\$17,800	2013	Holzman	Seethaler Johnson

					O'Leary
NSRC Engage Grant	Strain-Based Structural Health Monitoring of Aerospace structures under Uncertainty	\$25,000	2012	Seethaler	
UBC Internal Research Grant	Design of high efficiency window shadings	\$5,000	2012	Seethaler	
School of Engineering Research Tools	Piezo Driver Repair	\$500	2012	Seethaler	
NSERC Strategic Project Grant	Hydrogen Fuel Injectors	\$445,790	2009-2012	Rajapakse	Troczynski Seethaler Gadala
CFI Leaders Opportunity Fund	The advanced Actuator Research Lab	\$316,000	2008-2009	Seethaler	
NSERC Research Tools and Instruments Grant	Equipment for high speed motion control research	\$28,196	2008	Seethaler	
UBC Travel Grant	Travel Grant to IDETC08	\$750	2008	Seethaler	
UBC Internal Research Grant	Multi channel phase locking laser Scanner	\$5,000	2007	Seethaler	
NSERC Discovery Grant	Electronically controlled variable valve systems	\$92,500	2007-2013	Seethaler	
UBC Startup Grant	Support of High Speed Motion Control Research	\$25,000	2006	Seethaler	

Evidence of Research Impact

Piezoelectric fuel injectors for hydrogen engines:

Westport innovations was a technology company specializing in natural gas and hydrogen engines. They were looking for ways to monitor the health and the accuracy of their piezo based hydrogen fuel injectors. Dr. Seethaler's lab developed a monitoring technology that is able to monitor both temperature, position of their actuators without adding dedicated sensors. Even though Westport has not commercialized the technology, they have filed a preliminary patent together with UBC.

CV for ATMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Sunny Li	University of British Columbia, School of Engineering	Electronics Cooling and Multiphase Flows Lab	Heat transfer Fluid mechanics

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
2	18	14	0	4	4

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

R. Li, Y. Shan, “Local Wetting at Contact Line on Textured Hydrophobic Surfaces,” in: K.L. Mittal (ed.) Advances in Contact Angle, Wettability and Adhesion, (73–86), 2013 © Scrivener Publishing LLC (DOI: 10.1002/9781118795620.ch4)

R. Li, N. Ashgriz, S. Chandra, J. R. Andrews and S. Drappel, “Apparent Solidification Contact Angles of Micro-droplets Deposited on Solid Surfaces,” in: K. L. Mittal (ed.) Contact Angle, Wettability and Adhesion, Volume 5, (25–46), 2008 © CRC Press (Print ISBN: 978-90-04-15864-1; eBook ISBN: 978-90-474-2999-9)

b) Journals

R. A. Rana, R. Li. “Thermal protection from a finite period of heat exposure–Heat survival of flight data recorders,” Applied Thermal Engineering 75, 748-755 (2015).

G. Chaudhary, R. Li, “Freezing of water droplets on solid surfaces: An experimental and numerical study,” Experimental Thermal and Fluid Science 57, 86–93 (2014).

X. Gao, R. Li, “Spread and recoiling of liquid droplets impacting solid surfaces,” AIChE Journal 60(7), 2683–2691 (2014).

R. Li, Y. Shan, “Contact Angle and Local Wetting at Contact Line,” Langmuir 28, 15624–15628 (2012).

R. Li, A. Alizadeh, W. Shang, “Adhesion of Liquid Droplets to Rough Surfaces,” Physical Review E 82, 041608, (2010).

c) Conference Proceedings

d) Abstracts/Posters

e) Patents

M. Arik, B. Gerstler, R. Li, B. Whalen, B. Vanderploeg, “Chassis with Distributed Jet Cooling,” US8776871 B2 (2014).

P. Salapakkam, R. Li, M. Arik, W. Gerstler, “Shaped Heat Sinks to Optimize Flow,” US20140318755 A1 (2014).

M. Arik, W. Stanton, T. Stecher, G. Kuenzler, C. Wolfe, R. Li, “Lighting System with Heat Distribution Face Plate,” US 8529097 (2013)

M. Arik, B. Gerstler, R. Li, P. Salapakkam, B. Whalen, “Thermal Management System and Method,” US 20120097377 A1 (2012).

f) Technical Reports/Other

Past and current HQP training history (2005-2015)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master’s	Research Associate/Visiting Scholar	Undergraduate Research Assistant
0	3	3	1	0

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles
Zhengbin Guo	PhD	2016-present	Ri Li	Bubble dynamics
Guoyu Zhang	MASc	2015-present	Joshua Brinkerhoff, Ri Li	Fast fill of natural gas
Lingjian Kong	Visiting PhD*	2014-present	Ri Li	Boiling heat transfer in coiled tubes
Xuan Gao	PhD	2013-	Ri Li	Spray cooling

		present		
Behzad Mohajer	PhD	2013-present	Ri Li	Jet impingement cooling
Ruhul Amin Rana	MASc	2013-2015	Ri Li	Heatsink with low orientation dependency
Nima Moallemi	MASc	2013-2014	Ri Li	Capillary jet breakup

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$539,983	\$427,950	\$15,725	\$38,557

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
NSERC (CRD)	High-efficiency Fast Fill of Compressed Natural Gas	\$119,975	2015-2018	Ri Li	Joshua Brinkerhoff
NSERC (Engage)	Lab-scale fast fill system for natural gas fuel research	\$24,985	2015	Ri Li	
NSERC (CRD)	Fluid-structural science for the design of nursing bottles	\$164,360	2015-2019	Ri Li	
UBCO School of Engineering	SOE Research Tool Grant 2014	5,100	2015	Ri Li	
NSERC (Engage)	Advanced Flow Analysis for Baby Bottles	24,804	2014	Ri Li	
UBCO School of Engineering	SOE Research Tool Grant	19,000	2014	W. Eberle, R. Seethaler, R. Li	
CFI (LOF)	High-speed PIV System for Advanced Electronic Cooling	311,922	2013-2014	Ri Li	
UBC Okanagan	Faculty Travel Grant	2,000	2013	Ri Li	
NSERC (Engage)	Innovative Thermal Design for the Enclosure of EV Battery Chargers	24,719	2013	Ri Li	

NSERC (Engage)	Novel Thermal Solution for Lightweight Aircraft Recording System	24,558	2013	Ri Li	
NSERC (Interaction)	Research Collaboration with Delta-Q	1,582	2012	Ri Li	
NSERC (Discovery)	Enhanced and Predictable Dielectric Spray Cooling for High-heat-flux Electronic Devices	155,000	2012-2017	Ri Li	
NSERC (RTI)	Thermofluidics visualization system	118,729	2012-2013	Ri Li	L. Bichler
UBCO School of Engineering	SOE Research Tool Grant	23,506	2012	NA	W. Eberle, M. Agamy, R. Li
UBC	Start-up fund	30,000	2011	Ri Li	

Evidence of Research Impact

Dr. Li's research lab is equipped with advanced thermal/fluid diagnostic devices including high-frequency stereo particle imaging velocimetry, micro-flow particle imaging velocimetry, high-speed video system, and infrared thermography system. The lab focuses on the experimental research of heat transfer and fluid mechanics:

I). Developing innovative thermal management and cooling technologies, which are able to handle the high-heat fluxes of power electronic devices.

II). Investigating and discovering the fundamental fluid mechanics involved in different types of multiphase flows.

The research lab has been actively collaborating with industrial companies.

1) Contracted by an avionics company, the lab developed the thermal design of flight data recorders for light aircraft, the first product of this kind in Canada.

2) The research lab collaborated with a power electronics company to develop advanced thermal management and packaging for their next generation battery changers of electric vehicles.

3) The lab currently working with a baby bottle company to develop baby nursing bottles with innovative fluid-structure designs.

4) There is an on-going collaboration with a natural gas fuel system company to increase the fast-fill efficiency of compressed natural gas for CNG-fueled vehicles.



Friday, October 09, 2015

**University of British Columbia, Okanagan
UBC Engineering Department**

137 Alumni Avenue
Kelowna, BC V1V 1V7

Attention: André Phillion, Ph.D., P. Eng.
Associate Professor, School of Engineering UBC Okanagan Campus

RE: Support Letter for New Initiative at UBC-O

Northside Industries is a West Kelowna-based corporation with approximately 60 employees that produces metal component applications for the automotive, mining, forestry, and oil and gas industries. The company utilizes laser cutting, rolling, welding and assembly/fabrication for varying industries. Northside Industries specializes in the production of fuel tanks ranging in size from 12" to 29" in diameter.

Northside Industries is currently a leader in the development of quick-fill technologies for fuel tanks, which enables manual refueling in as little as one minute as well as low-cost remote fuelling solutions.

We recommend and welcome the initiative taken by the UBC Okanagan campus to establish an institute for materials and manufacturing research and development. We envision that the collective expertise that this institute will bring from a large number of pure and applied science departments of UBC will be one of the first in its kind and can assist leading companies in the Okanagan, Canada, and beyond to remain competitive.

Our anticipated contribution in the primary stages of establishment of this institute will include direct advice on defining strategic project topics that can be of interest to our industry sector as a whole. In the longer run, once new collaborative projects are established, we anticipate an active participation of our engineering staff in different phases of research with faculty, donating test materials, assisting in training students in complex science and engineering problems, along with collaboration with other industrial sectors for bigger initiatives nationally and internationally.

We look forward to participating in this initiative and being a part of the UBC-O team.

Sincerely,

Neil Ladd
Operations Manager
Northside Industries



November 13, 2015

University of British Columbia
Okanagan Campus
3333 University Way
Kelowna, BC V1V 1V7

Subject: Support letter for establishment of the Materials and Manufacturing Research Institute (MMRI)

Dear Dr. Phillion,

KF Aerospace is a full service aerospace company based in Kelowna, BC, with a focus on heavy aircraft maintenance, overhaul and modifications. We are pleased to offer our support to UBC Okanagan's initiative to establish an institute for materials and manufacturing research and development.

The aerospace industry requires the continual development of new, lightweight materials along with new repair/maintenance techniques. The collective expertise enabled by this institute, through collaboration with engineering and science researchers at UBC, will assist companies within the region and Canada to remain competitive. This opportunity will be further enhanced through collaborative university-industry research projects, and will provide KF Aerospace with access to world-class students who could become future employees in our company.

In the early stages of this institute, we anticipate contributing by offering direct advice on defining strategic research project topics. In the long-term, if opportunities exist, we anticipate actively participating in joint R&D projects, along with collaborating with other industrial sectors for larger initiatives both nationally and internationally.

Best regards,



Gregg Evjen
Director of Engineering

BBMM Division

- **Projected research areas**

- ✓ Cardiovascular Engineering and Technology
- ✓ Design and Development of the Next generation of Prosthetic Heart Valves
- ✓ Cell/Biomaterial Interaction
- ✓ Biodegradable and Biostable Materials
- ✓ Bio- and Tele-Robotics
- ✓ Bio MEMs/NEMs
- ✓ Lab on Chips and Biosensors
- ✓ Cell Mechanotransduction
- ✓ Tissue Mechanobiology
- ✓ Hemodynamics and Computational Fluid Dynamics

Division members and partners:

At UBC Okanagan (Vancouver members of all divisions are listed in a separate document):

Name	Organization/Department	Top Three Areas of Expertise
Keekyoung Kim	Engineering/Faculty of Applied Science	Cell Biomechanics and Microsystems
Hadi Mohammadi	Engineering/Faculty of Applied Science	Biomaterials, Biomechanics and Medical Devices
Mina Hoorfar	Engineering/Faculty of Applied Science	Microfluidics, Biosensors, Embedded sensing technologies
Guy Fradet*	Kelowna General Hospital/Faculty of Medicine	Prosthetic Heart Valves, Tissue Engineering, and Atherosclerosis
Ahmad Poostizadeh*	Kelowna General Hospital/Faculty of Medicine	Prosthetic Heart Valves and Atherosclerosis
Calvin Wan*	Kelowna General Hospital/Faculty of Medicine	Prosthetic Heart Valves and Atherosclerosis
Frank Halperin*	Kelowna General Hospital/Faculty of Medicine	Prosthetic Heart Valves and Atherosclerosis
Paramjit Gil*	Irving K. Barber School of Arts and Sciences	Sport Statistics
Rebecca Tyson*	Irving K. Barber School of Arts and Sciences	Computational Biology
Soheil Mahmoud *	Irving K. Barber School of Arts and Sciences	Biology and Gene expression
Paul Van Donkelaar*	School of Health and Exercise Sciences	Human Performance and Biomechanics
Isaac Li's*	Chemistry	Smart DNA-based biomaterials; Cell screening technology

*The asterisk indicates Associate Member (no CV submission required at this point)

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Top Three Areas of Expertise
Derek Hyde	BC Cancer Agency	Medical Imaging
Andrew Jirasek	BC Cancer Agency	Medical Imaging
Rasika Rajapakshe	BC Cancer Agency	Medical Imaging
Mohammad Mofrad	UC, Berkeley, USA	Heart Valve and Mechanobiology
Arash Kheradvar	UC, Irvine, USA	Heart Valve and Tissue Engineering
Kibret Mequanint	Western University	Vascular Tissue Engineering
Hamid Bani Jamali	University of Calgary	Prosthetic Heart Valve
Xuanhe Zhao	Massachusetts Institute of Technology (MIT), USA	Bio-gels; Soft Active Materials; Mechanics and physics of biomaterials
Kripa K Varanasi	Massachusetts Institute of Technology (MIT), USA	Engineering at the interface between materials, thermal fluids, and manufacturing
James A. Sherwood	University of Massachusetts-Lowell, USA	Sports Engineering and Technology; Composite Materials
Emad Moeendarbary	University College London, UK	AFM micro/nano-indentation characterization of soft tissues

Summary of funding:

NSERC/SSHRC/CI HR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
>\$1M	>\$2M	>\$500,000	>\$500,000

Summary of training record:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/ Visiting Scholar	Undergraduate Research Assistant
>5	>15	>20	>5	>20

Summary of publications record:

Books/Chapters/ Editorials	Journals	Conference Proceedings	Abstracts/ Posters	Patents	Technical Report/ Other
>5	>100	TBC	TBC	TBC	TBC

Anticipated activities including interaction with other divisions of the Institute, and sample facilities/ research infrastructure (Maximum one page)

Anticipated activities: The proposed BBMM provides an opportunity that the knowledge and expertise in the area of biomedical engineering which is already available (directly or indirectly)

to us are brought together. Combining engineering and medicine, this division will pioneer new technologies and methodologies in order to address human-health issues. As the physical, chemical, mathematical and computational sciences merge with biology, medicine, behavior and health, the results are new materials, devices and processes that prevent, diagnose and treat diseases and injuries. The main groups of the proposed BBMM include biomechanics, biomaterials and biochemical engineering, medical imaging, robotics, and BioMicroSystems. The BBMM is basically to promote the accommodating involvement of clinical and basic researchers in applied disciplines such as biomechanics, biomaterials and imaging. This division inspires multidisciplinary linkages between the faculties of Engineering, Medicine, Kelowna General Hospital, etc.

We intend to equip our science and engineering students with a solid training in biomedical engineering and its application to biomedical engineering health-related problems. We intend to carry out innovative research at the leading edge of knowledge in the area of biomedical science and engineering. In the early years, the focus of research will be towards: computational and theoretical biomechanics, medical devices, and cellular and tissue mechanobiology. As the Centre develops in future years, research will expand into emerging fields such as bioinspired materials, biosensors and robotics.

The context for the BBMM at The University of British Columbia's Okanagan campus is rooted in the existence of many interdisciplinary teams which could be potentially engaged in biomedical engineering health-related research. The proposed Centre has the potential to span institutional and departmental boundaries and combine diverse expertise to focus on common research problems and educational objectives. A broad range of interdisciplinary collaborations will be brought together in several laboratories across campus, in the Faculty of Applied Science, School of Engineering and Science (University Campus), Faculty of Medicine and Dentistry's clinical departments and Kelowna General Hospital.

Infrastructure: The initial infrastructure for the BBMM will readily come from within the research groups of the founding members. Examples include advanced instruments and facilities for fabricating hydrogel-based biomaterials available at the Heart Valve Performance Laboratory (HVPL) (Drs. Kim and Mohammadi) and Echocardiography laboratory at the Kelowna General Hospital (Dr. Fradet).

Biography of the Division Co-Lead (interim-UBC Okanagan)



Dr. Hadi Mohammadi: received his BSc. and MSc. degrees in Mechanical Engineering from Sharif University of Technology, Tehran, Iran, and his PhD. degree in Biomedical Engineering from the University of Western Ontario. He worked for a few years as a consultant, research engineer and team leader for a variety of companies, including work in pipeline design, oil recovery and the automotive industry. During his PhD. studies, he was a visiting researcher at the Integrated Manufacturing Technologies Institute (IMTI) of the National Research Council of Canada (NRC), where he worked on the development of an anisotropic and hyperelastic FE-based model for the design and manufacture of polymeric-based heart valve prostheses in a parallel computation platform. Following that he was a postdoctoral trainee for almost four years at the University of Western Ontario, University of Calgary and Harvard Medical School. Then, he joined Trican Well Service Ltd. as a technical advisor working on petroleum geomechanical issues for developing unconventional sources. He is a member of the Professional Engineers Association in the provinces of Alberta and British Columbia.

Biography of the Division Co-Lead (interim-UBC Vancouver)

Dr. Frank K. Ko

Canada Research Chair; Professor (Tier I) in Advanced Fibrous Materials; Director of Advanced Materials and Process Engineering Laboratory (AMPEL), Microsystems and Nanotechnology Group; University of British Columbia, Vancouver

Biography:

Building on a strong nanofibre technology and advanced composite research platform, which includes three significant CFI equipment development (Advanced Fibrous Materials Lab (AFML); Centre for Biointerface characterization (CBiC with Reinhard Jetter); Prometheus Centre for Flexible electronics and e-Textile (with Peyman Servati) and academic/industry collaborative network, the research program led by Professor Frank Ko in the Advanced Fibrous Materials Laboratory is organized into fundamental and applied research. In fundamental research we have made major progress in the analysis of structural mechanics connecting the mechanical properties of individual nanofibre and nanofibre assemblies. In applied research we continue to focus on advanced product development, related to energy (fuel cell and battery electrodes –CRD with AFCC; Elod Gyenge), environment (clean water/air filters –CRD with DPoint, collaboration with Madjid Mohseni and Steve Rogak, and renewable materials-collaboration with Scott Renneckar), electronics (sensors, e-textiles and EMI shields-collaboration with Peyman Servati, Dave Michelson, John Madden) and health care and biomimetic materials (wound dressing with controlled drug release capabilities-collaboration with Aziz Ghahary, self-cleaning nanofibres with Reinhard Jetter, nanomagnetic materials for hyperthermia-with Urs Hafeli, dental nanomaterials with Rick Carvalho) using renewable biomaterials with a strong focus on lignin based nanofibre based materials. These research programs were supported by the Genome BC (with Lindsay Eltis, Suzana Straus) NSERC Lignoworks, two NSERC CRD, and the US Air force Multi-University



Research Initiative (MURI) on Bio-inspired Fly-by feel UAV. Six PhD students and six postdoctoral fellows participated in these programs. One PhD thesis was completed in the engineering design of nanofibre wound dressing under the CHRP program in collaboration with researchers in the Vancouver General Hospital.

The key research findings in the past year demonstrated the effectiveness of nanofibres (NF) as a carrier for multiple functions. This enabled the translation of nanoeffects from functional nanoparticles to higher order structures thus leading to the development of a family of new products in energy, environment, health, and electronic applications. It was recognized that although significant progress has been made in demonstrating the feasibility of composite NF, an examination of the fibre architecture and properties of these nanostructures indicated that these structures are invariably random fibrous assemblies and the properties measured are bulk properties of these nonwovens. It was recognized that the properties of the individual NF have not been fully exploited. Furthermore these NF assemblies are produced mostly with single jet e-spinning systems. There is a need to understand the properties of the NF at the individual NF level and their relationship to higher order structural levels. In order to close the TRL gap, the question of scalability was addressed by the development of a multi-jet e-spinner. Thanks to the two CFI grants that we received, our laboratory is now equipped with a unique NF manipulation and testing system at the single NF level and a pilot scale e-spinning system with multi-jet and roll-to-roll manufacturing capability. Our initial experiments on e-spun single fibre showed a five-fold difference in tensile strength. Resistance (I-V) measurement of individual carbon and metalized NF showed an ohmic behavior. These initial work on single NF studies will enable better understanding of the structure-properties relations at the fundamental level thus facilitate full exploitation of the fibrous materials at the nanoscale. In order to link NF structures to the macro-world a computer controlled 3D braiding machine capable of processing delicate materials has been designed and built to convert the NF assemblies to useful structural shapes.

<http://www.ampel.ubc.ca/>

<http://afml.ampel.ubc.ca/>

CV for BBMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Hadi Mohammadi	University of British Columbia, School of Engineering	Heart Valve Performance Laboratory	Biomedical Engineering, Cardiovascular Mechanics and Medical Devices

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
1	36	30	2	2	0

Sample Publications: Please include sample of most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

Mohammadi H. Prosthetic Heart Valves, Design and Modeling, Nova Science Publishers, Book. In Preparation (15%).

b) Journals

Zareh M, Fradet G, Naser B, Mohammadi H. (2015). Are Two-Dimensional Images Sufficient to Assess The Atherosclerotic Plaque Vulnerability? - A Viscoelastic and Anisotropic Finite Element Model. J of Cardiovascular system, 3(3):1-11.

Jahandardoost M, Mohammadi H, Fradet G. (2015). Elliptic St. Jude Bileaflet Mechanical Heart Valves. Journal of Cardiovascular System, 3: 1: 1-8.

Jahandardoost M, Fradet G, Mohammadi H. (2015). A Novel Computational Model on the Hemodynamics of the Bileaflet Mechanical Heart Valves, Proceedings of the Institution of Mechanical Engineers, Part H, Journal of Engineering in Medicine, 229(3):232-44.

Jahandardoost M, Fradet G, Mohammadi H. (2015). Effect of Heart Rate in the Hemodynamics of Bileaflet Mechanical Heart Valve Prostheses In the Opening Phase, Journal of Cardiovascular Engineering and Technology, Accepted, CVET-D-102-00321.

Hashemi A, Mequanint K, Mohammadi H. (2014). Applications of Blends and Nanocomposite Biomaterials for Articular Cartilage Tissue Engineering, Journal of Materials, Materials 7 (7), 5327-5355.

c) Conference Proceedings

Mohammadi H, **Jahandardoost M**, Fradet G. (2015). Elliptic St. Jude Bileaflet Mechanical Heart Valves, International Society for Biomechanics (ISB), Glasgow, UK - Accepted for **oral** presentation.

Mohammadi H, **Jahandardoost M**, Fradet G. (2015). Elliptic St. Jude Bileaflet Mechanical Heart Valves, Heart Valve Society Meeting, Monaco, France- Accepted for **Poster** presentation.

Mimar R, Nabavi-Nik H, Mohammadi H. (2015). Estimation of Stature from Dynamic Footprint by Pedography, International Society for Biomechanics (ISB), Glasgow, UK - Accepted for **poster** presentation.

Jahandardoost M, Fradet G, Mohammadi H. (2015). Effect of Pulsatility Rate on The Hemodynamics of Bileaflet Mechanical Prosthetic Heart Valves (St. Jude Model) For the Aortic Position in the Opening Phase; A Computational Study, International Society for Biomechanics (ISB), Glasgow, UK– Accepted for **oral** presentation.

Jahandardoost M, Fradet G, Mohammadi H. (2015). A Novel Computational Model for The Hemodynamics of Bileaflet Mechanical Valves in the Opening Phase, International Society for Biomechanics (ISB), Glasgow, UK– Accepted for **oral** presentation.

d) Abstracts/Posters

e) Patents

Wan W.K., Millon L.E., Mohammadi H. (2006) Anisotropic hydrogels for use in tissue replacement and reconstruction, bioagent entrapment and delivery, therapy pads and other medical goods. U.S. and International PCT Provisional Patents, US No.2005/60/666,316-PCT No.2006/000477.

Wan W.K., Millon L.E., Mohammadi H. (2013). Polyvinyl alcohol hydrogel for use in tissue replacement and reconstruction, US Patent 8,465,771.

f) Technical Reports/Other

Past and current HQP training history (2005-2015)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
2	2	3	1	14

Details:

Student Name	Type	Years	Supervisor(s)
Azadeh Hashemi	PDF	2013-2014	H Mohammadi
Raghad Mimar	PDF	2014-2015	H Mohammadi
Mehdi Jahandardoost	PhD	2013-present	H Mohammadi
Nivedita Mahesh	MASc	2013-2015	H Mohammadi L Bichler
Mehrdad Zareh	MASc	2015-present	H Mohammadi GH Naser
Over 10 Undergraduate Research Assistants	BASc	2013-2015	H Mohammadi

Research funding (2013-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$190,000	-	-	\$48,400

Details:

Granting Agency	Subject	COMP	\$ Per Year	Years	Principal Investigator	Co-Investigator(s)
NSERC/EN GAGE	Orthotics	C	25,000	2015	Mohammadi	
NSERC/EN GAGE	Evolution of Ride 9	C	25,000	2015	Mohammadi	
School of Engineering research and tools grant	Prosthetic Heart Valves	NC	10,400	2015	Mohammadi	Naser

NSERC/DG	Towards the next generation of prosthetic heart valves	C	23,000 23,000 23,000 23,000 23,000	2014 2015 2016 2017 2018	Mohammadi	
NSERC/EC R (Early Currier Research Award)	Towards the next generation of prosthetic heart valves	C	5,000 5,000 5,000 5,000 5,000	2014 2015 2016 2017 2018	Mohammadi	
School of Engineering research and tools grant	Prosthetic Heart Valve	NC	8,000	2014	Mohammadi	
UBCO/Start -up	NA	NC	30,000	2013-16	Mohammadi	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

- Certified for the “among top 10 most downloaded” articles from Elsevier's SciVerse ScienceDirect, Journal of Engineering in Medicine, 2014.
- Certified for the “among top 25 most downloaded” articles from Elsevier's SciVerse ScienceDirect, Journal of Medical Engineering and physics, 2011-present, each month.
- Awarded for the 2nd most downloaded article for 2011 from Elsevier's SciVerse ScienceDirect, Journal of Medical Engineering and physics, 2012.

CV for BBMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Keekyoung Kim	School of Engineering	Integrated Bio-Micro/Nanotechnology Lab	3D Bioprinting, BioMEMS, Biomaterials and Tissue engineering

Publication Record (past 10 years)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
2	30	23		1	

Sample Publications: Please include sample of most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

Z. Wang, R. Samanipour, and K. Kim, "Organ-on-a-chip platforms for drug delivery and tissue engineering", Biomedical Engineering: Frontier Research and Converging Technologies, Eds.: H. Jo, H.-W. Jun, J. Shin, and S. Lee, Springer, pp. 209-233, May 2015. (Invited)

X.Y. Liu, K. Kim, Y. Zhang, and Y. Sun, "Nanonewton force sensing and control in microrobotic cell manipulation," Robotics: Science and Systems IV, eds. O. Brock, J. Trinkle, and F. Ramos, MIT Press, pp. 302-309, June 2009.

b) Journals

R. Samanipour, Z. Wang, A. Ahmadi, and K. Kim, "Computational and experimental study of microfluidic flow-focusing generation of hydrogel droplets", *Journal of Applied Polymer Science*, 133:43701, 2016.

Z. Wang, X. Jin, R. Dai, J. Holzman, and K. Kim, "Laser-based ultrafast printing method for cell-laden gelatin methacrylate hydrogel," *RSC Advances*, 6:21099–21104, 2016.

Z. Wang, B. Calpe, J. Zerdani, Y. Lee, J. Oh, A. Khademhosseini, and K. Kim, "High-throughput investigation of endothelial-to-mesenchymal transformation (EndMT) with combinatorial cellular microarrays," *Biotechnology and Bioengineering*, published online (DOI: 10.1002/bit.25905), 31 Dec. 2015.

Z. Wang, R. Abdulla, B. Parker, R. Samanipour, S. Ghosh and K. Kim, "A simple and high-resolution stereolithography-based 3D bioprinting system using visible light crosslinkable bioinks," *Biofabrication*, 7(4): 045009, 2015.

B. Parker*, R. Samanipour*, A. Ahmadi, and K. Kim, "Rapid fabrication of circular channel microfluidic flow-focusing device for hydrogel droplet generation," *Micro and Nano Letters*, 11(1): 41-45, 2016.

c) Conference Proceedings

Z. Wang, R. Samanipour, M. Mohamed, K. Sakthivel, and K. Kim, High-throughput semi-automatic microdroplet generation and characterization system ,” Proceedings of The Canadian Society for Mechanical Engineering International Congress 2016, Kelowna, Canada, June 2016.

Z. Wang, X. Jin, R. Dai, R. Samanipour, A. Boddada, J. Holzman, and K. Kim, "Laser diode-based ultrafast crosslinking of cell-encapsulated gelatin methacrylate hydrogels," World Biomaterials Congress, Montreal, Canada, May 2016.

H. R. Nejad, R. Samanipour, Z. Wang, K. Kim, and M. Hoorfar, "Cell-Patterning and culturing on digital microfluidics," The International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), Gyeongju, South Korea, October 2015.

Z. Wang, R. Abdulla, S. Ghosh, and K. Kim, "A 3D bioprinting system based on visible light stereolithography," Biomechical Engineering Society (BMES) Annual Meeting, Tempa, Florida, USA, October 2015.

Z. Wang, R. Abdulla, B. Parker, R. Samanipour, S. Ghosh and K. Kim, "A high-resolution stereolithography system for 3D bio-printing application," Canada-Korea Conference on Science & Technology, Calgary, Alberta, Canada, July 2015.

d) Abstracts/Posters

e) Patents

K. Kim and Y. Sun, "Electrothermally driven MEMS microgripper with integrated dual-axis capacitive force sensors," Canadian patent filed, 2006. PCT filed, 2007 (WO/2007/147239).

f) Technical Reports/Other

Past and current HQP training history (past 10 years)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
	2	5	2	8

Details:

Student Name	Type	Years	Supervisor(s)
Kabilan Sakthivel	PhD	10/2015-present	Keekyoung Kim and Mina Hoorfar
Mohamed Mohamed	PhD	01/2016-present	Keekyoung Kim
Roya Samanipour*	MSc	01/2014-01/2016	Keekyoung Kim
Zongjie Wang	MASc	09/2014-05/2016	Keekyoung Kim
Towsif Khan	MASc	09/2015-present	Keekyoung Kim and Sumi Siddiqua
Sina Kheiri	MASc	01/2016-present	Keekyoung Kim
Meitham Amereh	MASc	01/2016-present	Keekyoung Kim and Sunny Li

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
\$195,000	\$473,399	-	\$66,300

Details:

Agency and Program	Subject	Total funding \$ (optional column)	Years	Principal Investigator	Co-Investigator(s)
UBC Start-up Fund	Start-up Fund	30,000	2013	Kim	
School of Engineering Research Tools	Purchasing UV curing machine and Programmable syringe pump	8,000	2014	Kim	

(SERT) Grant					
School of Engineering Research Tools (SERT) Grant	Benchtop Plasma Cleaning/Etching System	15,300	2015	Hoorfar	Kim and Najjaran
NSERC RTI	An in-situ Mechanical Testing Stage for High-resolution X-ray Computed Tomography Applications	115,290	2015	Phillion	10 Others
NSERC Research Equipment Replacement, Repair or Purchase Grant	Cryogenic Cell Storage Equipment for Preserving Adipose-derived Stem Cells for 3D Biorpitning	4,312	2015	Kim	
UBCO Individual Research Grant	Development of 3D Heart Tissue-on-a-chip for Cardiotoxicity Assessment	5,000	2015	Kim	
CFI John R. Evans Leaders Funds	Infrastructure for Bionanomaterials and Tissue Engineering Research	125,000	2015	Kim	
School of Engineering Research Tools (SERT) Grant	Laser Cutter	8,000	2016	Foulds	Kim
NSERC (Engage)	Development of Material Release Mechanism for Stereolithography-based 3D Printing System	25,000	2016	Kim	
NSERC (Engage)	Development of Antibacterial Plastics for Baby Bottles	25,000	2016	Kim	
NSERC RTI	Profilometer Urgently Needed to Measure Thickness of Films Made in the Applied Micro and Nanosystems Facility	41,000	2016	Chau	Kim Foulds Hoorfar Holzman Najjaran
NSERC (Discovery)	Microengineered Platforms for High-throughput Characterization	23,000 23,000	2014-15 2015-16	Kim (100%)	

	of Cellular Microenvironments	23,000	2016-17		
		23,000	2017-18		
		23,000	2018-19		

Evidence of Research Impact

Bioprinting is a rapidly developing technique for biofabrication. Because of its high-resolution and the ability to print living cells, bioprinting has been widely used in artificial tissue and organ generation as well as microscale living cell deposition. Stereo lithography is a standard 3D printing process that allows for the creation of materials on a layer-by-layer basis. In this project, we developed a low-cost stereolithography-based bioprinting system that uses visible light crosslinkable bioinks. During 3D bioprinting process cells are combined with biological ink that becomes a bulkier gel-like material, called hydrogel, when exposed to light. The hydrogel acts as a scaffolding system allowing the bone or tissues to regenerate in the desired shape, and is later broken down by enzymes that are secreted as the cells regenerate. This low-cost stereolithography system was built around a commercial projector with a simple water filter to prevent harmful infrared radiation from the projector. A chemical compound developed by our group makes it possible to create biological tissue with a light projector. The compound, a new type of biological ink used in the 3D printing of tissue, eliminates the need to use UV light systems in favour of safer, more conventional light. UV light is known to be cancer-causing and can damage a cell's DNA, which is not ideal when trying to create tissue for medical purposes. By developing our own bio-ink, we can create bone, cartilage and tissue without the risk that we will make the cells sick in the development process. The key to our research was a photo-initiating chemical compound that allowed the bio-ink to react to the light of a normal projector, a light source that has been used to print plastic 3D models but not biological material. With our photo-initiator, we were able to use a more conventional light source, which hadn't really been tried in 3D bio-printing before. The result is we are able to make medical tissue in a way that is not only safer, it's cheaper. The visible light crosslinking was achieved by using a mixture of polyethylene glycol diacrylate (PEGDA) and gelatin methacrylate (GelMA) hydrogel with Eosin Y-based photoinitiator. Three different concentrations of hydrogel mixtures (10% PEG, 5% PEG+5% GelMA, and 2.5% PEG+7.5% GelMA, all in w/v) were studied with presented systems. Experimental results with NIH 3T3 fibroblast cells show that this system can produce a highly vertical 3D structure with 50µm resolution and 85% cell viability for at least five days. The developed system provides a low-cost visible light stereolithography solution and has the potential to be widely used in tissue engineering and bioengineering for microscale cell patterning. Our research in collaboration with Dr. Sanjoy Ghosh in Biology was recently published in the journal Biofabrication (IF: 4.67).



Example of 3D bioprinting of a cell at Dr. Kim's lab



Date: 30 September 2015

Attention: Hadi Mohammadi, PhD, PEng
Assistant Professor | Mechanical Engineering | Okanagan Campus
University of British Columbia, Okanagan
EME 4209, 3333 University Way

Subject: Support letter for establishment of the Materials and Manufacturing Research Institute (MMRI)

Dear Professor Mohammadi,

ViVitro Labs Inc. headquartered in Victoria, BC, offers industry-leading cardiovascular test equipment and related laboratory testing and consulting services. Hundreds of organizations in over 39 countries for 30 years have trusted ViVitro expertise, accuracy, and quality for their heart valve testing.

As a market leader in the Artificial Heart Valve Testing sector of the Medical Device Industry, we continually endeavour towards enhancing our R&D activities, to both provide enhanced products to our customers. As part of these activities we recognize the need for knowledge-based, advanced materials and manufacturing practices to arrive at cost-effective and optimum solutions. Aligned with this vision, we commend and welcome the initiative taken by UBC's Okanagan campus to establish an institute for materials and manufacturing research and development.

We envision that the collective expertise that this institute will bring from a large number of pure and applied science departments of UBC will be one of the first in its kind and can assist leading companies in the region, Canada, and beyond to remain competitive.

We look forward to collaborating / advising on strategic project topics that can be of interest to our industry sector. In the longer run, once new collaborative projects are established, we could anticipate participation of our R&D staff in different phases of research with faculty, along with collaboration with other industrial sectors for bigger initiatives nationally and internationally.

We wish you well in this new initiative,

A handwritten signature in black ink that reads "Gerry Wight". The signature is written in a cursive style and is positioned above a horizontal line.

Gerry Wight B.Eng

General Manager

Vivitro Labs Inc.

Tel: (250) 388-3531 X267

Dir: (250) 940-2428

BCMM Division

- **Projected research areas**

- ✓ Concrete
- ✓ Timber
- ✓ Fiber reinforced plastic
- ✓ High performance metals and alloys
- ✓ Engineered cementitious composite

Division members and partners:

At UBC Okanagan (Vancouver members of all divisions are listed in a separate document):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Dr. Alam	UBC/School of Engineering	Non-destructive Testing Lab, Smart Materials and Structures Lab	Sustainable Construction Materials, Structural Applications of Smart Materials (shape memory alloys) and Sensors, Structural Analysis and Design
Dr. Hewage	UBC/School of Engineering	Project life-cycle management Lab	Green construction, life cycle management, construction management
Dr. Rteil	UBC/School of Engineering	-	Green Cement, Fiber reinforced plastic
Dr. Siddiqua	UBC/School of Engineering	Geomaterial Testing Laboratory	Unsaturated soil, clay, Thermo-hydro-mechanical behaviour, nanoparticles
Dr. Hare	UBC/ IKBSAS, U5, Mathematics	COCANA	Nonsmooth Optimization, Derivative Free Optimization, Variational Analysis

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
A. Said	Penn State University	Materials lab	Nanotechnology in construction material
N. Saleh	University of Texas at Austin	Nano-Engineering	Nanotechnology in

		lab	construction material
M. Bassuoni	University of Manitoba	Materials lab	Sulfate attack, chemical attack
R. Gupta	University of Victoria, Canada	Materials Lab	Hybrid fiber reinforced concrete
T. Brander	Tolko Industries	Timber Lab	Lumber production and processing
H. Mohamed	University of Sherbrook	Composite Lab	Concrete and fiber reinforced plastic rebar
N. Davis	OK Builders Supplies Ltd	Concrete testing lab	Ready-mix concrete, production process
D. Brown	Lafarge Canada Inc	Materials Research Lab	Production process, emissions

Summary of funding:

NSERC/SSHRC/CI HR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
~\$1.9 million	~\$2.3 million	~\$550,000	~\$540,000

Summary of training record:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/ Visiting Scholar	Undergraduate Research Assistant
13	34	58	10	83

Summary of publications record:

Books/Chapters/ Editorials	Journals	Conference Proceedings	Abstracts/ Posters	Patents	Technical Report/ Other
1	157	160	17	7	54

Anticipated activities including interaction with other divisions of the Institute, and sample facilities/ research infrastructure (Maximum one page)

Anticipated activities: The BCMM division will bring together a diverse collection of professors, student researchers, collaborators, and industrial partners broadly engaged in the advancement of cement, concrete, fiber reinforced plastic, timber and steel. The research themes of this division include: construction materials related to buildings, their strength and durability performance in short term and long term, recycling and reusing of by-products, manufacturing process, and utilization of nanotechnology in materials. The members of this division have established a distinguished record of research excellence in the development and application of novel technologies in construction materials and recycling and reusing of industrial wastes in the

development of new materials for construction. Research results have been published in the most prestigious academic journals, including *Smart Materials and Structures*, *Journal of Materials in Civil Engineering*, *Construction and Building Materials*, *Géotechnique*, *ACI Structural Journal*, *Clean Technologies and Environmental Policy*. There are already synergistic collaborations amongst the members of this division. For example, Dr. Alam and Dr. Hewage are working on durability and performance assessment of timber poles for Fortis BC. Dr. Alam and Dr. Rteil have worked on the possible use of shape memory alloy rebar and FRP rebar for building construction. Dr. Siddiqua and Dr. Alam have worked on an NSERC RTI research proposal for purchasing a freeze-thaw durability chamber. The BCMM division will help further catalyze collaborative initiatives amongst its members, including collaborative research projects, joint course offerings, group applications for training grants such as NSERC CREATE.

Infrastructure: Infrastructure for the BCMM division includes cement and concrete mixer, aggregate sieve shaker, high capacity tensile and compressive tester, fatigue testing machine, data acquisition system and sensors various non-destructive testing unit, and tri-axial test unit in Dr. Alam's NDT lab, Dr. Sumi's Geotechnical lab, Dr. Hare's COCANA lab. There is also a diverse range of finite element simulation tools for modelling different type of materials.

Biography of the Division Lead (interim)



Dr. Shahria Alam is an Associate Professor in the School of Engineering at The University of British Columbia's Okanagan campus. He received his PhD in Civil Engineering from Western University in 2008. His research interests include smart materials and their structural applications in bridges and buildings; seismic isolation devices, seismic rehabilitation of structures; performance-based design; recycle/reuse of industrial wastes. Dr. Alam is the Chair of Concrete Structures Sub-Committee and Vice-Chair of the Mechanics and Materials Division of Canadian Society for Civil Engineering (CSCE). He is an active member of Joint ACI-ASCE Committee 441, Reinforced Concrete Columns and ACI Committee 341- Earthquake-Resistant Concrete Bridges. His research interests include structural application of smart and advanced materials, seismic rehabilitation of buildings and bridges, and their performance-based design, and sustainable construction. He has published more than 100 peer reviewed articles in these areas. He is also the recipient of many national and international awards including CSCE Pratley Award 2015 and UBC Moldovan Memorial Award 2014.

CV for BCMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Shahria Alam	UBC/School of Engineering	Nondestructive Testing and Structural Health Monitoring lab (EME 1209), Smart Materials and Structures Lab (EME 0256)	Sustainable Construction Materials, Structural Applications of Smart Materials (shape memory alloys) and Sensors, Structural Analysis and Design

Publication Record (past 10 years)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
0	52	69	5	3	10

Sample Publications: Please include sample of most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

1. Huda, S., and Alam, M.S. (2015). "Mechanical and freeze-thaw durability properties of recycled aggregate concrete made with recycled coarse aggregate," in press, *Journal of Materials in Civil Engineering*, ASCE.
2. Huda, S., and Alam, M.S. (2014). "Mechanical behavior of three generations of 100% repeated recycled coarse aggregate concrete," *Construction and Building Materials*, Elsevier, 65: 574-582.
3. Alam, M.S., Slater, E., Billah, A.H.M. (2013). "Green concrete made with RCA and FRP scrap aggregate: fresh and hardened properties," *ASCE Journal of Materials in Civil Engineering*, 25(12): 1783-1794.*
4. Slater, E., Moni, M., and Alam, M.S. (2012). "Predicting the shear strength of steel fiber reinforced concrete beams," *Construction and Building Materials*, 26(1):423-436.
5. Yeheyis, M., Hewage, K., Alam, M.S., Eskicioglu, C., and Sadiq, R. (2013) "An Overview of Construction and Demolition Waste Management in Canada: A Lifecycle Analysis Approach to Sustainability," *Clean Technologies and Environmental Policy*, 15(1): 81-91.

c) Conference Proceedings

1. Moallemi Pour, S., and Alam, M.S. (2015). "Effect of recycled concrete aggregates on the bond behavior of steel reinforced concrete," accepted, CONMAT'15 The Fifth International Conference on Construction Materials.

2. Huda, S., and Alam, M.S. (2015). "Repeated Recycled Coarse Aggregate Concrete: Durability Aspects." In ConMat' 15, Whistler, BC, Canada, August 2015.
3. Huda, S., and Alam, M.S. (2015). "Mechanical and durability properties of recycled aggregate concrete (RAC) made with different replacement levels of recycled coarse aggregate (RCA)." In 2nd R N Raikar Memorial & Banthia-Basheer International Conference: December 2015.
4. Huda, S.B., Islam, M.S., and Alam, M.S. (2013). "Green concrete from industrial wastes: a sustainable construction material," *First Intl Conference on Concrete Sustainability 2013*, Tokyo, Japan, 27-29 May 2013, Ref. 0084, 8p.
5. Slater, E., Alam, M.S. (2012). "Sustainable concrete made with FRP scrap aggregate (FSA)," *1st Int Conf on Sustaining Public Infrastructure*, CSCE 2012, Edmonton, AB, paper no. INF-1008, 10p.

d) Abstracts/Posters

e) Patents

f) Technical Reports/Other

1. Islam, M.S., and Alam, M.S. (2013). "Load carrying capacity of wood l-joists," Technical Report submitted to Acu-Joist, Kelowna, BC.
2. Parghi, A. and Alam, M.S. (2012). "Polymer modified concrete for pavement applications," submitted to Terratech Canada, Kelowna, BC.
3. Haque, A.B.M.R. and Alam, M.S. (2011), "Bilinear Kinematic, Isotropic and Symmetric Hysteresis Model Development for S-Frame", Submitted to S-FRAME Software Inc., Richmond, BC.
4. Slater, E. and Alam, M.S.. (2011). "Green Concrete: A Sustainable Solution to Concrete Infrastructure", submitted to OK Builders Supplies Ltd, Kelowna, BC, 2011.
5. Youssef, M.A., Alam, M.S., Annan, C.D., and Adawi, A. "Improving performance of hollow core slabs using synthetic fibres," submitted to Prestressed Systems Inc. Windsor, ON, 2009.

Past and current HQP training history (past 10 years)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
4	13	15	3	12

Sample Student Projects Supervised:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles (optional column)
Sumaiya Binte Huda ⁸	MASc	2012-2014	Alam	Mechanical and durability properties of recycled and repeated recycled coarse aggregate concrete

Anantray Parghi ¹¹	PhD	2011-	Alam	Performance concrete columns for long term sustainable construction
Shahidul Islam ¹³	PhD	2012-	Alam	Concrete-FRP bond performance under variable environmental exposures
Sadaf Moallemi Pour ²⁴	MASc	2013-	Alam	Bond strength of recycled aggregate concrete with FRP rebar and steel rebar
Salamah Meherier ²⁵	MASc	2014-	Alam & Banthia	Mechanical and durability properties of rubberized mortar

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
\$1,840,000	\$700,000	\$100,000	\$174,900

Details:

Agency and Program	Subject	Total funding \$ (optional column)	Years	Principal Investigator	Co-Investigator(s)
MITACS (Accelerate)	Improved prediction models for concrete confined with various composites: experimental and numerical investigation	90,000	2014-2017	Shahria Alam	N/A
NSERC (ENGAGE)	Green concrete: A sustainable solution to concrete infrastructure	25,000	2010	Shahria Alam	N/A
NSERC (Collaborative Research & Development)	Green concrete for sustainable construction	32,500	2011-2014	Shahria Alam	N/A
NSERC (ENGAGE)	New Generation Polymer Concrete for Pavement Construction	25,000	2011	Shahria Alam	N/A
NSERC (Engage)	Mechanical properties of fiber reinforced concrete made with	25,000	2015	Shahria Alam	N/A

	recycled concrete aggregate				
Evidence of Research Impact					

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

Huda, S., and Alam, M.S. (2014). "Mechanical behavior of three generations of 100% repeated recycled coarse aggregate concrete," *Construction and Building Materials*, Elsevier, 65: 574-582.

This research focuses on utilizing industrial wastes for the production of industry standard ready-mix concrete. FRP scrap along with recycled concrete have been combined as coarse aggregate and used for producing green concrete. This idea was conceived by myself and I contacted the industry and convinced them to collaborate with UBC and help the community by introducing greener choice in construction materials.

This technology has been adopted by a local ready-mix company who has already successfully implemented in a BC project this year. This research has received much media attention in local newspaper and Global TV channel. This research was awarded *Moldoval Memorial Award 2013*, UBC and Best Paper Award 2013 from Clean Technologies and Environmental Policy, Springer. I have given 5 invited speeches on this particular topic in US, Canada, Bangladesh, and India.

CV for BCMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Kasun Hewage	School of Engineering	Life Cycle Management Laboratory (EME 3287) http://prolmlab.ok.ubc.ca/	Green construction, life cycle management, construction engineering and management

Publication Record (past 10 years)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
-	48	39	12	-	18

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

Feng. H. , Hewage K.N. (2014), Energy saving performance of green vegetation in LEED certified buildings, Energy and Buildings, Elsevier, 75, 281-289, doi: 10.1016/j.enbuild.2013.10.039.

Kamali M., Hewage K.N. (2016), Life cycle performance of modular buildings: A critical review, Renewable & Sustainable Energy Reviews, Elsevier, 62, 1171-1183.

Mogerman A.2, Mendis P.2, Hewage K.N. (2016), Project Delivery and Contracting Strategies for District Energy Projects in Canada, Canadian Journal of Civil Engineering, NRC, Paper accepted on January 1st, 2016. Doi: 10.1139/cjce-2014-0259

c) Conference Proceedings

Ruparathna, R. , Hewage, K., Sadiq, R. (2015) Improving the eco-efficiency of public buildings: A case study of Canada, Build LCA conference, Australian Life Cycle Assessment Society, Melbourne, Australia, 22-27 November, 2015

Chhipi-Shrestha, G.K., Hewage, K.N., Sadiq, R., (2015). System Dynamics Based Decision Support Tool for Achieving Net-Zero Water Urban Communities. The Canadian Society for Civil Engineering, International Construction Specialty Conference (ICSC15), Vancouver, Canada, June 8-10, 2015.

Past and current HQP training history (past 10 years)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
6	17	20	4	6

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles (optional column)

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
\$ ~ 1.5 millions	-	\$ ~ 0.5 millions	\$ ~ 100,000

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

The long-term goal of my research program is to develop models, decision support tools, construction techniques, and guidelines to improve the sustainability of urban neighbourhood development (UND). The overarching objective for the next 5 years is to develop scientifically proven practical solutions, best management practices, and construction techniques to optimize the water-energy-carbon nexus in UND. The proposed research in the next 5 years is a natural evolution of my research program.

Many research studies have emphasized Canada's relatively poor overall sustainability performance compared to other developed countries. Since our world is a giant network of interconnected neighbourhoods, a neighbourhood can be used to model a unique movement towards global sustainability. Urban neighbourhoods can be observed as organisms, with the inputs of water, energy, and materials and the outputs of emission and waste, hypothesized as similar to the human metabolic processes. The life cycle phases of a construction project consist of material extraction, delivery, project design, construction, occupancy or use, and decommissioning. This process can be viewed by considering the resource uses and waste/emission releases in an urban neighbourhood's metabolic system. Water and energy, which can be recognized as the critical streams of an urban neighbourhood's metabolic processes, have substantial life cycle impacts on Green House Gas (GHG) emissions. On a global scale, greenhouse gas reduction is becoming a measure of sustainable performance. Therefore, analyzing water and energy performance, and their life cycle impacts, in terms of Greenhouse gas emissions is a timely approach for assessing the life cycle sustainability of UNDs.

In the next 5 years, my research program will focus on assessing and modeling state-of-the-art water and energy systems in UNDs by considering their environmental and economic performances. The sub-objectives in the next 5 years include a life cycle based environmental (LCA) and economic (LCC) assessment of state-of-the-art water and energy systems in UNDs; development of construction and asset management practices for UNDs; development of a Building Information Model (BIM) and a System Dynamic Model (SDM) based decision support tool to optimize the water-energy-carbon nexus during the life cycle of UNDs; and the development of a Geographic Information System (GIS) based sustainability assessment tool for location specific sustainability assessment in UNDs. In addition, the above sub-objectives will lead to the development of both life cycle based best management practices and guidelines to achieve an optimal water-energy-carbon nexus in UND in North America.

CV for BCMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Sumi Siddiqua	UBC Okanagan	Geomaterial Testing Laboratory	Unsaturated soil Thermo-hydro-mechanical behaviour of clay Soil nanoparticles

Publication Record (past 10 years)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
	16	17			5

Sample Publications: Please include sample of most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

- i. Sarkar, G. and Siddiqua, S. Preliminary studies of hydraulic and mechanical behaviour of nanoparticles based light backfill exposed to pore fluid salinity. ASCE Journal of Hazardous, Toxic, and Radioactive Waste, accepted March 2016.
- ii. Sarkar, G. and Siddiqua, S. Effect of fluid chemistry on the microstructure of light backfill: An X-ray CT investigation. Engineering Geology, vol. 202, 153–162, March 2016.
- iii. Latifi, N. Marto, A., Rashid, A. and Siddiqua, S. Microstructural analysis of strength development in Low and High swelling clays stabilized with Magnesium Chloride Solution – A Green soil stabilizer. Applied Clay Science, vol. 118, 195–206, October 2015.
- iv. Rahman, Z. M. Siddiqua, S. and Kamal, A.K.M. Liquefaction hazard mapping by liquefaction potential index for Dhaka City, Bangladesh. Engineering Geology, vol. 188, 137-147, January 2015.

c) Conference Proceedings

- i. Bigdeli, A. Siddiqua, S. and Williams, N. “Evaluation and control of collapsible soils in Okanagan-Thompson area”. 68th Canadian Geotechnical and 7th Canadian Permafrost Conference, Quebec City, Quebec, 20-23 September 2015.

- ii. Dean, C. Siddiqua, S. Roberts, D. Siemens, G. Characterization of oil sands tailings containing a significant hydrocarbon content and a synthetic polymer. 67th Canadian Geotechnical Conference, Regina, Saskatchewan, 28 September-1 October 2014.

Past and current HQP training history (past 10 years)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
1	6	8		17

Details:

Student Name	Type	Years	Supervisor(s)
Amin Bigdeli	PhD	2014	Sumi Siddiqua
Bardia Tabiatnejad	PhD	2012	Supervisor: Sumi Siddiqua Co-Supervisor: Greg Siemens (Royal Military College, ON)
Fawaz Altamimi	PhD	2014	Sumi Siddiqua
Nurmunira Muhammad	PhD	2015	Sumi Siddiqua
Tianlong Liu	PhD	2013	Supervisor: Deborah Roberts Co-Supervisor: Sumi Siddiqua
Zillur Rahman	PhD	2013	Sumi Siddiqua
Sepehr Rahimi	MASc	2016	Sumi Siddiqua
Towsif Hossain	MASc	2015	Sumi Siddiqua
Md. Umair Khan	MASc	2015	Sumi Siddiqua
Abhinandan Singh Gill	MEng	2015	Sumi Siddiqua
Grytan Sarkar	MASc	2013-2015	Sumi Siddiqua
Ashish Dey	MASc	2013-2014	Sumi Siddiqua
Courtney Dean	MASc	2012-2014	Supervisor: Deborah Roberts Co-Supervisor: Sumi Siddiqua
Iftekhhar Ahmed	MASc	2012-2013	Sumi Siddiqua

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
\$157,000	\$381,883	\$205,000	\$80,800

Details:

Agency and Program	Subject	Years	Principal Investigator	Co-Investigator(s)
Mitacs-Accelerate	Foundation design system for FortisBC's power poles	2016	Sumi Siddiqua	Shahria Alam
NSERC, Engage Grant with Pacific Bentonite Ltd	Development of novel additive utilizing calcium Bentonite for road subgrade application	2016	Sumi Siddiqua	
Mitacs Globalink Research Award – MHRD- for research in India	Temperature effects on geo-materials performance	2016	Sumi Siddiqua	
NSERC, Engage Grant with ACTIVE Enterprises Ltd.	Development of correlation between soil types and helical piles	2015-2016	Sumi Siddiqua	
Mitacs-Accelerate	Design and development of helical pile testing apparatus	2015	Sumi Siddiqua	
Mitacs-Cluster	Avalon Alliance bio-mineral fertilizer technologies	2015-2017	Sumi Siddiqua	Louise Nelson
NSERC (Research Tools and Instruments Grant)	An in-situ mechanical testing stage for high-resolution X-ray Computed Tomography applications	2015	Andre Phillion	Sumi Siddiqua and 9 others
NSERC, Engage Grant	Evaluation and Control of Collapsible soil in Thompson-Okanagan region	2014	Sumi Siddiqua	

NSERC, Discovery Grant	Nanoparticles of Soil and Polymer for Soil Stabilization Studies	2013-2017	Sumi Siddiqua	
CFI, Leaders Opportunity Fund	Establishment of an advanced Geomaterial Testing Laboratory	2013	Sumi Siddiqua	
NSERC, Research Tools and Instruments Grant	Freeze-thaw Testing Machine for Sustainable Construction Materials	2012	Shahria Alam	Sumi Siddiqua Abbas Milani
NSERC, General Research Fund from UBC	Equipment and Student support	2012	Sumi Siddiqua	
Industry Grant	Studies on Clay Based Sealing Materials	2012-2014	Sumi Siddiqua	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

Nanoparticles of soils:

Contribution: Nanotechnology is a new and modern approach in geotechnical engineering field. Due to lack of research data, their influence on the engineering properties of soil is not well understood. Nanoparticles have a distinct potential in the construction industry for the very nature of their physical properties. As a part of my NSERC-DG research program (began in 2013), I worked on the development and characterization of nanoparticles of soils.

Significance: Our work on the nanoparticles resulted in developing methods to process nano-size bentonite clay particles from their micro size counter parts. With our experimental approach, we were able to attain 92% of particles in dimension of less than 100 nm. We identified factors that control the ultimate size of particles. Those factors are (i) the effect of solvent in the grinding process, (ii) time of grinding, (iii) sizes and materials of balls used and (iv) speed of pulverizer (Sarkar, Environmental Geotechnics, 2015). The particle size of nanoparticles were analyzed using Zetasizer Nano ZS and chemical composition of the finer particles were determined using scanning electronic microscopy (SEM) and Energy Dispersive Spectroscopy (EDS).

Impact: Two graduate students (A. Dey and G. Sarkar) completed their MASc thesis under my direct supervision. This research project created new collaboration with Dr. Keekyung Kim from mechanical (Biomedical) engineering to study the use of soil nanoparticles in polymer hydrogel. A MASc student (T. Hossain) started his work on the project in September 2015.

CV for BCMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Warren Hare	IKBSAS, U5, Mathematics	COCANA	Nonsmooth Optimization, Derivative Free Optimization, Variational Analysis

Publication Record (past 10 years)**Summary:**

Books	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
1	41	4	NA	4	> 20

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Journals

W. Hare, M. Solodov, and C. Sagastizabal. A proximal bundle method for nonsmooth nonconvex functions with inexact information. *Comput. Optim. Appl.*, to appear.

Y. Pushak, W. Hare, and Y. Lucet. Multiple-path selection for new highway alignments using discrete algorithms. *European J. Oper. Res.*, 248(2):415-427, 2016.

W. Hare. Numerical approximations of V U-decompositions, U-gradients, and U-hessians. *SIAM J. Optim.*, 24(4):1890-1913, 2014.

b) Patents

C. Speirs, D. Mills, Y. Lucet, W. Hare, F. Rahman. Method and System for Determining the Vertical Alignment of an Infrastructure Corridor." US Patent #20130290071, Oct 2013.

Past and current HQP training history (past 10 years)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
4	2	10	3	11

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles (optional column)
Shangwei Xei	MSc	2015-(2017)	Hare & Loeppky	Road Design
Anuj Bajaj	MSc	2015-(2016)	Hare & Lucet	Approximate Subdifferentials
Chayne Planiden	PhD	2014-(2017)	Hare & Wang	Proximal Operators
Vahid Beiranvand	MSc	2013-(2015)	Hare & Lucet	Road Design
Walaa Moursi	PhD	2010-(2016)	Bauschke & Hare	Monotone Operators
Stefan Sremac	MSc	2013-2015	Hare & Loeppky	Computational Optimization
Majid Jaberipour	Visiting Sch	2014-2014	Hare	Derivative Free Optimization
Bastien Talgorn	Visiting Sch	2013-2013	Hare	Derivative Free Optimization
Goutam Mondal	PDF	2013-2013	Hare & Tesfamariam	Earthquake Retrofitting
Dessalegn Hirpa	MSc	2012-2014	Hare & Tesfamariam	Road Design
Shahadat Hossain	MSc	2011-2013	Hare & Lucet	Road Design
Chayne Planiden	MSc	2011-2013	Hare	Prox-regularity
Kasra Bigdeli	MSc	2010-2012	Hare & Tesfamariam	Earthquake Retrofitting
Julie Nutini	MSc	2010-2012	Hare	Derivative Free Optimization
Mason Macklem	PDF	2010-2011	Bauschke & Hare	Derivative Free Optimization
Valentin Koch	MSc	2009-2010	Hare & Lucet	Road Design
Andrew Park	PDF	2008-2009	Hare	Criminal Dynamic Modelling
Yanchao Wang	PDF	2007-2008	Hare & Rutherford	Health Care Modelling
Germain Tanoh	Visiting Sch	2007-2007	Hare	Health Care Optimization
Yasha Pushak	Undergrad RA	2013, 2014, 2015	Hare & Lucet	Road Design
Deepesh Bharani	Undergrad RA	2013	Hare	Proximal Point Method

Chad Davis	Undergrad RA	2011, 2012	Hare	Normal Cone Approximation
Vivek Verma	Undergrad RA	2012	Hare & Lucet	Derivative Free Optimization
Sunny Mehrotra	Undergrad RA	2011	Hare & Lucet	Road Design
Andrew Campbell	Undergrad RA	2010	Hare	Path Enumeration
Ying Wang	Undergrad RA	2008, 2009	Hare	Computational Optimization
Kenny Kew	Undergrad RA	2008	Hare	Health Care Modelling
Hannah Dodd	Undergrad RA	2007	Hare	Health Care Modelling
Alex Borwein	Undergrad RA	2007	Hare & Rutherford	Health Care Modelling
M.J. Lui	Undergrad RA	2006	Hare & Terlaky	Computational Optimization

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
\$791,000	-	\$30,000	\$1,315,200

Details:

Agency and Program	Subject	Total funding \$ (optional column)	Years	Principal Investigator	Co-Investigator(s)
NSERC CRD	Advanced Optimization Methods for Road Construction	\$72,000/yr	Sept 2015 – Aut 2018	Lucet, Hare, Loepky	Tesfamariam
NSERC Discovery	Exploiting Structure in Nonsmooth Optimization	\$24,000/yr	Apr 2013 – Mar 2018	Hare	
NSERC ENGAGE	Optimization of vibration absorbing elements	\$25,000/yr	Mar 2013-Aug 2013	Hare	Tesfamariam
NSERC CRD	Advanced Optimization Methods for Road Construction	\$36,000/yr	Sept 2011 – Aug 2015	Lucet, Hare	Tesfamariam
NSERC ENGAGE	Optimizing Earthwork for Road Design	\$25,000	July 2010 - Dec 2010	Tesfamariam	Hare, Lucet

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

Road Design. Selecting the best design for a new road can be framed as a multi-level mathematical optimization problem. Typically the problem is broken into three stages: horizontal alignment, vertical alignment, and earthwork. In a series of paper, we have advanced mathematical understanding and computational ability in all of these stages. In 2010, extend the classical model to a mixed integer linear program model that accounts the removal of physical blocks that may influence the earthwork process. In 2013, 2014, we advance the methods to simultaneously solve the vertical alignment and earthwork problems. This contributed to the 2013 patent. A variety of computational techniques to improve the solution time are presented in 2014, and important aspects to improve model accuracy are discussed in 2015. All of these papers appear in top-tier operations research journals.

CV for BCMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Ahmad Rteil	UBC/ School of Engineering		Structural Engineering, Construction Materials

Publication Record (past 10 years)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
	12	33			2

Sample Publications: Please include sample of most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

1. Harajli, M.H. and Rteil, A. 2004. "Effect of Confinement using FRP or FRC on Seismic Performance of Gravity Load-Designed Columns." *ACI Structural Journal*, Vol. 101, #1, Jan-Feb, pp. 47-56.
2. Rteil, A. and Soudki, K. 2011. "CFRP Repair of Corroded Bridge Girder: Four years of Service." Recent Advances in Maintenance and Repair of Concrete Bridges (ACI SP-277), on CD-ROM.
3. Rteil, A.; Soudki, K. and Topper, T. 2011. "Mechanics of bond under repeated loading." *Construction and Building Materials*, Vol. 25, #6, June, pp. 2822-2827.

c) Conference Proceedings

1. Moniruzzaman, P.K.M. and Rteil, A. 2014. "Numerical Comparison between TRM and FRP in Strengthening Corroded Reinforced Concrete Beams." 7th International Conference on FRP Composites in Civil Engineering (CICE 2014), Aug. 20-22, 2014, Vancouver, BC, Canada.
2. Stratton, K. and Rteil, A. 2015. "Investigating the Effect of Bonded Area on FRCM-Concrete Bond using Statistical Analysis." 12th International Symposium on Fiber Reinforcement Polymers for Reinforced Concrete Structures (FRCRCS 12), December 14-16, 2015, Nanjing, China.
3. Stratton, K.; Billows, T. and Rteil, A. 2015. "Using Waste Wood Ash as Cement Replacement: Optimum Temperature and percent Replacement." 5th International Conference on Construction Materials (CONMAT'15), Aug. 19-21, 2015, Whistler, BC, Canada.

Past and current HQP training history (past 10 years)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
-	-	10	-	40

Details:

Student Name	Type	Years	Supervisor(s)
Trevor Billows	MASc	2014-	A. Rteil
William Threlfall	MASc	2014-	A. Rteil/ L. Bichler
Kyle Stratton	MASc	2014-	A. Rteil
Curtis Penson	MASc	2013-	A. Rteil
Sassan Rakhshani	MASc	2010-	A. Rteil/ A. Milani
Afrin Hossain	MASc	2011-2013	A. Rteil/ S. Alam
Md. Shahnewaz	MASc	2011-2013	A. Rteil/ S. Alam
P.K.M. Moniruzzaman	MASc	2011-2013	A. Rteil
Shahriar Quayyum	MASc	2009-2010	A. Rteil
Safeer Abbas	MASc	2008-2010	A. Rteil
Trevor Billows	UG	2013-2014	A. Rteil
Kyle Stratton	UG	2013-2014	A. Rteil
Bruna de Oliveira	UG	2013	A. Rteil
Curtis Penson	UG	2011-2012	A. Rteil
Ellen Morrison	UG	2011-2012	A. Rteil
Mathew Temple	UG	2010	A. Rteil
Robert Machial	UG	2010-2011	A. Rteil/ S. Alam
Cameron Marshall	UG	2010-2011	A. Rteil/ S. Alam

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
\$120,000	\$30,000	\$6,000	\$215,000

Details:

Agency and Program	Subject	Total funding \$ (optional column)	Years	Principal Investigator	Co-Investigator(s)
AUCC (Canadian Queen Elizabeth II Diamond Jubilee Scholarships)	Innovative Solutions for Developing and Managing Climate Resilient Transport Infrastructure in South Asia Region: A Lifecycle Thinking Approach		2015-2018	R. Sadiq	A. Rteil and 4 others
NSERC (Engage grant)	Use of Processed Bentonite Clay as Cementitious Material in Structural Concrete		2013-2014	A. Rteil	
NSERC (Discovery Grant)	Textile reinforced mortar (TRM) for structural strengthening and seismic retrofitting		2011-2015	A. Rteil	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

For the last 15 years, my research has focused on 1) using composite materials, namely fibre reinforced polymer (FRP) and textile reinforced mortar (TRM) to strengthen and retrofit existing structures and 2) lowering the carbon footprint of concrete by using waste and industrial by-products, such as used engine oil and steel slag, as chemical admixtures and aggregate replacement and investigating the use of new cementitious materials, such as bentonite clay and wood ash.

Strengthening of Structures

Canada's infrastructure, mostly built with reinforced concrete (RC), is worth trillions of dollars. Over the years, the demand on the infrastructure has increased, while its state has deteriorated due to different damaging mechanisms. This fact has put the public in danger as well as Canada's economic growth in jeopardy. To meet this challenge, engineers and researchers have been looking into the use of more durable and effective materials to rehabilitate existing structures. The newest emerging and innovative technology in the rehabilitation field is fabric reinforced cementitious mortar (FRCM) also known as textile-reinforced mortar (TRM). FRCM is composed of high strength, lightweight textile fibres embedded in inorganic, cement-based mortar. FRCM are characterized by their high strength-weight ratio, non-corrosiveness, ability to resist high temperatures and to be applied on wet surfaces. The little research that was conducted so far to investigate the feasibility of FRCM to rehabilitate existing structures, has suggested that FRCM will be an excellent rehabilitation material. However, we are still lacking a thorough understanding of the behaviour of structures rehabilitated with FRCM as well as the design techniques required to work with it. The long-term goal of this proposed research program is to incorporate FRCM in building and bridge codes as a strengthening and repair material. What distinguishes this proposal is the fact that it will be the first comprehensive study on FRCM as rehabilitation and strengthening material in Canada and among the first in the world.

Sustainable Construction Materials

The main objective of this research theme is to reduce the carbon footprint of concrete as a construction material. Used engine oil was successfully used as air entrained admixture. We also showed that steel slag can be used as coarse and fine aggregate replacement. Studies on the use of wood ash and bentonite clay as cement replacement have shown that both materials can be used as cement replacement up to 30%, without any effect on concrete strength. The results of this research have been presented to a major cement manufacturer and they showed interest in using bentonite clay in their plants. Currently, we are discussing further research studies and how they would be involved in them.



925 Ellis St., Kelowna B.C. V1Y 1Y9 Telephone: 762-3206 Fax: 762-3877

November 9, 2015

Re: Support letter for establishment of the Materials and Manufacturing Research Institute (MMRI)

Dear Dr. Shahria Alam:

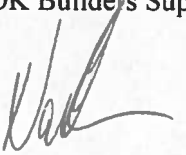
Please accept this letter in support of the establishment of Materials and Manufacturing Research Institute (MMRI) at UBC. OK Builders Supplies Ltd has been involved with your research group in many capacities long term NSERC Collaborative Research and Development (CRD) and NSERC Engage project and capstone project. Besides, we have been supporting UBC's Okanagan campus in various events. We will be happy to be a partner of this institute and potentially benefit from each other through our involvements.

OK Builders Supplies Ltd. is a Canadian-owned ready-mix concrete industry in the Okanagan valley of British Columbia serving the building community since 1953. It has seven ready-mix concrete plants in six cities of BC. OK Builders operates as suppliers of various construction materials for the clients, ensuring that their needs are fulfilled and that their problems are solved innovatively, expeditiously and cost-effectively. Since its inception, the company has grown steadily in services and products ranging from concrete, masonry block, steel rebar, engineered wood products, stones, etc. currently Ok Builders has 150 employees and provides many new and special services including green ready mix concrete in the valley.

As a market leader in the concrete and other construction materials, we continually endeavor towards enhancing our R&D activities, to both provide greater efficiencies in our processes and an ever-superior product for our customers. As part of these activities and experience, we will recognize the need for knowledge-based, advance materials and manufacturing practices to arrive at cost-effective and optimum practical solutions. Aligned with this vision, we commend and welcome the initiative taken by UBC's Okanagan campus to establish and institute for materials and manufacturing research and development. We envision that the collective expertise that this institute will bring from a large number of pure and applied science departments of UBC will be one of the first in its kind can assist leading companies of the region, Canada, and beyond to remain competitive. This opportunity will be further enhanced by benefiting from cutting edge collaborative university-industry research projects and accessing the state-of-the-art research facilities at UBC, along with world-class students who will be tomorrow's employees and leaders in industry and academia.

Our anticipated contribution in the primary stages of establishment of this institute will include direct advice of defining strategic project topics that can be interest to our industry sector as a whole. In the longer run, once new collaborative projects are established, we anticipate an active participation of our R&D staff in different phases of research with faculty, donating test materials, assisting in training students in complex science and engineering problems, along with collaboration with other industrial sectors for bigger initiatives nationally and internationally.

Yours truly,
OK Builders Supplies Ltd.

A handwritten signature in black ink, appearing to read 'Neil Davis', written over the company name.

Neil Davis
Operations Manager
OK Ready Mix

ND/ns

ENMM Division

- **Projected research areas**

- ✓ Nanotechnology, including nanofabrication, nanophysics, and nanochemistry
- ✓ Optical and microwave metamaterials
- ✓ Photonic sensors for environmental monitoring
- ✓ Lab-on-a-chip applications
- ✓ Optical wireless devices
- ✓ Raman spectroscopy
- ✓ Radiation therapy
- ✓ Microwave spectroscopy
- ✓ Low-temperature physics
- ✓ Non-contact voltage sensing
- ✓ Radio-frequency and microwave devices
- ✓ Wireless power transfer
- ✓ Antennas and antenna arrays
- ✓ Thin film devices
- ✓ Semiconductor physics

Division members and partners:

At UBC Okanagan (Vancouver members of all divisions are listed in a separate document):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Dr. Chau	UBC/School of Engineering	Applied Electromagnetics Laboratory	Optics, nanophotonics, metamaterials
Dr. Holzman	UBC/School of Engineering	Integrated Optics Laboratory	Optoelectronics, optical wireless devices, microsensors
Dr. Johnson	UBC/School of Engineering	Microwave Technology Laboratory	Radio frequency and microwaves, wireless power
Dr. Markley	UBC/School of Engineering	Applied Electromagnetic Laboratory	Metamaterials, microwave circuits, antennas
Dr. O'Leary	UBC/School of Engineering	Semiconductor Physics Laboratory	Thin films, electronic materials, electron devices
Dr. Jirasek	UBC/IKBSAS	Medical Physics Laboratory	Medical physics, Raman spectroscopy, radiation therapy
Dr. DiLabio	UBC/IKBSAS	Computational Chemistry Laboratory	Computational chemistry, nanophysics
Dr. Bobowski	UBC/IKBSAS		Microwave

			spectroscopy, low-temperature physics, superconductivity
Dr. Hopkinson	UBC/IKBSAS		Frustrated magnetism, low-dimensional systems, quantum dots
Dr. Foulds*	UBC/School of Engineering		Polymers, lab-on-a-chip, microfabrication
Dr. Jack*	UBC/IKBSAS		Surface chemistry, phase transitions, molecular computer simulations

*The asterisk indicates Associate Member (no CV submission required at this point)

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
H. Lezec	NIST, USA	Center for Nanoscale Science and Technology	Plasmonics, nanofabrication, ion microscopy
P. Ott	Heilbronn University, Germany	Applied Optics	Microscopy, optics, sensors, automotives
R. Gordon	U. Victoria	Nanoplasmonics	Plasmonics, nanofabrication, optics
V. Sieben	Schlumberger	DBR Technology Center	Microfluidics, lab-on-a-chip
A. Brolo	U. Victoria	Chemistry	Analytical chemistry
J. Lum	U. Victoria/BCCA	Deeley Research Centre	Cancer, biology, immunology
D. Roycroft	Zone4 Systems		Chip timing, event registration

Summary of funding:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
~\$1.9 million	~\$2.3 million	~\$550,000	~\$540,000

Summary of training record:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/ Visiting Scholar	Undergraduate Research Assistant
9	43	69	3	121

Summary of publications record:

Books/Chapters/ Editorials	Journals	Conference Proceedings	Abstracts/ Posters	Patents	Technical Report/ Other
12	378	159	310	13	22

Anticipated activities including interaction with other divisions of the Institute, and sample facilities/ research infrastructure (Maximum one page)

Anticipated activities: The ENMM division will bring together a diverse collection of professors, student researchers, collaborators, and industrial partners broadly engaged in the advancement of electromagnetic materials and nanotechnology. The research themes of this division include: Optics and Photonics, Wireless Technology, Micro- and Nano- Electromechanical Systems, Spectroscopy, and Nanoscale Phenomena. The members of this division have established a distinguished record of research excellence in the application of electromagnetic waves for material interrogation, fabrication of novel materials and metamaterials for manipulation of electromagnetic waves, and fundamental examination of nanoscale material phenomena. Research results have been published in the most prestigious academic journals, including *Nature*, *Nature Communications*, *Physical Review Letters*, *Reports on Progress in Physics*, *Applied Physics Letters*, *Physical Review B*, *Optics Express*, *Journal of Applied Physics*, *Lab on a Chip*, and various IEEE journals. There are already synergistic collaborations amongst the members of this division. For example, Dr. Holzman, Dr. Chau, and Dr. Jirasek are working with the BC Cancer Agency to develop novel lab-on-a-chip platforms for performing Raman and terahertz spectroscopy on living cells. As another example, Dr. Johnson and Dr. Bobowski have been collaborating on the development of a non-contact voltage sensor to monitor and track the performance of the electrical grid. The ENMM division will help further catalyze collaborative initiatives amongst its members, including collaborative research projects, joint course offerings, group applications for training grants such as NSERC CREATE.

Infrastructure: Infrastructure for the ENMM division includes advanced nanofabrication capabilities available in the Applied Micro- and Nano-Fabrication Facility, laser systems and optical components in Dr. Holzman's Integrated Optics Laboratory, Dr. Chau's Applied Electromagnetic Laboratory, and Dr. Jirasek's Medical Physics Laboratory, microwave and radio frequency equipment in Dr. Johnson's Microwave Technology Laboratory, and microstructure characterization using a scanning electron microscope and a suite of optical microscopes. There is also a diverse range of simulation tools for modelling electromagnetic and nanoscale phenomena.

Biography of the Division Lead (interim)

Dr. Chau received his PhD from the Department of Electrical and Computer Engineering at the University of Alberta in 2007. From 2008 to 2009, he conducted research in nanoplasmonics at the Center for Nanoscale Science and Technology at the National Institute of Standards and Technology in Gaithersburg, Maryland. He is currently an Associate Professor in the School of Engineering at the University of British Columbia's Okanagan campus in Kelowna, British Columbia. His research activities encompass the areas of optics and photonics, electromagnetics, nanofabrication, microscopy, and sensors for environmental and human health monitoring. A major focus is the exploration of metamaterials with novel optical and opto-mechanical properties made possible by careful material engineering on sub-wavelength scales.

CV for ENMM (Chau)

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Kenneth J Chau	School of Engineering The University of British Columbia	Applied Electromagnetics Laboratory	Optics and photonics, nanofabrication, sensors

Publication Record (past 10 years)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
1	30	30	90	1	

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

M. Bethune-Waddell and K. J. Chau, "Simulations of Radiation Pressure Experiments Narrow Down the Energy and Momentum of Light in Matter," Reports on Progress in Physics, in press (2015). **Impact factor: 17.062**

P. Ott, M. Al Shakhs, and K. J. Chau. "Flat Lens Criterion by Small-Angle Phase," Optics Express 22, 29340-29355 (2014). **Impact factor: 3.488**

Ting Xu, Maxim Abashin, Amit Agrawal, Kenneth J. Chau, and Henri J. Lezec, "All-angle Negative Refraction and Active Flat Lensing in the Ultraviolet," Nature 497, 470-474 (2013). **Impact factor: 41.456**

Kenneth J. Chau and Henri J. Lezec, "Revisiting the Balazs thought experiment in the case of a left-handed material: electromagnetic-pulse-induced displacement of a dispersive, dissipative negative-index slab," Optics Express 20, 10138-10162 (2012). **Impact factor: 3.488**

K. J. Chau, Mark Johnson, and A. Y. Elezzabi, "Electron-Spin-Dependent Terahertz Light Transport in Spintronic-Plasmonic Media," Physical Review Letters 98, 133901 (4pp) (2007). **Impact factor: 7.512**

Past and current HQP training history (past 10 years)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
0	4	6	1	22

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles (optional column)
Peter Ott	Visiting Scholar	2014	Dr. Chau	Fundamental of Flat Lensing
Samuel Schaefer	PhD	2015-	Dr. Chau	Millimeter-Wave Technologies for Environmental Sensors in the 76 GHz Frequency Band
Iman Aghanejad	PhD	2014-	Dr. Chau and Dr. Markley	Analysis, Design, and Fabrication of Optical and Microwave Metamaterials
Mohammed Al Shakhs	PhD	2012-	Dr. Chau	Optical Flat Lenses: Fundamental Concepts and Practical Designs
Reyad Mehruz	PhD	2010-2013	Dr. Chau	Improving the Excitation Efficiency of Surface Plasmon Polaritons Near Small Apertures in Metallic Films
Richard Worthing	MASc	2014-	Dr. Chau and Dr. Johnson	Beat-by-Beat Absolute Blood Pressure Sensor
Wilhelm Wenngren	MASc	2014-	Dr. Chau and Dr. Johnson	Blood Pressure Measurement by Ultrasonic Arterial Imaging: Modelling and Validation
Max Bethune-Waddell	MASc	2013-	Dr. Chau	On the Degeneracy of Electromagnetic Force, Momentum, and Energy Densities
Samuel Schaefer	MASc	2012-2014	Dr. Chau	Colorimetric Water Quality Sensing with Mobile Smart Phones
Muhammed Maqsood	MASc	2010-2011	Dr. Chau	Metal Waveguides for Multi-Axial Light Guiding at Nanometer Scales
Faqrul Chowdhury	MASc	2010-2012	Dr. Chau	Optofluidics for Microscopy and Sensing
Lucian Augusto	BASc	2015	Dr. Chau	Transmission Enhancements of Thin Films due to Coatings of Opposing Susceptibilities
Arna Ghosh	BASc	2015	Dr. Chau	Algorithms for Rapid and Portable Video Microscopy
Trevor Gordon	BASc	2015	Dr. Chau	High-Resolution Smartphone Microscopic Imaging Over Large Areas

Kyle Simkus	BASc	2015	Dr. Chau	Prototyping a Portable, Face-Worn VO2 Sensor
Cailan Libby	BASc	2015	Dr. Chau	Detection of Wax Deposition in Crude Oils by Surface Plasmon Sensors
Proloy Das	BASc	2014	Dr. Chau	Development of a Next-Generation Portable Automated Microscope
John Kump	BASc	2014	Dr. Chau	Design and Fabrication of a Portable Wireless VO2 Monitor
Blaze Neff	BASc	2014	Dr. Chau	Development of a Next-Generation Portable Automated Microscope
Lin Xiang	BASc	2014	Dr. Chau	Design of Omni-Directional Light-Bending Waveguides
Tim Cooke	BASc	2014-2015	Dr. Chau	Development of a Next-Generation Portable Automated Microscope
Wilhelm Wenngren	BASc	2013-2014	Dr. Chau	New Applications for 3D Imaging
Emily Landry	BASc	2011	Dr. Chau	Design of Anti-Reflective Surfaces
Stephen Boehm	BASc	2011-2012	Dr. Chau	Design and Validation of a Portable Microscope
Amit Bhoonah	BASc	2011	Dr. Chau	Electromagnetic Parity Discrimination
Trevor Condon	BASc	2011	Dr. Chau	Software for Automated Microscopy
Andrew Boitchenko	BASc	2010-2011	Dr. Chau	Automation Software for CD Drive Sensor
Samuel Schaefer	BASc	2010-2012	Dr. Chau	Water-Quality Sensor Prototype based on CD Drives
Max Bethune-Waddell	BASc	2010-2013	Dr. Chau	Designing a Broadband Optical Resonator
Dustin Weleski	BASc	2010	Dr. Chau	Dispersion Engineering of Guided Modes
Arlo Johnson	BASc	2009-2010	Dr. Chau	Spectroscopy by Tapered Optical Fibres
Erich Pyde	BASc	2009-2010	Dr. Chau	Design and Construction of Optical Fibre Mounts
Yuchao Zheng	BASc	2009-2010	Dr. Chau	Development of an Automated Motorized Fibre Pulling Station

Research funding (past 10 years)

Contribution Summary (in this summary table, for the group grants please only count the portion of the grant applied to you):

Grants from Tri-Council Agencies (NSERC/SSHRC/CIHR), obtained <u>primarily</u> for research (not equipment)	CFI or other Facility Grants such as RTI, obtained <u>primarily</u> for equipment	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Research Grants, Publication Grants, Etc.)
~\$450,000	~\$350,000	~\$15,000	~\$5,000

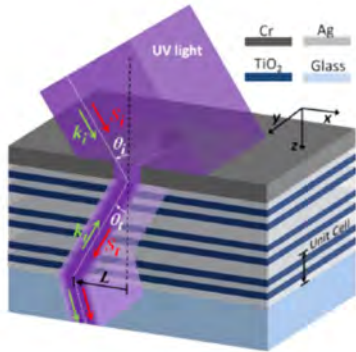
Details:

Agency and Program	Subject	Years	Principal Investigator	Co-Investigator(s)
NSERC Discovery	Plasmonic Metamaterials	2015-2019	Dr. Chau	
NSERC Engage	Three-Dimensional Magnetic Simulation System	2015	Dr. Chau	
NSERC Engage Plus	Development of a Face-Worn VO2 Sensor	2015	Dr. Chau	
MITACS Accelerate	Prototyping Actuators by Electrodynamics Simulations	2015	Dr. Chau	Dr. O'Leary
NSERC Engage	Surface Plasmon Sensor for Detecting Wax Deposition from Crude Oils	2015	Dr. Chau	
NSERC Engage	Development of a Face-Worn VO2 Sensor	2014	Dr. Chau	
UBC Okanagan Equipment Grant	Spectrometer	2013	Dr. Chau	
NSERC RTI	Particle Size Analyzer	2012	Dr. Eskicioglu	Dr. Chau and 2 others
UBC, e@UBC	Entrepreneurship Seed Grant	2012	Dr. Chau	
CIPI TEN	Water Quality Sensors	2010-2012	Dr. Chau	Dr. Roberts
NSERC RTI	Photolithographic Mask Aligner	2011	Dr. Holzman	Dr. Chau and 2 others
Western Economic Diversification	Applied Nano- and Micro-fabrication Facility	2011	Dr. Holzman	Dr. Chau and 5 others
NSERC RTI	Supercontinuum Laser	2009	Dr. Chau	Dr. Holzman
NSERC RTI	E-Beam Evaporator	2009	Dr. Chrostowski	Dr. Chau and 10 others
NSERC Discovery	Integrated Plasmonics	2009-2014	Dr. Chau	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

An isotropic material with an index $n = -1$ has interesting refractive properties such as the ability to focus a point source in three dimensions with a flat slab (Veselago, *Sov. Phys. Usp.* 1968). The search for such a medium has relied on the concept of metamaterials, with recent efforts focused on increasing the operating frequency, as well as achieving a response which is as isotropic as possible. In collaboration with an international team, I experimentally demonstrated a quasi-isotropic left-handed metamaterial with an effective refractive index $n = -1$ (Xu, *Nature* 2013). This was achieved at UV frequencies through the use of a metamaterial based on coupled planar plasmonic waveguides. Broad-angle negative refraction and Veselago flat lensing in three dimensions was demonstrated.



There are many “firsts” achieved by this work: 1) Implementation of a left-handed, negative-index metamaterial at a record-high ultraviolet frequency, a part of the spectrum important for imaging and lithography; 2) demonstration of a volumetric Veselago flat lens that images arbitrary two-dimensional objects beyond the near-field; and 3) experimental validation of a fabrication-friendly planar architecture, not subject to lithographic constraints, that can be used to fabricate metamaterial devices and coatings over large areas at low cost.

Impact evidenced by several invited talks and highlights in *Nature Photonics*, *Nature Physics*, and *Wired Magazine*. The commentary in *Nature Physics* was written by Sir John Pendry, a pioneer of the metamaterial field. According to Google Scholar, the article has been cited 87 times as of Oct 2015, in journals such as *Nature Chemical Biology*, *Nature Communications*, *Scientific Reports*, and *Physical Review A*.

This work was done in collaboration with Dr. Lezec and Dr. Agrawal from the National Institute of Standards and Technology in the USA. Dr. Lezec has been a long-time collaborator of Dr. Chau and is an Adjunct Professor at the School of Engineering.

ENMM Division – Member CV (Bobowski)**Research areas:**

- Microwave spectroscopy
- Electromagnetic property measurements (permittivity, permeability, conductivity)
- Low-temperature physics
- High-temperature superconductivity
- Novel non-contact voltage sensing

Summary of funding record:

- IKBSAS Curricular Innovation Award (\$10,000)

Summary of training record:

Undergraduate Students/Co-op:

- Michelle Sawatsky, Adiabatic demagnetization refrigerator – undergrad thesis (2012/13)
- Mike Fraser, Gifford-McMahon closed-cycle refrigerator – undergrad thesis (2013/14)
- Jaklyn De Vos, Shielding static electric and magnetic fields – undergrad thesis (2013/14)
- Jordan Andrews, Closed-cycle pulse tube refrigerator – undergrad thesis (2014/15)
- Aaron Clements, Electron spin resonance (ESR) using a toroidal split-ring resonator – undergrad thesis (2015/16)

Summary of publications record:

- Refereed journal articles: 11
- Refereed conference proceedings: 5
- Posters and abstracts: 28
- Patents: 1, patent pending
- Technical reports/other: 3 technical reports

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

- Absolute values of the London penetration depth in $\text{YBa}_2\text{Cu}_3\text{O}_{6+y}$ measured by zero field ESR spectroscopy on Gd doped single crystals
T. Pereg-Barnea, P.J. Turner, R. Harris, G.K. Mullins, **J.S. Bobowski**, M. Raudsepp, Ruixing Liang, D.A. Bonn, and W.N. Hardy
Physical Review B, **69**, 184513 (2004)
Journal Impact Factor: 3.736
Number of citations: 76
- Phenomenology of a-axis and b-axis charge dynamics from microwave spectroscopy of highly ordered $\text{YBa}_2\text{Cu}_3\text{O}_{6.50}$ and $\text{YBa}_2\text{Cu}_3\text{O}_{6.993}$
R. Harris, P.J. Turner, Saeid Kamal, A.R. Hosseini, P. Dosanjh, G.K. Mullins, **J.S. Bobowski**, C.P. Bidnost, D.M. Broun, Ruixing Liang, W.N. Hardy, and D.A. Bonn
Physical Review B, **74**, 104508 (2006)
Journal Impact Factor: 3.736
Number of citations: 37

- Bolometric technique for high-resolution broadband microwave spectroscopy of ultra-low-loss samples
P.J. Turner, D.M. Broun, Saeid Kamal, M.E. Hayden, **J.S. Bobowski**, R. Harris, D.C. Morgan, J.S. Preston, D.A. Bonn, and W.N. Hardy
Review of Scientific Instruments, **75**, 124 (2004)
Journal Impact Factor: 1.614
Number of citations: 34
- Precision microwave electrodynamic measurements of K- and Co-doped BaFe₂As₂
J.S. Bobowski, J.C. Baglo, James Day, P. Dosanjh, Rinat Ofer, B.J. Ramshaw, Ruixing Liang, D.A. Bonn, W.N. Hardy, Huiqian Luo, Zhao-Sheng Wang, Lei Fang, and Hai-Hu Wen
Physical Review B, **82**, 094520 (2010)
Journal Impact Factor: 3.736
Number of citations: 26
- Permittivity measurements of biological samples by an open-ended coaxial line
J.S. Bobowski and T. Johnson
Progress In Electromagnetics Research B, **40**, 159 (2012)
Journal Impact Factor: PIER 2011 impact factor 5.298*
Number of citations: 16

Examples of technological projects/community involvement:

When municipal wastewater biodegrades in digesters it releases methane gas which can be captured and used as an energy source. Researchers are investigating various methods of pretreating the wastewater before it enters digesters to enhance the rate that the methane is released. One pretreatment method is irradiating the wastewater with high-power microwaves. In order to optimize the microwave pretreatments, we measured the complex permittivity and conductivity of municipal wastewater as a function of frequency.

The development of a novel broadband microwave spectrometer allowed us to make precision measurements of the electromagnetic properties of high-temperature superconductors. The apparatus, which operates in the temperature range of 0.1 to 20 K, allowed us to measure the surface resistance of superconducting single crystals with sub-micro-ohm resolution. The apparatus was also used to determine the depth that magnetic fields penetrate into these crystals. This custom apparatus has been used to further our understanding of some of the fundamental properties of these materials.

We have designed and built a number of split-ring resonators (SRR) used to measure the electromagnetic properties of various materials. In one example, a cylindrical SRR has been used to measure the dielectric constant and conductivity of water. This project has resulted in a new teaching lab for senior physics undergraduates. We have also developed a novel toroidal SRR that has been used to measure the temperature dependence of the dielectric constant of liquid nitrogen and the complex permittivity of various alcohols. We plan to use the toroidal SRR to measure the complex permeability of ferromagnetic suspensions that have applications in medical physics.

ENMM Division (DiLabio)

Research areas:

Computational studies of i) radical reactions involving organic, inorganic, biological and solid-state systems; ii) noncovalent interactions; iii) oxygen-centred radical induced damage of proteins.

Summary of funding record:

- nanoAlberta (\$206,667)
- Compute Canada (\$220,800)
- Centre for Oil Sands Innovation (\$121,000)

Summary of training record:

Postdoctoral fellows:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
A. Otero de la Roza	Research associate	01/2014	In prog.	Supervisor
M. Koleini ^g	pdf	10/2012	04/2014	Supervisor
E. Torres ^h	Research associate	12/2010	12/2013	Supervisor
J.-L. Carreo-Macedo ⁱ	pdf	01/2011	04/2011	Supervisor
I. D. Mackie ^j	pdf	01/2009	04/2011	Supervisor

Currently held position: g) Post-doctoral fellow – University of Alberta, h) Post-doctoral fellow – Massachusetts Institute of Technology, i) Principle - Simple Cloud Works Inc., j) Grants officer – Northern Alberta Institute of Technology

MASc and PhD students:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
J. van Santen	MSc (Chem)	09/2015		Supervisor
C. Livingston	MSc (Chem)	01/2015		Co-supervisor
S. Sinha ^a	PhD (Chem)	08/2009	04/2012	Co-supervisor
S. McClure ^b	PhD (Chem)	08/2009	04/2011	Co-supervisor
Z. S.-Yazdi	PhD (Phys)	08/2010	05/2014	Co-supervisor
A. Brazeau ^c	MSc (Chem)	09/2004	04/2007	Co-supervisor
M. Smeu ^d	MSc (Phys)	09/2005	09/2007	Supervisor
A. Anagaw ^e	MSc (Phys)	09/2005	09/2007	Supervisor
O. Clarkin ^f	MSc (Chem)	09/2004	09/2006	Supervisor

Currently held position: a) Research scientist - Quantum Technologies Inc., b) Data scientist - Thoughtworks Inc., c) Post-doctoral fellow - Queen's University, d) Post-doctoral fellow - Northwestern University, e) PhD student – University of Alberta, f) Researcher – CGG Inc.

Undergraduates:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
S. Rahemtulla	USRA	04/2015	08/2015	Supervisor
Andre Mottier	UG (Chem)	08/2014	05/2015	Co-Supervisor (w. K. M. Smith)
Jeff van Santen	UG (Chem)	08/2014	05/2015	Supervisor
P. Johnson ^k	UG (Chem)	05/2008	08/2009	Co-supervisor
O. Clarkin ^l	UG (Chem)	05/2003	09/2004	Supervisor
C. Rowley ^m	UG (Chem)	09/2004	04/2005	Co-supervisor
G. Snider ⁿ	UG (Chem)	09/2004	04/2005	Co-supervisor
E. Johnson ^o	UG (Chem)	04/2003	04/2004	Supervisor
D. Pratt ^p	UG (Chem)	08/1998	04/1999	Co-supervisor

Currently held position:k) PhD candidate – McMaster U. Chemistry, l) PhD Candidate – Queen's University Chemistry, m) Assistant professor of Chemistry – Memorial, n) PhD candidate – McGill Chemistry, o) Assistant professor of Chemistry – University of California, Merced, p) Canada Research Chair, Associate professor of Chemistry – University of Ottawa.

Summary of publications record:

- Books and chapters: 2
- Refereed journal articles: 126
- Patents: 4

Below are five examples of most cited/impactful articles and patents from the above publications record, with the impact factors (IFs) shown:

Predicting the activity of phenolic antioxidants: theoretical method, analysis of substituent effects, and application to major families of antioxidants

JS Wright, ER Johnson, GA DiLabio

Journal of the American Chemical Society 123 (6), 1173-1183, 2001

Cited: 941

Field regulation of single-molecule conductivity by a charged surface atom

PG Piva, GA DiLabio, JL Pitters, J Zikovsky, M Rezeq, S Dogel, WA Hofer, ...

Nature 435 (7042), 658-661, 2005

Cited: 295

Theoretical study of XH bond energetics (X= C, N, O, S): application to substituent effects, gas phase acidities, and redox potentials

GA DiLabio, DA Pratt, AD LoFaro, JS Wright

The Journal of Physical Chemistry A 103 (11), 1653-1661, 1999

Cited: 242

Application of 25 density functionals to dispersion-bound homomolecular dimers

ER Johnson, RA Wolkow, GA DiLabio

Chemical physics letters 394 (4), 334-338, 2004

Cited: 215

Dispersion interactions in density-functional theory

ER Johnson, ID Mackie, GA DiLabio

Journal of Physical Organic Chemistry 22 (12), 1127-1135, 2009

Cited: 188

ENMM Division (Holzman)**Research areas:**

- Photonic device technologies
- Optoelectronic sensors
- Optical wireless devices
- Microsensors for lab-on-a-chip applications

Summary of funding record:

- Western Economic Diversification Canada (\$760,000)
- NSERC Discovery Program (\$232,500)
- NSERC Research Tools and Instruments Program (\$218,428)
- NSERC Engage Program (\$100,000)
- NSERC Engage Plus Program (\$56,250)
- CFI (\$749,300)
- Canadian Institute for Photonic Innovations (\$63,690)
- Other funding for which I have been the Principal Investigator (\$60,630)

Summary of training record:

All students listed below have carried out research projects related to photonics systems (optical wireless communication and/or optical switching) or micro-systems (lab-on-a-chip technology).

Student Name	Program	Start	Finish	Supervisor	Co-supervisors
Adebowale, Adebola	Ph.D.	09/2015		J. Cheng	J. F. Holzman
Born, Brandon	Ph.D.	09/2013		J. F. Holzman	
Yang, Luanxia	Ph.D.	09/2011	06/2015	J. Cheng	J. F. Holzman
Collier, Chris	Ph.D.	05/2011		J. F. Holzman	
Jin, Xian	Ph.D.	01/2010		J. F. Holzman	
Niu, Mingbo	Ph.D.	01/2008	12/2012	J. Cheng	J. F. Holzman
Ahmadi, Ali	Ph.D.	09/2007	05/2011	M. Hoorfar	J. F. Holzman, H. Najjarian
Total:	7 Ph.D. students (3 completed, 4 ongoing)				

Student Name	Program	Start	Finish	Supervisor	Co-supervisors
Westgate, Mitchell	M.A.Sc.	09/2015		J. F. Holzman	
Bergen, Mark	M.A.Sc.	05/2014		J. F. Holzman	
Guerrero, Daniel	M.A.Sc.	09/2013		J. F. Holzman	
Nichols, Jackie	M.A.Sc.	01/2011	09/2013	J. F. Holzman	
Abolhasani, Milad	M.A.Sc.	09/2008	04/2010	H. Najjaran	J. F. Holzman, M. Hoorfar
Jin, Xian	M.A.Sc.	09/2007	01/2010	J. F. Holzman	
Total:	6 M.A.Sc. students (3 completed, 3 ongoing)				

Student Name	Program	Start	Finish	Supervisor	Co-supervisors
Barg, Jason	B.A.Sc.	09/2009	04/2010	J. F. Holzman	
	B.A.Sc.	09/2008	04/2009	J. F. Holzman	
Bergen, Mark	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
	B.A.Sc.	09/2012	12/2012	J. F. Holzman	
	B.A.Sc.	01/2012	04/2012	J. F. Holzman	
	B.A.Sc.	05/2011	08/2011	J. F. Holzman	
	B.A.Sc.	09/2010	04/2011	J. F. Holzman	
Bernier, Mike	B.A.Sc.	01/2012	04/2012	J. F. Holzman	
	B.A.Sc.	05/2011	08/2011	J. F. Holzman	
	B.A.Sc.	09/2010	04/2011	J. F. Holzman	
Bethune-Waddell,	B.A.Sc.	09/2012	04/2013	K. Chau	J. F. Holzman, S. O'Leary
Born, Brandon	B.A.Sc.	09/2012	04/2013	J. F. Holzman	
	B.A.Sc.	05/2012	08/2012	J. F. Holzman	
	B.A.Sc.	09/2011	04/2012	J. F. Holzman	
	B.A.Sc.	05/2011	08/2011	J. F. Holzman	
	B.A.Sc.	09/2010	04/2011	J. F. Holzman	
	B.A.Sc.	05/2010	08/2010	J. F. Holzman	
	B.A.Sc.	09/2009	04/2010	J. F. Holzman	
Chaudry, Jamil	B.A.Sc.	05/2007	08/2007	J. F. Holzman	R. Seethaler
Chaves, Hugo	B.Sc.	09/2015	12/2015	J. F. Holzman	
	B.Sc.	05/2015	08/2015	J. F. Holzman	
Collier, Chris	B.A.Sc.	09/2010	04/2011	J. F. Holzman	
	B.A.Sc.	05/2010	08/2010	J. F. Holzman	
	B.A.Sc.	05/2008	08/2008	J. F. Holzman	
Dalgliesh, Mark	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
Devlin, Kurt	B.A.Sc.	05/2009	08/2009	M. Hoorfar	J. F. Holzman
DeWachter, Mark	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
Duerr, Konrad	B.A.Sc.	09/2007	04/2008	J. F. Holzman	R. Seethaler
Fram, Aaron	B.A.Sc.	05/2012	08/2012	J. F. Holzman	
Fredeen, Naomi	B.A.Sc.	06/2015	12/2015	J. F. Holzman	
	B.A.Sc.	11/2013	04/2014	J. F. Holzman	
Garbowski, Jamie	B.A.Sc.	09/2012	04/2013	J. F. Holzman	
	B.A.Sc.	05/2012	08/2012	J. F. Holzman	
Geoffroy-Gagnon, S.	B.A.Sc.	01/2015	04/2015	J. F. Holzman	
	B.A.Sc.	09/2014	12/2014	J. F. Holzman	
	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
Guerrero, Daniel	B.A.Sc.	09/2012	04/2013	R. Klukas	J. F. Holzman
	B.A.Sc.	09/2011	04/2012	J. F. Holzman	
	B.A.Sc.	09/2010	04/2011	J. F. Holzman	
Harvey, Nathan	B.A.Sc.	09/2013	12/2013	J. F. Holzman	
Hill, Kyle	B.A.Sc.	01/2014	04/2014	J. F. Holzman	
	B.A.Sc.	05/2013	08/2013	J. F. Holzman	

Hristovski, Blago	B.A.Sc. B.A.Sc. B.A.Sc.	05/2015 09/2014 05/2014	05/2015 04/2015 08/2014	J. F. Holzman J. F. Holzman J. F. Holzman	
Hristovski, Ilija	B.A.Sc. B.A.Sc.	09/2015 05/2015	04/2016 08/2015	J. F. Holzman J. F. Holzman	
Huizing, Alex	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
Kovacs, Ken	B.A.Sc.	09/2012	04/2013	J. F. Holzman	
Krupa, Jeff	B.Sc. B.Sc. B.Sc. B.Sc.	09/2015 05/2015 05/2014 09/2013	04/2016 08/2015 08/2014 04/2014	J. F. Holzman J. F. Holzman J. F. Holzman J. F. Holzman	
Landry, Emily	B.A.Sc. B.A.Sc. B.A.Sc.	05/2011 05/2010 09/2009	08/2011 08/2010 04/2010	J. F. Holzman J. F. Holzman J. F. Holzman	
L'Orsa, Rachael	B.A.Sc.	09/2007	04/2008	H. Najjaran	J. F. Holzman, M. Hoorfar
Miller, Kurtis	B.A.Sc.	05/2012	08/2012	J. F. Holzman	
Nichols, Jackie	B.A.Sc. B.A.Sc. B.A.Sc. B.A.Sc.	09/2008 05/2008 09/2007 05/2007	04/2009 08/2008 04/2008 08/2007	J. F. Holzman J. F. Holzman J. F. Holzman M. Hoorfar	H. Najjaran J. F. Holzman, H. Najjaran
Palumbo, Jordan	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
Ross, Gordon	B.A.Sc. B.A.Sc.	09/2009 05/2007	04/2010 08/2007	J. F. Holzman J. F. Holzman	
Schwab, Jonah	B.A.Sc. B.A.Sc.	09/2014 05/2014	04/2015 08/2014	J. F. Holzman J. F. Holzman	
Stirling, Trevor	B.A.Sc. B.A.Sc. B.A.Sc.	09/2015 09/2014 05/2014	04/2016 04/2015 08/2014	J. F. Holzman J. F. Holzman J. F. Holzman	A. Jirasek
Taylor, Jordan	B.A.Sc. B.A.Sc.	09/2012 09/2011	04/2013 04/2012	J. F. Holzman J. F. Holzman	
Veerman, Blake	B.A.Sc. B.A.Sc. B.A.Sc.	09/2013 05/2013 09/2011	12/2013 08/2013 04/2012	J. F. Holzman J. F. Holzman J. F. Holzman	
Westgate, Mitchell	B.A.Sc. B.A.Sc.	09/2012 05/2012	04/2013 08/2012	J. F. Holzman J. F. Holzman	
Wiltshire, Mike	B.A.Sc. B.A.Sc. B.A.Sc. B.A.Sc. B.A.Sc.	09/2012 09/2011 05/2011 09/2010 09/2009	04/2013 04/2012 08/2011 04/2011 04/2010	J. F. Holzman J. F. Holzman J. F. Holzman J. F. Holzman J. F. Holzman	
Wylie, Holly	B.A.Sc.	09/2013	04/2014	J. F. Holzman	
Total:		37 B.A.Sc. students (in 84 Research Assistant positions)			

Summary of publications record:

- Books and chapters: 4
- Refereed journal articles: 58
- Refereed conference proceedings: 57
- Posters and abstracts: 10
- Patents: 0
- Technical reports/other: 0

Below are five examples of most cited/impactful articles and patents from the above publications record, with the impact factors (IFs) shown:

1. B. Born, J. D. A. Krupa, S. Geoffroy-Gagnon, and J. F. Holzman, "Integration of photonic nanojets and semiconductor nanoparticles for enhanced all-optical switching," *Nature Communications*, vol. 6, pp. 8097(1-9), September, 2015. [IF = 11.47]
2. A. Arafa, S. Dalmiya, J. F. Holzman, and R. Klukas, "Angle-of-arrival reception for optical wireless location technology," *Optics Express*, vol. 23, pp. 7755-7766, March, 2015. [IF = 3.49]
3. X. Jin, D. Guerrero, R. Klukas, and J. F. Holzman, "Microlenses with tuned focal characteristics for optical wireless imaging," *Applied Physics Letters*, vol. 105, pp. 031102(1-5), July, 2014. [IF = 3.30]
4. X. Jin, B. A. Hristovski, C. M. Collier, S. Geoffroy-Gagnon, B. Born, and J. F. Holzman, "Ultrafast all-optical technologies for bi-directional optical wireless communications," *Optics Letters*, vol. 40, pp. 1583-1586, April, 2015. [IF = 3.18]
5. C. M. Collier, K. A. Hill, M. A. DeWachter, A. M. Huizing, and J. F. Holzman, "Nanophotonic implementation of optoelectrowetting for microdroplet actuation," *Journal of Biomedical Optics*, vol. 20, pp. 025004(1-5), February, 2015. [IF = 2.93]

Examples of technological projects/community involvement:

My research relates to microsensor technologies. Research activities on fabrication are carried out in our Applied Micro and Nanosystems Facility—being a class-100 cleanroom facility that I developed for micro- and nano-fabrication. Analytical research activities are carried out in our Integrated Optics Laboratory—being a facility that I developed for optoelectronic characterizations. The developed microsensors are ultimately deployed in a wide range of applications. Details of these applications are given here.

Microsensors are developed and applied to microfluidic systems. Such advancements have helped meet contemporary demands for on-chip biochemical reagent actuation and sensing. Our research contributions have introduced new digital microfluidic and optofluidic device architectures for on-chip actuation and sensing of reagents. The work has been disseminated in many journal articles and has attracted great interest at conferences.

Microsensors are developed and applied to optical wireless networks. These advancements have helped meet contemporary demands for high-speed communications and wireless mobility. Our optical wireless research has introduced 3-D device architectures that support high-speed operation, for ultra-broadband communications, and wide field-of-view characteristics, for improved wireless link reliability. The work has been published in many journal articles and has been well-received at recent conferences.

ENMM Division (Hopkinson)

Research areas:

Geometrically frustrated magnetism
 Spin ice
 Spin liquids
 Heavy fermions
 Low dimensional systems
 High temperature superconductivity
 Strongly correlated electron systems
 Quantum criticality
 Quantum dots

Summary of funding record:

- NSERC Discovery Program (\$15,701/yr, 2007-2012)
- Brandon University research funding (\$9,514)
- Brandon University Students Union physics education funding (\$3525)

Summary of training record:

Master and PhD students:

Travis Redpath, Masters (defended Nov. 2013 at U of Manitoba), hyperkagome spin ice (frustrated magnetism))

Undergraduate Students/Co-op:

Chris Garner, quantum dimer model (frustrated magnetism, spin liquid, current honours thesis), Albert Ai, artificial spin ice (frustrated magnetism, current honours thesis)

Chris Garner, classical dimer models (frustrated magnetism, URA project, summer '14),

Robin Taylor, Ising model on a new lattice (frustrated magnetism, Monte Carlo, honours thesis '13 (Brandon University)),

Jarrett Beck, frustrated magnetism on new lattices using Monte Carlo: NSERC USRA summers '11, '12, Career focus: summer '10

Ian Russell, ferromagnetic local Ising model (frustrated magnetism, 7 weeks) summer '11

Travis Redpath, spin ice and extended Heisenberg models, (frustrated magnetism) '09 summer-'10 summer (NSERC USRA + other funding)

Justin Moes, local xy model and angle-dependent Kondo effect (frustrated magnetism and heavy fermions, NSERC USRA summers '09, '10)

Alton Leibel, extended Heisenberg model (frustrated magnetism), 7 weeks summer '09

Michael Urchuck, construction of physics demonstrations, summer '12

Chris Sarkonak, construction of interactive physics displays, summer '09

Summary of publications record:

- Refereed journal articles: (11)
- Refereed conference proceedings: (3)
- Posters and abstracts: (20 talks (some given multiple times), 13 posters, 9 posters or talks given by my students)
- Technical reports/other: (3 unpublished articles on arxiv.org, and Travis' thesis while submitted to the U of Manitoba graduate school has yet to be submitted for publication)

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

“Origin and consequence of an unpinned helical magnet: application to partial order in MnSi under pressure”, John M. Hopkinson and Hae-Young Kee, Physical Review B **79** 014421 (2009). (6 pages) 2009 Impact factor: 3.475 (8 citations)

“Geometric frustration inherent to the trillium lattice, a sublattice of the B20 structure”, John M. Hopkinson and Hae-Young Kee, Phys. Rev. B **74** 224441 (2006). (14 pages) 2006 Impact factor: 3.107(9 citations)

“Classical antiferromagnet on a hyper-kagome lattice” John M. Hopkinson, Sergei V. Isakov, Hae-Young Kee and Yong Baek Kim, Phys. Rev. Lett. **99** 037201 (2007). (4 pages) 2007 Impact Factor: 6.944 (25 citations)

“LiV₂O₄: Frustration Induced Heavy Fermion Metal”, J. Hopkinson and P. Coleman, Phys. Rev. Lett. **89** 267201 (2002). (4 pages) 2002 Impact factor: 7.323 (26 citations)

“Supersymmetric Hubbard operators”, P. Coleman, C. Pepin and J. Hopkinson, Phys. Rev. B **63** 140411(R), (2001). (4 pages) (11 citations) (Impact factors for Rapid communications are not generally available, but higher than Phys. Rev. B)

ENMM Division (Jirasek)**Research areas:**

- Medical physics
- Raman spectroscopy
- Radiation therapy

Members and Partners:

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
A. Brolo	U. Victoria	Chemistry	Analytical chemistry
J. Lum	U. Victoria / BCCA	Deeley Research Centre – Biology	Cancer biology, immunology

Summary of funding record:

- Western Economic Diversification Canada (\$130 000, 2008)
- NSERC Discovery Program (\$42,000/yr, 2015 - 2020)
- CFI (\$125,000, 2014)
- CIHR ~\$104,000/yr, 2012 - 2017)

Summary of training record:

Postdoctoral Fellows:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)	Present Position
		Start	Finish		
Quinn Matthews	PostDoc	2011	2013	Co-Supervisor	Physicist, BCCA
Martin Isabelle	PostDoc	2012	2014	Co-Supervisor	Scientist, UK

Master and PhD students:

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)	Present Position
		Start	Finish		
Gavin Sargison	MSc	2004	2005	Comm Member (Phys)	Clinical Physicist, Sask.
Karl Bush	MSc	2004	2006	Comm Member (Phys)	Clinical Physicist, Stanford
Conor Shaw	MSc	2005	2007	Supervisor	PhD UVic
Quinn Matthews	MSc	2006	2008	Supervisor	Med Phys resident, BCCA
Holly Johnston	MSc	2005	2008	Co-Supervisor	Med Phys Resident, Texas
Patricia Baxter	MSc	2004	2008	Supervisor	Rad. Safety, VIHA
David Rudko	MSc	2006	2008	Supervisor	PhD, Western
Karl Bush	PhD	2006	2009	Co-Supervisor	Clinical Physicist, Stanford
Warren Campbell	MSc	2008	2010	Supervisor	PhD UVic
Jason Crawford	MSc	2008	2010	Co-Supervisor	PhD UVic

Meikun Fan	PhD	2005	2010	Comm Member (Chem)	Faculty, China
Fatemeh Soltani	MSc	2008	2010	Comm Member (Phys)	Unkn.
Quinn Matthews	PhD	2008	2011	Supervisor	Med Phys resident, BCCA
Samantha Lloyd	MSc	2009	2011	Co-Supervisor	PhD UVic
Shaun Hall	PhD	2007	2011	Comm Member (Chem)	Postdoc
Greg Brown	MSc	2007	wd	Co-Supervisor	Finance, UK
Holly Johnston	PhD	2010	2013	Supervisor	Med Phys Resident, Texas
James Roberts	MSc	2011	2013	Co-Supervisor	Medical Student, UBC
Dan Morton	MSc	2011	2013	Co-Supervisor	PhD UVic
Samantha Harder	MSc	2011	2013	Supervisor	PhD UVic
Evan Maynard	MSc	2011	2013	Co-Supervisor	PhD UVic
Mei Sato	PhD	2010	2014	Comm Member (EOS)	Unkn
Kelly Stegman	PhD	2011	2014	Comm Member (Eng)	Postdoc (UVic)
Conor Shaw	PhD	2008	2014	Supervisor	App to Residency
Warren Campbell	PhD	2010	2015	Supervisor	App to Residency
Jason Crawford	PhD	2010	Pres	Co-Supervisor	Expected 2014
Joe Kolthammer	PhD	2007	Pres	Comm Member (Phys)	Expected 2014
Reid Townson	PhD	2010	2015	Co-Supervisor	App to Residency
Eyad Al-Hakeem	PhD	2010	Pres	Co-Supervisor	Expected 2015
Samantha Lloyd	PhD	2011	Pres	Co-Supervisor	Expected 2015
Regivaldo Gomes	PhD	2011	Pres	Comm Member (Chem)	Expected 2015
Joanna Mader	MSc	2012	2014	Co-Supervisor	App to Med School
Mark Baker	PhD	2012	Pres	Co-Supervisor	Expected 2015
Clay Lindsay	PhD	2012	Pres	Co-Supervisor	Expected 2015
Evan Maynard	PhD	2013	Pres	Supervisor	Expected 2016
Samantha Harder	PhD	2013	Pres	Supervisor	Expected 2016
Dan Morton	PhD	2013	Pres	Co-Supervisor	Expected 2016

Undergraduate Students/Co-op: (names, topic area)

Student Name	Program Type	Year	Supervisory Role (supervisor, co-supervisor, committee member)
UVic			
Michael Bowerman	Co-op	2002	Co-Supervisor
Conor Shaw	Summer student	2005	Supervisor
Quinn Matthews	NSERC USRA	2005	Supervisor
Quinn Matthews	Senior Proj.	2006	Supervisor
Quinn Matthews	NSERC USRA	2006	Supervisor
Avery Berman	NSERC USRA	2007	Supervisor
Jon Carrick	Senior Proj.	2010	Supervisor
Adele Dummering	NSERC USRA	2010	Supervisor
Chelsey Lane	Summer student	2010	Co-Supervisor
Jon Carrick	Research assist.	2011	Co-Supervisor
Jake Schaddelee	Co-op	2012	Co-Supervisor
Nikita Kuklev	NSERC USRA	2012	Supervisor
UBC			
Allan Melldrum	P449 Hon. Thesis	2014	Supervisor
Matthew Basso	NSERC USRA	2015	Supervisor
Andy Oligvy	Summer RA	2015	Supervisor

Andy Oligvy	P449 Hon. Thesis	2015	Supervisor
Nicholas Somer	P449 Hon. Thesis	2015	Supervisor

Summary of publications record:

- Books and chapters: 2
- Refereed journal articles: 43
- Refereed conference proceedings: 16
- Posters and abstracts: 73
- Patents: 0
- Technical reports/other: 0

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

From Google Scholar:

Polymer gel dosimetry

C Baldock, Y De Deene, S Doran, G Ibbott, A Jirasek, M Lepage, ...

Physics in medicine and biology 55 (5), R1

cited by 319,

year 2010

Polymer gel dosimetry using x-ray computed tomography: a feasibility study

M Hilts, C Audet, C Duzenli, A Jirasek

Physics in medicine and biology 45 (9), 2559

Cited by 167

Year 2000

Investigation of selected baseline removal techniques as candidates for automated implementation

G Schulze, A Jirasek, MML Yu, A Lim, RFB Turner, MW Blades

Applied spectroscopy 59 (5), 545-574

Cited by 149

Year 2005

Characterization of monomer/crosslinker consumption and polymer formation observed in FT-Raman spectra of irradiated polyacrylamide gels

AI Jirasek, C Duzenli, C Audet, J Eldridge

Physics in medicine and biology 46 (1), 151

Cited by 76

Year 2001

Notes:

	IF	5 yr IF	Ranking in Discipline (journal-ranking.com)
Physics in Medicine and Biology:	2.922	3.185	26 / 119
Applied Spectroscopy:	2.01	1.84	26 / 61

ENMM Division (Johnson)

Research areas:

- Radio frequency (RF) and microwave circuits
- Wireless power
- Industrial applications of RF and microwave power
- Applied electromagnetics
- Sensors (bio-medical applications and electric field sensing)
- Measurement of electrical properties of materials (eg: dielectric properties of biological materials)
- Waveguide feed antennas

Summary of funding record:

- Western Economic Diversification Canada (\$760,000 – my portion 5%)
- NSERC Discovery Program (\$120,000 / 5 years)
- NSERC Engage Program (\$75,000)
- NESRC Strategic Grants Program (\$454,540 – my portion 22%)
- CFI (\$312,500)
- MITACS (\$11,000)
- Industry Contracts (\$148,700)

Summary of training record:

Post-doctoral Fellows	Topic	Year
Dr. Jake Bobowski	dielectric characterization of biological materials	2011/12
Dr. David Constable	microwave heating using an array of independent sources in a large microwave cavity	2013

PhD Students	Topic	Status
Sadegh Abbasian	High efficiency switch-mode amplifiers and rectifiers for wireless applications	Defense scheduled for Oct. 22, 2015
Louis Xiao	Outphasing Power Amplifiers	In progress
Soroush Dehghani	CMOS Radio Frequency rectifiers for wireless power applications	In progress
Xuan Du	Ultra-broadband coaxial waveguide feed antenna for radio astronomy applications	In progress

MASc Students	Topic	Status
Harish Rajput	Electrothermal modeling for CMOS transistors	Graduated 2011
Andre Johnson	Nested coaxial waveguide feed antenna for radio astronomy applications	Graduated 2012
Sheikh Ali	Switch-mode power amplifier with signal separation for energy recycling	Graduated 2012
Nima Moazen	Complementary filters for wideband frequency splitting	Graduated 2014
Md. Saimoom Ferdous	Radio Frequency heating system for biological materials	Graduated 2015
Wilhelm Wenggren	Blood pressure sensor using ultrasound and	In progress

	optical measurement techniques	
Tyler Worthing	Blood pressure sensor using ultrasound and optical measurement techniques	In progress

Undergraduate Students	Topic	Year
Meesh Bono	Methods to improve worker safety in high voltage electric fields	Current
Aaron Clements	Methods to improve worker safety in high voltage electric fields	Current
Vipul Vishnoi	Wireless data acquisition	2014
Nobuyoshi Torigoe	Wireless data acquisition	2014
Devyn Farr	Measurement and test of GaN microwave integrated circuits	2011/12
Paul Banwell	Programming an arbitrary waveform generator	2010

Internship Students	Topic	Country / School
Ricardo de Oliveira	Maximum power point tracking load for RF rectifiers	Brazil (2013)
Rohit Kumar	Pulse encoding for switch-mode power amplifiers	India / IIT (2014)
Shanu Yogi	Pulse encoding for switch-mode power amplifiers	India/ IIT (2014)

Summary of publications record:

- Books and chapters: (n/a)
- Refereed journal articles: (12)
- Refereed conference proceedings: (15)
- Posters and abstracts: (8)
- Patents: (8)
- Technical reports/other: (15)

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

J. Bobowski, Md. S. Ferdous and T. Johnson, "Calibrated single-contact voltage sensor for high-voltage monitoring applications," *IEEE Trans. on Instrumentation and Measurement*, Vol. 64, No. 4, Apr. 2015, pp. 923-934. (2014 Impact Factor 1.79)

J. S. Bobowski and T. Johnson, "Permittivity measurements of biological samples by an open-ended coaxial line," *Progress in Electromagnetics Research (PIER) B*, vol. 30, 2012, pp. 159-183. (2014 Impact Factor 1.23; 16 citations)

N. Mehdizadeh, C. Eskicioglu, J. Bobowski, and T. Johnson, "Conductive heating and microwave hydrolysis under identical heating profiles for advanced anaerobic digestion of municipal sludge," *Water Research*, Vol. 47, No. 14, 2013, pp. 5040-5051 (September 2013) (2014 Impact Factor 5.5; 16 citations)

T. Johnson and S. Stapleton, "Comparison of Bandpass Sigma-Delta Modulator Coding Efficiency with a Periodic Signal Model," *IEEE Trans. Circuits and Systems - I Regular Papers*, Vol. 55, No. 11, Dec. 2008, pp. 3763-3775. (2014 Impact Factor 2.4; 20 citations)

T. Johnson and S. Stapleton, "RF Class D Amplification with Bandpass Sigma-Delta Modulator Drive Signals," *IEEE Trans. Circuits and Systems - I Regular Papers*, Vol. 53, No. 12, Dec. 2006, pp. 2507-2520. (2014 Impact Factor 2.4; 96 citations)

Examples of technological projects/community involvement:

Single contact sensor for measuring voltage on distribution lines in the electric grid: In a research project sponsored by Awesense Wireless, we designed an electric field sensor that can be used to measure the potential difference between two high voltage distribution lines. Potential difference is usually measured by contacting both conductors, and the research objective of this project was to find a way to make a calibrated voltage measurement by making contact with only one conductor. The stray field capacitance to the non-contacted conductor is estimated from a series of measurements and used to provide a calibrated voltage measurement. The work has led to a patent application and new work is focused on expanding the sensor to three phase monitoring.

Microwave drying for food and pharmaceutical products: In a research project sponsored by EnWave Corporation, the design of microwave heating applicators was investigated. The research objectives were to determine how to design the microwave cavity to create uniform heating with arrays of 1.2 kW microwave sources. Multiphysics modeling was used to investigate both electric and thermal profiles in the load.

Blood pressure sensor for portable health monitoring applications: In a current research project sponsored by Questek Development Corporation, the design of a blood pressure sensor for portable health monitoring applications is being investigated. Measurement methods using optical and ultrasound sensors combined with a vascular model are being evaluated to implement the blood pressure sensor.

ENMM Division (Markley)

Research areas:

- metamaterial structures
- microwave circuits
- antennas and antenna arrays
- propagation through complex media

Members and Partners:

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Dan Roycroft	Zone4 Systems		chip timing, event registration

Summary of funding record:

- NSERC Discovery Program (\$110,000)
- NSERC Engage Program (\$25,000)
- Other (\$25,000)

Summary of training record:

Master and PhD students:

Iman Aghanejad PhD, metamaterial characterization

Asif Al Noor MASc, leaky wave antennas

Masoud Ahmadi MASc, low profile antennas

Undergraduate Students/Co-op:

Paul Jubinville, microwave circuits

Andre Vandenberg, software coding

Cameron McDermid, magnetohydrodynamic microfluidics)

Summary of publications record:

- Refereed journal articles: (11)
- Refereed conference proceedings: (9)
- Posters and abstracts: (7)
- Technical reports/other: (1)

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

L Markley, AMH Wong, Y Wang, and GV Eleftheriades, "Spatially shifted beam approach to subwavelength focusing," Physical Review Letters 101 (11), p. 113901, 2008. **IF 7.5**

Y Wang, AMH Wong, L Markley, AS Helmy, and GV Eleftheriades, "Plasmonic meta-screen for alleviating the trade-offs in the near-field optics," Optics Express 17 (15), pp. 12351-12361, 2009. **IF 3.5**

L Markley and GV Eleftheriades, "Two-dimensional subwavelength focusing using a slotted meta-screen," IEEE Microwave and Wireless Components Letters 19 (3), pp. 137-139, 2009. **IF 1.7**

L Markley and GV Eleftheriades, "A negative-refractive-index metamaterial for incident plane waves of arbitrary polarization," IEEE Antennas and Wireless Propagation Letters 6, pp. 28-32, 2007. **IF 1.6**

L Markley and GV Eleftheriades, "Two-dimensional subwavelength-focused imaging using a near-field probe at a $\lambda/4$ working distance," Journal of Applied Physics 107 (9), p. 093102, 2010. **IF 2.2**

Examples of technological projects/community involvement:

Radio-frequency identification (RFID) is a growing technology with a world market currently evaluated at \$9 billion. As passive RFID chip tags have become smaller and cheaper, they have been introduced into many different industries, including the timing and tracking of sporting race participants. I am currently working on a project with a Canadian tech company to design a specialized antenna for robust easy-to-deploy RFID race timing systems. This will enable organizers to achieve accurate race results quickly and with minimal staff oversight.

ENMM Division (O'Leary)

Research areas:

- Thin-films
- Optical properties
- Electronic materials
- Electron devices

Summary of funding record:

- NSERC Discovery Program (\$200,000)
- NSERC Engage Program (\$100,000)
- MITACS (\$200,000)

Summary of training record:

Postdoctoral Fellows:

Walid A. Hadi (electron transport in compound semiconductors)

Erfan Baghani (electrical properties of defects in wide energy gap compound semiconductors)

Master and PhD students:

Name	Degree	Time Supervised	Thesis Title and Date of Defense
T.H. Nguyen (sole supervisor)	M.A.Sc.	December 1998 – June 2000	A theory of occupation statistics for disordered semiconductors with applications <u>Date Defended:</u> June 14, 2000
S.M. Malik (co-supervised- L. Benedicenti)	M.A.Sc.	February 2000 – February 2002	Density of states and joint density of states analysis of hydrogenated amorphous silicon <u>Date Defended:</u> February 1, 2002
F. Wang (sole supervisor)	M.A.Sc.	January 2000 – October 2002	Interference analysis of a multihop packet radio network employing direct-sequence spread-spectrum signaling <u>Date Defended:</u> October 4, 2002
Z. Lou (sole supervisor)	M.A.Sc.	September 2001 – December 2003	Radio terminal distribution and the performance of ad hoc packet radio networks <u>Date Defended:</u> December 3, 2003
V. Aravamudhan (sole supervisor)	M.A.Sc.	January 2001 – December 2003	Flat panel digital x-ray image detectors <u>Date Defended:</u> December 9, 2003
F. Orapunt (sole supervisor)	M.A.Sc.	May 2002 – December 2003	Optical absorption in hydrogenated amorphous silicon <u>Date Defended:</u> December 18, 2003
P. Zhou (sole supervisor)	M.A.Sc.	September 2001 – November 2004	On the use of multiuser detectors in an ad hoc multipacket radio network <u>Date Defended:</u> November 17, 2004
K. Narayanaswamy (sole supervisor)	M.A.Sc.	September 2001 – December 2004	Fading and the performance of ad hoc multipacket radio networks <u>Date Defended:</u> December 7, 2004
L. Lai (sole supervisor)	M.Eng.	January 2003 – January 2005	History and Trends in Microelectronics <u>Date Defended:</u> January 27, 2005
B. Fogal	M.Sc.	September 2000 –	Electronic Transport Properties of Stabilized

(co-supervised with S.O. Kasap)	(UofSK)	March 2005	Amorphous Selenium X-Ray Photoconductors Date Defended: March 2, 2005
R. Narayanasamy (co-supervised with W.M. Misskey)	M.Eng.	May 2002 – March 2005	A Survey of Mobile Data Technologies Date Defended: March 22, 2005
K.S. Pallavi (sole supervisor)	M.A.Sc.	September 2002 – September 2005	X-ray photoconductors and their use within direct conversion flat panel digital x-ray image detectors Date Defended: September 13, 2005
T.M. Mok (sole supervisor)	M.A.Sc.	September 2002 – January 2006	On the optical response of amorphous semiconductors Date Defended: January 19, 2006
T. Dinh (sole supervisor)	M.Eng.	October 2006 – August 2007	Impact of wind forecasting variability on the system's operating cost Date Defended: August 13, 2007
I. Khan (sole supervisor)	M.A.Sc.	September 2005 – August 2007	Performance analyses of ad hoc packet radio networks Date Defended: August 28, 2007
M.I. Haider (sole supervisor)	M.Eng.	September 2006 – September 2007	Ontario power generation and its future Date Defended: September 14, 2007
Md. Rahman (sole supervisor)	M.Eng.	May 2007-January 2008	Materials and devices for renewable energy technologies from the solar source Date Defended: January 28, 2008
S.H. Zia (sole supervisor)	M.Eng.	May 2008-December 2008	An investigation of an in-plane bulk titanium microneedle for transdermal drug delivery Date Defended: October 31, 2008
W. Lu (sole supervisor)	M.A.Sc.	September 2006-February 2009	Models for the optical dispersion relations of crystalline and disordered semiconductors Date Defended: February 6, 2009
G. Gill (sole supervisor)	M.Eng.	September 2008-May 2009	Great expectations: Solar cells and the emergence of the photovoltaics industry Date Completed: May 22 2009
J.J. Thevaril (sole supervisor)	Ph.D.	January 2008 – March 2011	The optical response of hydrogenated amorphous silicon Date Defended: March 7, 2011
P.K. Guram (sole supervisor)	M.A.Sc.	September 2009 – October 2011	Modeling solar cells with recombination Date Defended: October 25, 2011
R. Cheekoori (sole supervisor)	M.A.Sc.	January 2010 – January 2012	Electron transport in wide energy gap semiconductors Date Defended: January 20, 2012
F. Orapunt (sole supervisor)	Ph.D.	September 2004 – February 2012	Optical transitions in amorphous semiconductors Date Defended: February 8, 2012
E. Baghani (sole supervisor)	Ph.D.	May 2009-September 2012	Electrical properties of dislocations within the nitride based semiconductors gallium nitride and indium nitride Date Defended: September 26, 2012
S.B. Minar	M.A.Sc.	September 2010 –	An optical functional analysis of amorphous

(sole supervisor)		November 2012	semiconductors Date Defended: November 23, 2012
S.-H.D.H. Manuel (sole supervisor)	M.A.Sc.	September 2011 – September 2013	A performance analysis of planar and radial pn junction based photovoltaic solar cells Date Defended: September 27, 2013
S. A. Chowdhury (sole supervisor)	M.A.Sc.	September 2011 – December 2013	An analysis of the optical response of amorphous semiconductors with distributions of defect states Date Defended: December 16, 2013
K.J. Schmidt (sole supervisor)	M.A.Sc.	September 2011 – January 2014	On the material structure of hydrogenated nanocrystalline silicon Date Defended: January 10, 2014
W.A. Hadi (co-supervised with R. Muscedere)	Ph. D.	March 2010 – January 2014	The electron transport within the wide energy gap compound semiconductors gallium nitride and zinc oxide Date Defended: January 20, 2014
J.K.H. Nickel (co-supervised with M. Neuman)	M.A.Sc.	January 2012 – June 2014	Shear-driven fluid flow in an asymmettically oscillating cylindrical conduit: A viable novel fluid pump Date Defended: June 30, 2014
A.K. Salhotra (sole supervisor)	M.A.Sc.	September 2012 – August 2014	A performance analysis of a direct- conversion digital X-ray imager Date Defended: August 28, 2014
J. Laumer (sole supervisor)	M.A.Sc.	September 2013 – December 2014	A Raman and scanning electron microscope analysis of magnetron sputtered thin-film carbon Date Defended: December 1, 2014
A.A.A. Bhat (sole supervisor)	M. Eng.	September 2014 – June 2015	Jamming in wireless communication networks Date Presented: June 22, 2015
P.C.L. Chaw (co-supervised with W.G. Dunford)	M.A.Sc.	September 2012 – August 2015	An approach to reduce the effect of partial shading on photovoltaic modules Date Defended: August 21, 2015
B. Patel	M.A.Sc.	September 2013 – September 2015	X-ray diffraction and Raman spectroscopy of pulsed light irradiated nanocrystalline silicon Date Defended: September 11, 2015

Undergraduate Students/Co-op: The students who received a Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarship are indicated with the *.

Name	Time Supervised	Research Project
L. Deutscher*	May– August 1999	Screening in disordered semiconductors
B.J. Fogal*	May-August 2000	Optical processes in amorphous semiconductors
P. Laforge*	May-August 2001	Error function asymptotic expressions
A Rapley*	May-August 2002	Interference analysis of a packet radio network
M. Lyster*	May-August 2002	Interference analysis of a packet radio network
L Warwaruk	May-August 2002	Interference analysis of a packet radio network
M. Deutscher*	May-August 2003	Instability in amorphous silicon
E. Poppleton	May-August 2003	Instability in amorphous silicon

D. Chamberlain	May-August 2004	A traffic analysis of a packet radio network
M. Hurajat*	May-August 2008	Optical dispersion relations for amorphous semiconductors
M. Bethune-Waddell	September 2012-April 2013	Experimental determination of the electron lifetime in silicon carbide nano-composites
J. Andrews*	May-August 2013	Measurements of the optical absorption spectrum using photothermal deflection spectroscopy

Summary of publications record:

- Books and chapters: 3
- Refereed journal articles: 76
- Refereed conference proceedings: 24
- Posters and abstracts: 52

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

- (1) **S.K. O’Leary**, S.R. Johnson, and P.K. Lim, *The relationship between the distribution of electronic states and the optical absorption spectrum of an amorphous semiconductor: An empirical analysis*, **Journal of Applied Physics**, Volume **82**, pages 3334-3340, 1997.
- (2) **S.K. O’Leary**, B.E. Foutz, M.S. Shur, U.V. Bhapkar, and L.F. Eastman, *Electron transport in wurtzite indium nitride*, **Journal of Applied Physics**, Volume **83**, pages 826-829, 1998.
- (3) B.E. Foutz, **S.K. O’Leary**, M.S. Shur, and L.F. Eastman, *Transient electron transport in wurtzite GaN, InN, and AlN*, **Journal of Applied Physics**, Volume **85**, pages 7727-7734, 1999.
- (4) **S.K. O’Leary**, B.E. Foutz, M.S. Shur, and L.F. Eastman, *Steady-state and transient electron transport within the III-V nitride semiconductors, GaN, AlN, and InN: A review*, **Journal of Materials Science: Materials in Electronics**, Volume **17**, pages 87-126, 2006.
- (5) E. Baghani*, **S.K. O’Leary**, I. Fedin, D.V. Talapin, and M. Pelton, *The Journal of Physical Chemistry Letters, Auger-limited carrier recombination and relaxation in CdSe colloidal quantum wells*, **The Journal of Physical Chemistry Letters**, Volume **6**, pages 1032-1036 (2015).

DBR Technology Center

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Canada

Tel. 780-463-8638
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October 20, 2015

Subject: Support letter for establishment of the Materials and Manufacturing Research Institute (MMRI)

Dear Dr. Kenneth Chau:

Schlumberger is the world's leading supplier of technology, integrated project management, and information solutions to the international oil and gas exploration and production industry. The company employs 105,000 people of over 140 nationalities working in approximately 85 countries, providing the industry's widest range of products and services. Schlumberger's products and services range from seismic acquisition and processing; drilling bits and drilling fluids; directional drilling and drilling services; formation evaluation, well testing and fluid characterization; to well cementing and stimulation; artificial lift, well completions and well intervention; and consulting, software and information management. With 125 research and engineering facilities worldwide, we place strong emphasis on developing innovative technology that adds value for our customers. For more than 80 years, we have been pioneers of such technology and innovation. In 2014, we invested \$1.21 billion in R&E.

As the market leader in the oil and gas service industry, we continually endeavour towards enhancing our R&D activities, to both provide greater efficiencies in our processes and an ever-superior product for our consumers. As part of these activities and experience, we well recognize the need for knowledge-based, advanced materials and manufacturing practices to arrive at cost-effective and optimum practical solutions. Aligned with this vision, we commend and welcome the initiative taken by UBC's Okanagan campus to establish an institute for materials and manufacturing research and development. We envision that the collective expertise that this institute will bring from a large number of pure and applied science departments of UBC will be one of the first in its kind and can assist leading companies in the region, Canada, and beyond to remain competitive. This opportunity will be further enhanced by benefiting from cutting edge collaborative university-industry research projects and accessing the state-of-the-art research facilities a UBC, along with world-class students who will be tomorrow's employees and leaders in industry and academia.

Our anticipated contribution in the primary stages of establishment of this institute will include direct advice on defining strategic project topics that can be of interest to our industry sector as a whole. In the longer run, once new collaborative projects are established, we anticipate an active participation of our R&D staff in different phases of research with faculty, donating test materials, assisting in training students in complex science and engineering problems, along with collaboration with other industrial sectors for bigger initiatives nationally and internationally.

It is clear that electromagnetics and nanoscale materials research will continue to play a pivotal role in the development of enhanced tools, new technologies, and optimized workflows for the oil and gas industry. Please contact me if I can provide further information or assistance to support the establishment of the MMRI.

Best regards,



Vincent Sieben, Ph.D., P.Eng.
Senior Research Scientist

Novel Fluid Analysis
Schlumberger Canada Ltd.
E-mail: vsieben@slb.com
Phone: (780) 577-8345
Mobile: (780) 292-1221

PNMM Division

- **Projected research areas**

- ✓ Characterization of materials by Raman spectroscopy
- ✓ Atomistic quantum mechanical modeling of ordered materials
- ✓ Medical imaging
- ✓ Polymer gels
- ✓ Polymer nanomechanics
- ✓ Polymer hydration
- ✓ Controlled radical polymerization
- ✓ Organometallic polymer catalysts
- ✓ Polymer materials from food sources
- ✓ Plant genomics and metabolomics

Division members and partners:

At UBC Okanagan (Vancouver members of all divisions are listed in a separate document):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Gino DiLabio	Chemistry	Computational chemistry (FIP 248)	Computational chemistry, radical chemistry, nanostructured surface chemistry
Andrew Jirasek	Physics	Medical Physics (SCI 334)	Medical physics, radiation oncology, Raman spectroscopy
Isaac Li	Chemistry	Single Molecular Cellular Biophysics Lab	DNA and polymer-based smart nano-biomaterials, single molecule biophysics, cell mechanics and mechanobiology
Kevin M. Smith	Chemistry	1 st OTM Lab	Organometallic Chemistry, Metal-Mediated Radical Reactivity, Catalysis
Susan J. Murch	Chemistry	Plant Secondary Metabolite Analysis Team (PlantSMART)	Natural chemicals, bioproducts, plant-environment responses
Michael Deyholos	Biology		Genomics, biomaterials
John Hopkinson	Physics		Condensed matter theory: geometrically frustrated magnetism

Outside UBC (universities/research organizations/industry):

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Andrew Myles	National Institute for Nanotechnology	Innovation support	Polymer chemistry, nanomaterials, business development
Paolo Mussone	Northern Alberta Institute of Technology (NAIT)	Ingenuity Lab	Polymer from natural materials, Strand board from bulk, excess wood materials; Applied bio/nanotechnology
Karen Stoeffler	National Research Council Canada	Industrial Materials Institute	Microbiology, Applications to natural materials
Denis Rho	National Research Council Canada	Industrial Materials Institute	Bio-composites, Natural fibers
Johanne Denault	National Research Council Canada	Industrial Materials Institute	Bio-composites, processing
Cagri Ayranci	University of Alberta, Department of Mechanical Engineering	Multifunctional Fibrous Composites Laboratory	Bio-nano-composites, Mechanical testing, Manufacturing
Jessika Trancik	Massachusetts Institute of Technology (MIT)	Trancik Lab	Environmental impacts; Clean energy strategic development and decision-making

Summary of funding:

NSERC/SSHRC/CI HR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$13,684,624	\$2,136 138	\$5,320,200	\$35, 639

Summary of training record:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/ Visiting Scholar	Undergraduate Research Assistant
14	48	39	7	114

Summary of publications record:

Books/Chapters/ Editorials	Journals	Conference Proceedings	Abstracts/ Posters	Patents	Technical Report/ Other
26	405	95	471	9	8

Anticipated activities including interaction with other divisions of the Institute, and sample facilities/ research infrastructure (Maximum one page)

Anticipated activities: The PNMM division will bring together faculty and student researchers to work collaboratively on developing innovative solutions to real-world materials and manufacturing issues in leading industries where biodegradable and natural materials can find functionality. Primarily, through existing collaborations and industrial contacts, the division will establish a critical mass of research in broad themes: Polymer/natural materials derived from plant sources, modeling physical properties and functionality of the components of materials, catalysts that can be used to generate new polymers, and susceptibility of polymer materials to damage (e.g. by exposure to radiation). As reflected in their individual CVs, the founding (core) members of PNMM have a long history of research excellence in developing, characterizing, and modelling materials for structure-property relationships. Evidence of this success is found in the 405 journal articles that have been published over the past ten years, with a significant research funding record. PNMM will also work closely with other divisions of the institute and industry sectors to establish joint efforts on design and fabrication of emerging “multi-functional” materials in a wide range of applications. PNMM is also expected to contribute notably at the institute to training opportunities in inter-disciplinary areas of materials and manufacturing, including participation in major training grants such as NSERC CREATE and initiating joint graduate courses with other divisions.

Infrastructure: The initial infrastructure for the PNMM will readily come from within the research groups of the founding members. Examples include advanced gas chromatogram - mass spectrometer instruments and plant growth chambers (Murch), chemical synthesis facilities (Smith), high-performance computing (DiLabio/Compute Canada), and confocal microscopy (Li). Furthermore, the division house large collections of varieties of plants, including breadfruit, from which natural polymers can be easily extracted.

Biography of the Division Lead (interim)



Gino DiLabio *Head of the Department of Chemistry, UBC Okanagan Campus.*

DiLabio's research centres on the behaviour of radicals at interfaces, including the damaging effects radicals on biological materials, and on the development of computational tools to simulate these systems. Prior to joining UBC, Professor DiLabio was an associate director and senior research scientist with the National Institute for Nanotechnology in Edmonton, Alberta, an Institute to which he remains affiliated through a fellowship appointment. He has published more than 130 papers, patents, and book chapters related to free-radical chemistry, nanostructured materials, computational modeling and organic chemistry.

CV for PNMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Gino A. DiLabio	University of British Columbia, Department of Chemistry		Computational chemistry, radical chemistry, nanostructured surface chemistry

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Invited Conference Presentations	Conference Posters/oral presentations	Patents	Technical Report/Other
2	126	51	75	5	0

Sample Publications: Please include sample of most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

“Noncovalent interactions in density-functional theory”, Gino A. DiLabio and Alberto Otero-de-la-Roza, in Reviews in Computational Chemistry, Kenny Lipkowitz Ed., Wiley and Sons, 2015. arXiv preprint arXiv:1405.1771.

“Physical and Chemical Principles in Molecular Electronics” Adam Bergen and Gino A. DiLabio, Ed. Zerong Wang, Encyclopedia of Physical Organic Chemistry, Wiley. 2015.

b) Journals

“Field Regulation of Single Molecule Conductivity by a Charged Atom”, P. G. Piva, G. A. DiLabio, J. L. Pitters, J. Zikovsky, M. Rezeq, S. Dogel, W. A. Hofer and R. A. Wolkow*, Nature, 2005, 435, 658-661.

“Experimental and Theoretical Studies of Trimethylene Sulfide-Derived Nanostructures on p- and n-Type H-Silicon(100)-2x1.” S. A. Dogel, G. A. DiLabio*, J. Zikovsky, J. L. Pitters, and R. A. Wolkow, Journal of Physical Chemistry C, 2007, 111, 11965-11969.

“Theoretical Study of Work Function Modification by Organic Molecule-Derived Linear Nanostructures on H-Silicon(100)-2x1.” A. Y. Anagaw, R. A. Wolkow, and G. A. DiLabio*, Journal of Physical Chemistry C, 2008, 112, 3780-3784.

“Transport Properties of Thiophenes: Insights from Density-Functional Theory Modeling Using Dispersion-Correcting Potentials.”, Sean A. McClure, Jillian M. Buriak, and Gino A. DiLabio, *Journal of Physical Chemistry C*, 2010, 114. 10952-10961. Issue cover.

“Indications of Field-Directing and Self-Templating Effects on the Formation of Organic Lines on Silicon.” Janik Zikovsky, Stanislav A. Dogel, Mark H. Salomons, Jason L. Pitters, Gino A. DiLabio* and Robert A. Wolkow, *J. Chem. Phys.*, 2011, 134, 114707.

c) Invited Talks

“Computational Modeling of Organic Nanostructures on Silicon”, Joint Workshop on Nano Simulation, Canadian Embassy, Tokyo, Japan, February 24, 2006.

“Linear Organic Nanostructure on Silicon Surfaces: Radical Lines and Dopant-Mediated Chemistry”, 10th International Symposium on Organic Free Radicals/3rd Symposium on Radical Chemistry, Heron Island, Australia, Aug. 3-9, 2008.

“Organic Nanostructures on Silicon Surfaces: An Interesting Platform for Applying Some Well-Known Radical Chemistry”, University of Rome “Tor Vergata”, Roma, Italy. June 15, 2009.

“Linear Radical Nanostructures of Nitroxides on Silicon Surfaces”, Pacificchem, Honolulu, Hawaii, Dec. 15-20, 2010.

“Modeling Noncovalent Interactions using Density-Functional Theory with Dispersion-Correcting Potentials.”, 96th Canadian Chemistry Conference, Québec City, QC, May 26-30, 2013

d) Conference Poster/Oral Presentations

“Computational Modeling of Organic Nanostructures on Silicon Surfaces”, NanoForum Canada, June 20-22, 2006, University of Alberta, Edmonton, Alberta, Canada.

“Calculations of Electron Transport through Substituted Benzenes.” M. Smeu, R. A. Wolkow, and G. A. DiLabio*, 90th Canadian Chemistry Society Conference, Winnipeg, Manitoba, Canada, May 26-30, 2007.

”Turning the Corner” on Controlled Molecular Nanostructure Formation on Hydrogen-Terminated Silicon Surfaces”, 235th American Chemical Society National Meeting, New Orleans, Louisiana, USA, April 6-10, 2008.

“Theoretical Study of Work Function Modification by Organic Molecule-Derived Linear Nanostructures on H-Silicon(100)-2×1.” A. Y. Anagaw, R. A. Wolkow and G. A. DiLabio*, 91st Canadian Chemistry Conference, Edmonton, Alberta, Canada, May 24-28, 2008.

“Theoretical and Experimental Investigation of Radical Molecular Arrays on Hydrogen-Terminated Silicon(100)-2×1.” Y. Shimoi, G. A. DiLabio*, S. A. Dogel, S. Lin, and K. U. Ingold, 91st Canadian Chemistry Conference, Edmonton, Alberta, Canada, May 24-28, 2008

e) Patents

P1. “Chain-breaking Antioxidants”, D. A. Pratt, L. Valgimigli and G. A. DiLabio. U.S patent no. 6,835,216, December 28, 2004, and additional patents.

P2. – P3. “Electrostatically Regulated Atomic Scale Electroconductivity Device”, U.S. 8,076,668 B2. granted Dec 13, 2011. , March 8, 2005. A related patent application has been filed. (US 2012-0013324 A1)

P4. “Atomistic Quantum Dots”, U.S. provisional patent filed June 17, 2008.

P5. “Asphaltene components as organic electronic materials”, U.S. patent application #13/579968 filed May 5, 2011 and WO/2011/137508 and CA 2790520 A1.

Past and current HQP training history (2005-2015)

Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
5	3	6	2	11

Details:

Graduate Students

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
J. van Santen	MSc (Chem)	09/2015		Supervisor
C. Livingston*	MSc (Chem)	01/2015	04/2015	Co-supervisor
S. Sinha ^a	PhD (Chem)	08/2009	04/2012	Co-supervisor
S. McClure ^b	PhD (Chem)	08/2009	04/2011	Co-supervisor
Z. S.-Yazdi	PhD (Phys)	08/2010	05/2014	Co-supervisor
A. Brazeau ^c	MSc (Chem)	09/2004	04/2007	Co-supervisor
M. Smeu ^d	MSc (Phys)	09/2005	09/2007	Supervisor

A. Anagaw ^e	MSc (Phys)	09/2005	09/2007	Supervisor
O. Clarkin ^f	MSc (Chem)	09/2004	09/2006	Supervisor

Post-doctoral fellows/Research Associates

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
A. Otero de la Roza	Research associate	01/2014	In prog.	Supervisor
M. Koleini ^g	pdf	10/2012	04/2014	Supervisor
E. Torres ^h	Research associate	12/2010	12/2013	Supervisor
J.-L. Carreo-Macedo ⁱ	pdf	01/2011	04/2011	Supervisor
I. D. Mackie ^j	pdf	01/2009	04/2011	Supervisor

Undergraduate students Supervised

Student Name	Program Type	Year		Supervisory Role (supervisor, co-supervisor, committee member)
		Start	Finish	
J. Gibbs	UG (Chem)	09/2015	04/2016	Supervisor
S. Rahemtulla	UG (Chem)	09/2015	04/2016	Supervisor
S. Rahemtulla	USRA	04/2015	08/2015	Supervisor
Andre Mottier	UG (Chem)	08/2014	05/2015	Co-Supervisor (w. K. M. Smith)
Jeff van Santen ^q	UG (Chem)	08/2014	05/2015	Supervisor
P. Johnson ^k	UG (Chem)	05/2008	08/2009	Co-supervisor
O. Clarkin ^l	UG (Chem)	05/2003	09/2004	Supervisor
C. Rowley ^m	UG (Chem)	09/2004	04/2005	Co-supervisor
G. Snider ⁿ	UG (Chem)	09/2004	04/2005	Co-supervisor
E. Johnson ^o	UG (Chem)	04/2003	04/2004	Supervisor
D. Pratt ^p	UG (Chem)	08/1998	04/1999	Co-supervisor

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$175 000	\$345,700	\$1 379 235	\$2 619 678

Details:

Granting Agency	Subject	COM P	\$ per Year (# years)	Year	Principal Investigator	Co-Investigator(s)
Compute Canada	Dispersion Correcting Potentials	C		2015	G. DiLabio	
NSERC	Radicals at Interfaces	C	35 000 (5)	2014	G. DiLabio	
nanoAlberta	Nanoparticle biodistribution	NC	206 667(3)	2012	G. DiLabio	H. Semple
Compute Canada	Dispersion Correcting Potentials	C	55 000 (1)	2014	G. DiLabio	
Compute Canada	Dispersion Correcting Potentials	C	119 700 (1)	2013	G. DiLabio	
Compute Canada	Dispersion Correcting Potentials	C	101 100 (1)	2012	G. DiLabio	
Centre for Oil Sands Innovation	Mechanical and Chemical Properties of Asphaltene Surface Deposits	C	121 000 (3)	2010	G. DiLabio	M. McDermott M. Gray
Program for Energy Research and Development	Ab initio Study of Ring-Opening Reactions Relevant to Oil Sands	C	72 422 (3.4)	2005	G. DiLabio	

National Research Council	A Chemical Physics Approach to Construction of Molecular Devices	NC	174 841 (3)	2006	R. Wolkow	G. DiLabio J. Pitters
National Research Council	Contacts at Silicon Surfaces and Control of Single Atom Charge State	NC	199 555 (3)	2006	R. Wolkow	G. DiLabio J. Pitters
Compute Canada	Dispersion Binding in Electronic Materials: Pentacene	C	70 000 (1)	2008	G. DiLabio	
Defence Research and Development Canada	Computational Simulations Towards the Detection and Identification of Nerve Agents	NC	75 000 (2)	2009	G. DiLabio	
National Research Council	Hybrid Silicon-Molecule Devices	NC	496 870 (3)	2009	R. Wolkow	G. DiLabio J. Pitters
NSERC	SGP: Design of synthetic antioxidants	C	137 787 (1)	2000	J. Wright	G. DiLabio T. Durst K. Ingold R. Barclay D. Miller B. Pappas

Evidence of Research Impact

Dispersion-Correcting Potentials (DCPs) (Papers 6, 11, 13, 20, 33, 58, 60 with 250 total citations, DCP website page loads > 9400)

The most widely used tool in computational chemistry and physics is density-functional theory (DFT) owing to its relative speed & accuracy as compared to other methods. Until just a few years ago, most implementations of DFT were unable to accurately model most types of noncovalent interactions (NCIs). For example, the world's most popular DFT-based method in computation chemistry - B3LYP - predicts a mean absolute error (MAE) of > 220% on a set of 66 dimer complexes in which the constituents interact noncovalently. This is problematic because a proper description of NCIs is required in order to many chemical and physical properties, including the correct mechanisms, rates and thermodynamic properties of most chemical reactions. DCP is the general name we use to describe the atom-centered potentials my group has developed to correct the poor treatment of NCIs by conventional DFT methods like B3LYP. We showed that the massive MAE in NCI binding energies of a set of 66 complexes predicted by B3LYP can be reduced from >220% to 3.9% through the application of DCPs, making the B3LYP-DCP approach one of the best in the world for this application. Most recently, we found that DCPs can improve the modeling of covalent bonding interactions as well as NCIs: For

a specific DFT-based method, the mean error in NCIs was reduced from 61% to 4.5% and the mean signed error in bond dissociation enthalpies, a covalent property of central importance in chemistry, was reduced from -3.0 kcal/mol to -0.9 kcal/mol. No other approach to correcting existing DFT-based methods has demonstrated this functionality. Overall, my work in this area has enabled chemists to develop insights into the role of NCIs in a variety of chemical processes and has provided the computational chemistry community with an alternate approach for the accurate treatment of NCIs in modelling. Our expectation is that DCPs will be impactful in coming years as their ability to improve the modeling of covalent behaviour becomes broadly realized.

Noncovalent Interactions in DFT (Papers 3, 9, 12, 14, 27, 45, 47 and book chapter 1; total citations 506)

In efforts related to (but distinct from) my DCP work, my group has been working to understand the limitations of DFT-based methods with respect to the treatment of NCIs. This work includes understanding the pitfalls associated with the use of various methodologies for modeling NCIs, understanding basis set effects, and generating high-level reference NCI data. The most significant impact of this body of work comes from my review articles and paper 47, which provide novice and expert users with the necessary background to understand the relationship between DFT and NCIs. I anticipate that our most recent work in this area, book chapter 1 which will be published in 2015 in the venerable series *Reviews of Computational Chemistry* will be one of the most important works in this area because it is the most comprehensive review of its type presently available.

Toward a complete mechanistic and kinetic picture of radical-induced protein damage. (Papers 1, 4, 7, 8, 10, 15, 18, 19, 21, 23, 26-31, 34, 35, 37, 42, 49, 52, 55, 56, 59 with > 350 total citations)

We have developed a considerable body of work in which we have worked to develop an understanding of the fundamental thermodynamic, mechanistic and kinetic aspects of organic radical reactions, with particular focus on hydrogen atom transfer (HAT) reactions. Our work has elucidated the role of solvent, substrate structure, abstracting radical structure, and the influence of NCIs on rates and selectivity of hydrogen abstractions from peptide model compounds by oxygen centered radicals. In addition to providing insights that allows us to develop a “bottom-up” understanding of the susceptibility of proteins to radical degradation, our work has implications for selectivity in C-H functionalization in organic synthesis processes. One of our most impactful works in this area is the elucidation of the role of secondary orbital interactions in HAT reactions. Paper 42 (98 citations) demonstrated that the interactions between lone pair-pi and pi-pi orbitals are significant in HAT. This work has influenced the interpretation of kinetic results in a number of industrially and biologically important HAT processes.

CV for PNMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Isaac T.S. Li	University of British Columbia, Department of Chemistry	Single-Molecule Cell Biophysics Lab	DNA and polymer-based smart nano-biomaterials, single molecule biophysics, cell mechanics and mechanobiology

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
2	17	17	20	0	0

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials

J.K. Li, I.T.S. Li, R.M.A. Sullan, S. Zou, Y. Sun, and G.C. Walker, (2012) “Polymer nanomechanics” in “Comprehensive Polymer Science”, Editor: Martin Moeller, Elsevier, ISBN: 978-0-08-087862-1

b) Journals

F. Chowdhury, I.T.S. Li, B. Leslie, S. Doganay, R. Singh, B. Weida, S. Lee, J. Seong, J. Ma, N. Wang, T. Ha, (2015) “Single molecular force across single integrins dictates cell spreading”, Integrative Biology, 7: 1265-1271.

I.T.S. Li and G.C. Walker, (2011) “Signature of hydrophobic hydration in a single polymer”, PNAS, 108 (40): 16527-16532.

c) Conference Proceedings

I.T.S. Li, T. Ha, Y.R. Chemla, (2015) “Tracking rotation during leukocyte rolling reveals asymmetric adhesion”, Biophysical Society Meeting, 2015, Baltimore, MD, USA

I.T.S. Li, T. Ha, Y.R. Chemla, (2014) “Single molecule mechano-memory”, Biophysical Society Meeting, 2013, San Francisco, CA, USA

Past and current HQP training history (2005-2015)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
0	1	0	0	4

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles
Alice Troitskaia	PHD	2013-2015	I.T.S. Li, Y.R. Chemla	Single molecule characterization of DNA-based mechanical materials
Aline Arra	Undergrad	2014-2015	I.T.S. Li	Fluid control of cell motion in flow chamber
Ryan Migalla	Undergrad	2013-2015	I.T.S. Li	Development of microfluidic bacteria traps to study bacteria motility through porous materials
Ranjith K.R.	Undergrad	2007-2008	I.T.S. Li	Homologous modeling of binding between peptide and protein
Amir Manbachi	Undergrad	2006-2007	I.T.S. Li	Engineering fusion proteins by cassette approach

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$80,000	\$0	\$0	\$10,000

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
Centre for the Physics of Living Cells (NSF, USA)	Massively parallel fluorescence detection of single molecule mass and charge in electric field	\$10,000	2015	Isaac T.S. Li	

NSERC Postdoc Fellowship	N/A	\$80,000	2012-2014	Isaac T.S. Li	
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Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

“Single molecular force across single integrins dictates cell spreading” was a project I worked on in University of Illinois during my postdoc. The work was supported by NSERC PDF program as well as Centre for the Physics of Living Cells, a NSF physics frontiers centre, and is done in collaboration with 4 other labs in the centre.

Significance: Conventional polymer-based biomaterials supporting cell growth and proliferation focus on macroscopic material properties such as substrate elasticity, which cells sense and respond to. However, these bulk properties do not allow us to tease apart the underlying mechanisms of how cells sense its physical surroundings. In this study, I engineered a surface where the mechanical properties of individual adhesion molecules can be fine-tuned, in particular, the molecular force and molecular elasticity. We compared cellular response to molecular properties and to bulk elastic properties and showed that it is the molecular forces, not elasticity that cells sense, which controls cell spreading. This is one of the first works on controlling cellular behaviour at the single molecule level. The goal of my new lab in UBC is to use single molecule methods (AFM, optical tweezer, and singl-molecule fluorescence microscopy) to design and characterize smart polymer biomaterials and achieve controls over cellular behavior not possible by bulk materials or techniques. The long term goal is to be able to engineer smart surfaces that are extremely sensitive to cell surface receptor compositions, which enables separation and detection of different cell types in the blood, such as early stage metastatic cancer cells.

ENMM Division (John Hopkinson)

Research areas:

Geometrically frustrated magnetism
 Spin ice
 Spin liquids
 Heavy fermions
 Low dimensional systems
 High temperature superconductivity
 Strongly correlated electron systems
 Quantum criticality
 Quantum dots

Summary of training record:

- Master and PhD students: (Travis Redpath, Masters (defended Nov. 2013 at U of Manitoba), hyperkagome spin ice (frustrated magnetism))
- Undergraduate Students/Co-op:
- (Chris Garner, quantum dimer model (frustrated magnetism, spin liquid, current honours thesis), Albert Ai, artificial spin ice (frustrated magnetism, current honours thesis)
 Chris Garner, classical dimer models (frustrated magnetism, URA project, summer '14),
 Robin Taylor, Ising model on a new lattice (frustrated magnetism, Monte Carlo, honours thesis '13 (Brandon University)),
 Jarrett Beck, frustrated magnetism on new lattices using Monte Carlo: NSERC USRA summers '11, '12, Career focus: summer '10,
 Ian Russell, ferromagnetic local Ising model (frustrated magnetism, 7 weeks) summer '11
 Travis Redpath, spin ice and extended Heisenberg models, (frustrated magnetism) '09 summer-'10 summer (NSERC USRA + other funding)
 Justin Moes, local xy model and angle-dependent Kondo effect (frustrated magnetism and heavy fermions, NSERC USRA summers '09, '10)
 Alton Leibel, extended Heisenberg model (frustrated magnetism), 7 weeks summer '09
 Michael Urchuck, construction of physics demonstrations, summer '12
 Chris Sarkonak, construction of interactive physics displays, summer '09

Summary of publications record:

- Books and chapters: (give the total number)
- Refereed journal articles: (11)
- Refereed conference proceedings: (3)
- Posters and abstracts: (20 talks (some given multiple times), 13 posters, 9 posters or talks given by my students)
- Technical reports/other: (3 unpublished articles on arxiv.org, and Travis' thesis while submitted to the U of Manitoba graduate school has yet to be submitted for publication)

Below are five examples of most cited/impactful articles and patents from the above publications record: (please indicate the journal **Impact Factor**, and if you wish the number of citations)

- “Origin and consequence of an unpinned helical magnet: application to partial order in MnSi under pressure”, John M. Hopkinson and Hae-Young Kee, Physical Review B **79** 014421 (2009). (6 pages) 2009 Impact factor: 3.475 (8 citations)
- “Geometric frustration inherent to the trillium lattice, a sublattice of the B20 structure”, John M. Hopkinson and Hae-Young Kee, Phys. Rev. B 74 224441 (2006). (14 pages) 2006 Impact factor: 3.107(9 citations)
- “Clasical antiferromagnet on a hyper-kagome lattice” John M. Hopkinson, Sergei V. Isakov, Hae-Young Kee and Yong Baek Kim, Phys. Rev. Lett. **99** 037201 (2007). (4 pages) 2007 Impact Factor: 6.944 (25 citations)
- “LiV₂O₄: Frustration Induced Heavy Fermion Metal”, J. Hopkinson and P. Coleman, Phys. Rev. Lett. **89** 267201 (2002). (4 pages) 2002 Impact factor: 7.323 (26 citations)
- “Supersymmetric Hubbard operators”, P. Coleman, C. Pepin and J. Hopkinson, Phys. Rev. B **63** 140411(R), (2001). (4 pages) (11 citations) (Impact factors for Rapid communications are not generally available, but higher than Phys. Rev. B)

CV for PNMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Kevin M. Smith	UBC Okanagan, IKBSAS, Chemistry (Unit 3)	1 st OTM Lab	Organometallic Chemistry, Metal-Mediated Radical Reactivity, Catalysis

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
1	20	1	58	0	0

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

K. C. MacLeod, J. L. Conway, B. O. Patrick, K. M. Smith “Exploring Chromium(III)–Alkyl Bond Homolysis with $\text{CpCr}[(\text{ArNCMe})_2\text{CH}]$ Complexes” *Journal of the American Chemical Society* **2010**, 132, 17325-17334.

Y. Champouret, K. C. MacLeod, U. Baisch, B. O. Patrick, K. M. Smith,* R. Poli* “Cyclopentadienyl Chromium β -Diketiminato Complexes: Initiators, Ligand Steric Effects, and Deactivation Processes in the Controlled Radical Polymerization of Vinyl Acetate” *Organometallics* **2010**, 29, 167-176.

K. M. Smith, W. S. McNeil, A. S. Abd-El-Aziz “Organometallic-Mediated Radical Polymerization: Developing Well-Defined Complexes for Reversible Transition Metal–Alkyl Bond Homolysis” *Macromolecular Chemistry and Physics* **2010**, 211, 10-16.

K. M. Smith* “Recent Advances in Chromium Catalyzed Olefin Polymerization” *Current Organic Chemistry* **2006**, 10, 955-963.

A. N. Desonyer, B. Fartel, K. C. MacLeod, B. O. Patrick, K. M. Smith* “Ambient Temperature Carbon–Oxygen Bond Cleavage of an α -Aryloxy Ketone with $\text{Cp}_2\text{Ti}(\text{BTMSA})$ and Selective Protonolysis of the Resulting Ti–OR Bonds” *Organometallics* **2012**, 31, 7625-7628.

Past and current HQP training history (2005-2015)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
1	2	3	0	19

Details:

Student Name	Type	Years	Supervisor(s)	Main project/Thesis titles
Liming Tang	PDF	2005	K. M. Smith	Mixed N-aryl diketiminate chromium complexes
K. Cory MacLeod	PhD	2007-2012	K. M. Smith	Harnessing Radical Reactivity with Paramagnetic Organometallic Chromium Complexes
Wen Zhou	PhD	2009-2013	K. M. Smith	Electronic Structure and Single Electron Reactivity of Organochromium Complexes
Beata Fartel	MSc	2012-2014	K. M. Smith	Titanocene and Zirconocene Complexes for the Carbon-Oxygen Bond Cleavage of Lignin Model Compounds
Luke Moisey	MSc	2012-2015	K. M. Smith	Synthesis of Chromium Complexes with Bipyridine Radical Anions
Nicole Ayesu Nelson	MChem	2015-present	K. M. Smith	Breaking Carbon-Oxygen Bonds with Nickel Bipyridine Complexes
19 Undergraduate Students (36 projects)	BSc	2005-present	K. M. Smith	NSERC USRA (4), IKBSAS URA (3), Summer projects, non-USRA/URA (15), Honours Theses (14)

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$639,712	\$154,454	0	\$13,000

Details:

Agency and Program	Subject	Funding	Years	Principal Investigator	Co-Investigator(s)
CFI (Leaders Opportunity Fund) and BCKDF funds	Laboratory for Organometallic Chemistry of First-Row Metals (1 st OTM Lab)	\$154,454	2007	Kevin M. Smith	W. Stephen McNeil and Alaa S. Abd-El-Aziz
NSERC (Research Tools and Instruments)	UBC Chemistry X-Ray Diffractometer Upgrade	\$150,000	2015	Michael Fryzuk	Kevin M. Smith and 10 others
NSERC (Research Tools and Instruments)	Gel Permeation Chromatography (GPC) for Organometallic and Organic Polymer Analysis	\$49,063	2008	Alaa Abd-El-Aziz	Kevin M. Smith and W. Stephen McNeil
NSERC (Research Tools and Instruments)	Inert Atmosphere Glove Box for Organometallic Synthesis and Catalysis	\$65,649	2007	W. Stephen McNeil	Kevin M. Smith and Alaa Abd-El-Aziz
NSERC (Discovery Grant)	Mid-Valent Chromium Reagents for Controlled Radical Reactivity	\$175,000	2011-2015	Kevin M. Smith	
NSERC (Discovery Grant)	Mid-Valent Chromium Reagents	\$200,000	2005-2009	Kevin M. Smith	
UBCO (Individual Research Grant)	Chromium Catalysts for Radical Dimerization of Tryptophan	\$5,000	2011	Kevin M. Smith	

UBCO (Conference Grant)	2013 Alberta/BC Inorganic Discussion Weekend	\$3,000	2013	Kevin M. Smith	W. Stephen McNeil
UBCO (Travel Grant)	2012 Gordon Research Conference – Organometallic Chemistry	\$1,000	2012	Kevin M. Smith	
UBCO (Travel Grant)	2010 International Chemical Congress of Pacific Basin Societies (Pacifichem 2010)	\$2,000	2010	Kevin M. Smith	
CNC-IUPAC Travel Award	Organometallic Chemistry for Organic Synthesis 13	\$2,000	2005	Kevin M. Smith	
UBCO (Start-Up)	Mid-Valent Chromium Reagents	\$35,000	2006	Kevin M. Smith	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

K. Cory MacLeod, Julia L. Conway, Brian O. Patrick, Kevin M. Smith* **2010** “Exploring Chromium(III)–Alkyl Bond Homolysis with $\text{CpCr}[(\text{ArNCMe})_2\text{CH}](\text{R})$ Complexes”, *Journal of the American Chemical Society*, 132, 17325–17334.

The *Journal of the American Chemical Society* (JACS) is the flagship journal of the American Chemical Society and the world’s preeminent journal in all of chemistry and interfacing areas of science. In 2014, JACS had 489,761 total citations and an Impact Factor of 12.113.

This contribution studies the effect of steric hindrance on Cr–R bond homolysis. A wide range of Cr(III) hydrocarbyl complexes were prepared: the paper contains the X-ray crystal structures of twenty-three new compounds. The reversible cleavage of metal–alkyl bonds is the critical reactivity mode required for OMRP (Organometallic-Mediated Radical Polymerization). Well-defined chromium alkyl complexes can serve to both initiate and control the radical polymerization of difficult substrates such as vinyl acetate. This process is also important for other carbon-carbon bond-forming reactions catalyzed by first-row metals, such as nickel-based cross-electrophile coupling reactions for organic synthesis.

The unanticipated results of the study proved to be highly interesting. The efficiency of $\text{CpCr}(\text{Nacnac})$ as a trap for carbon-based radicals had disguised just how sensitive the Cr(III)–alkyl bonds were, as minute amounts of the Cr(II) homolysis product effectively shut down further decomposition through the persistent radical effect. However, when the Cr(III) neopentyl and benzyl complexes were treated with PhSSPh , the homolysis rates at room temp became evident as both Cr(II) and alkyl radicals were consumed. More surprising was the light sensitivity displayed under these conditions, with *all* of the Cr(III)–alkyl complexes being converted to Cr(III)–SPh by ambient lab light. We have since used this hitherto unsuspected light sensitivity to achieve photo-induced catalysis using a standard household compact fluorescent light bulb. The other unexpected ramification of this observation is that the non-thermally labile alkyl complexes are remarkably *air-stable* if kept in the dark.

CV for PNMM Division Member

Name	Organization/Department	Laboratory	Top Three Areas of Expertise
Michael K. Deyholos	University of British Columbia, Department of Biology		Natural fiber feedstocks, Plant genetics, Crop improvement

Publication Record (2005-2015)**Summary:**

Books/Chapters/Editorials	Journals	Conference Proceedings	Abstracts/Posters	Patents	Technical Report/Other
0	78	0	112	0	1

Sample Publications: Please include up to 5 most significant and relevant contributions under any of the following categories.

a) Books/Chapters/Editorials**b) Journals**

1. **Deyholos M.K.**, Potter S. (2014) Engineering bast fiber feedstocks for use in composite materials. *Biocatalysis and Agricultural Biotechnology*, 3:53-57.
2. Pinzon-Latorre, D., **Deyholos, M.K.** (2014) Pectinmethylesterases (PME) and Pectinmethylesterase Inhibitors (PMEI) Enriched during Phloem Fiber Development in Flax (*Linum usitatissimum*). *PLoS ONE* 9(8): e105386.
3. Mokshina N., Gorshkova T., **Deyholos M.K.** (2014) Chitinase-Like (CTL) and Cellulose Synthase (CESA) Gene Expression in Gelatinous-Type Cellulosic Walls of Flax (*Linum usitatissimum* L.) Bast Fibers. *PLoS ONE* 9(6): e97949.
4. Wang, Z., Hobson, N., Galindo, L., Zhu, S., Shi, D., McDill, J., Yang, L., Hawkins, S., Neutelings, G., Datla, R., Lambert, G., Galbraith, D.W., Grassa, C.J., Gerald, A., Cronk, Q.C., Cullis, C., Dash, P.K., Kumar, P.A., Cloutier, S., Sharpe, A.G., Wong, G.K.-S., Wang, J., **Deyholos, M.K.** (2012) The genome of flax (*Linum usitatissimum*) assembled *de novo* from short shotgun sequence reads. *The Plant Journal*, 72:461-473.
5. Roach, M.J., Mokshina, N.Y., Badhan, A., Snegireva, A.V., Hobson, N., **Deyholos, M.K.**, Gorshkova, T.A. (2011) Development of cellulosic secondary walls in flax fibers requires β -galactosidase. *Plant Physiology*, 156:1351-1363.

Past and current HQP training history (2005-2015)
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Summary:

Postdoctoral Fellow (PDF)	PhD	Master's	Research Associate/Visiting Scholar	Undergraduate Research Assistant
4	17	7	3	26

Details:

Student Name	Type	Years	Supervisor(s)
Rowshon Begam	PDF	2014-2015	M. K. Deyholos
Jizhe Cui	Visiting Scholar	2013-2014	M. K. Deyholos
Xin ZHao	Visiting Scholar	2013-2014	M. K. Deyholos
Louay Al-Ani	Visiting Scholar	2012-2013	M. K. Deyholos
Isadora Ribeiro	PhD	2014-present	M. K. Deyholos
Dinesh Adhikary	PhD	2013-present	M. K. Deyholos
Leonardo Galindo	PhD	2012-present	M. K. Deyholos
Ningyu Zhang	PhD	2012-present	M. K. Deyholos
Dan Zhu	PhD	2012-2015	M. K. Deyholos, Y. Zhu
Anupreeti Ramadoss	MSc	2011-2013	M. K. Deyholos, N. Kav

Kashfia Faruque	MSc	2011-2013	M. K. Deyholos
Lai To	MSc	2011-2013	M. K. Deyholos
Joshua McDill	PDF	2010-2012	M. K. Deyholos
Haiyan Zhuang	PhD	2010-2013	M. K. Deyholos, G. Wong
Shanjida Khan	PhD	2009-2015	M. K. Deyholos
David Pinzon	PhD	2009-2014	M. K. Deyholos
Ajay Badhan	PDF	2008-2010	M. K. Deyholos
Mingfeng Yang	PDF	2008-2009	M. K. Deyholos
Neil Hobson	PhD	2007-2013	M. K. Deyholos
Shiv Ganesh	MSc	2007-2011	M. K. Deyholos, N. Kav
Halina Kremer	MSc	2006-withdrawn	M. K. Deyholos, R. Weselake
Joseph Patton	PhD	2005-withdrawn	M. K. Deyholos
Gordon McNickle	PhD	2005-2010	M. K. Deyholos, J.C. Cahill
Ryan McKenzie	PhD	2005-2010	M. K. Deyholos
Abdur Rashid	PhD	2004-2010	M. K. Deyholos
Manjeet Kumari	PhD	2002-2010	M. K. Deyholos
Sue Koziel	MSc	2005-2009	M. K. Deyholos
Melissa Roach	PhD	2003-2009	M. K. Deyholos

Mohsen Mohammadi	PhD	2005-2008	M. K. Deyholos, N. Kav
Disa Brownfield	PhD	2000-2008	M. K. Deyholos, D. Gifford
Yuanqing Jiang	PhD	2003-2007	M. K. Deyholos
Naomi Hotte	MSc	2005-2007	M. K. Deyholos
Undergraduate Researchers (26)		2005-2015	M. K. Deyholos

Research funding (2005-2015)

Contribution Summary:

NSERC/SSHRC/CIHR	CFI or other Facility Grants	Industry Project Grants/ (MITACS/Direct Contract/Etc.)	Other (Internal Grants, Publication Grants, Etc.)
\$653,400	\$272,760	\$3,671,000	\$5,000

Details:

Agency and Program	Subject	Years	Principal Investigator(s)	Co-Investigator(s)
Genome Canada	FiCoGen (Fibre Composite Genomics)	2015-2017	D. Levin & S. Potter	M. Deyholos & 3 others

Agriculture & Agri-food Canada	Genetic improvement of drought tolerance in flax	2014-2017	R. Datla	M. Deyholos & 5 others
NSERC (Natural Sciences and Engineering Research Council of Canada)	The dynamic cell wall of plant fibers	2014-2018	M. Deyholos	
International KBBE (Knowledge-Based BioEconomy) Project	Flax for Improved Biomaterials through Applied Genomics (FIBRAGEN)	2011-2013	M. Deyholos & S. Hawkins	9 others
NSERC	Novel crops expressing bacteriophage tailspike proteins for reduction of foodborne pathogens at SOURCE	2010-2013	C. Szymanski	M. Deyholos &

CFI (Canadian Foundation for Innovation)	Instrumentation for Agricultural Lipid Biotechnology Research Program	2010	R. Weselake	M. Deyholos & 4 others
Genome Alberta	One Thousand Plants Project (1KP)	2009-2010	G. Wong	M. Deyholos
Genome Alberta/ Genome Canada	Total Utilization of Flax Genomics (TUFGEN)	2009-2013	S. Cloutier & G. Rowland	M. Deyholos & 13 others
Agriculture Canada	Cellulosic Biofuels Network (CBioN)	2008-2010	M. Gruber and S Laberge	M. Deyholos & 31 others
Genome Alberta/Alberta Energy	Alberta Flax Genomics Project	2008-2009	G. Wong	M. Deyholos
NSERC	Molecular mechanisms of phloem (bast) fibre development	2008-2013	M. Deyholos	
Alberta Agricultural Research Institute	Nanotechnology for Plant Transformation	2008-2010	N. Kav & M. Deyholos	

Genome Alberta/ Genome Canada	Designing oilseeds for tomorrow's markets	2006-2008	R. Weselake and W. Keller	M. Deyholos & 13 others
AI&S (Alberta Innovation & Science) Acceleration Fund	Alberta flax initiative	2006-2007	L. Hall and R. Weselake	M. Deyholos & 3 others
NSERC	Autoclave sterilizer for plant and animal biology	2006	M. Deyholos	5 others
NSERC	Quantitative real-time PCR for functional genomics and community ecology	2005	M. Deyholos	
AI&S	Plant proteomics infrastructure	2005	M. Cohen & M. Deyholos	
NSERC	Phloem development: a comprehensive genetic analysis	2003-2007	M. Deyholos	

Evidence of Research Impact

Among the sample publications listed above, please give one example of most impactful work; you can describe, e.g., the major scientific and technological development in that project, your individual contribution, knowledge/industry/community impact, journal impact factor, awards resulted from the work, etc.; If the work was collaborative, please indicate who were your collaborators. If you wish, you may also include an image/snapshot of the work (MAXIMUM one page).

I led the characterization of Canada's first plant genome sequence. Canada is the world leader in flax production, and besides its economic relevance, flax is also a fascinating scientific model for the synthesis of cell walls and lipids, and for an important form of genomic plasticity. After six years of lobbying, proposal writing, and performing foundational experiments, I secured a special provincial allocation and subsequently additional funds from Genome Canada to sequence the genome of flax. This was the first whole genome sequence assembly of a plant (and to my knowledge, of any higher eukaryote) led by Canadian researchers. For cost savings, the bulk of the sequencing was collaboratively outsourced to BGI-Shenzhen, but their direct involvement lasted less than two months and ended with the delivery of the raw sequence and a preliminary draft assembly in 2009. My students, staff, colleagues and I spent the next two years validating, refining, analyzing, reassembling and annotating these data before publication of the first public release in 2012 (Wang et al.) Our approach of a purely de novo assembly from short (Illumina) shotgun reads was controversial when the project was initiated, and was predicted by most service providers to fail and produce millions of fragments that were too small to assemble or annotate. However, based on my laboratory's experience with the flax genome, and BGI's success with this approach in vertebrates, I made a carefully considered decision to pursue this novel strategy. This approach was ultimately very successful, and allowed us to deliver an assembly that contained essentially the complete gene space of flax (e.g. 81% genome coverage, 96% coverage of ESTs, N50 scaffold = 694 kb). Along with the unrelated date palm project, this was the first demonstration of this highly efficient approach to genome sequencing in plants, and is now being used widely in plant genomics. The information in the genome assembly is being widely used (4,396 unique page views at phytozome.org, and 602 assembly downloads). Following our publication of the genome assembly, my laboratory has continued to investigate and characterize other aspects of the genome, including transposable elements, and large gene families important to cell wall biosynthesis including beta-galactosidases, pectin methylesterases, chitinases, and arabinogalactan proteins.

Using this information, my laboratory identified the first genetically defined component specific to gelatinous-type cell wall biosynthesis. Certain types of thick cell walls are particularly strong and are rich in a crystalline form of cellulose. These are gelatinous (G-type) walls, which are found in the outer stem (i.e. bast) of flax and many other species, and in the reaction (e.g. tension) wood produced by trees whenever extra support is required. The development of G-type walls is therefore industrially important because it affects the properties of wood and fibers, and is also scientifically interesting as a contrast to the better known modes of cell wall biosynthesis that occur in other plant cell types. Based on observations my laboratory made using the first flax microarray (also produced in my lab) we identified beta-galactosidases as potentially critical enzymes in the development of G-type walls. We demonstrated this importance through a series of experiments that culminated in the first published use of reverse genetics through RNA-silencing in flax, and provided the first experimental evidence for a requirement for galactan metabolism (through beta-galactosidases) in flax. Our hypothesis, which was supported by the previous characterization of the galactan substrate by our Russian collaborator, Tatyana Gorshkova, was that activity of beta-galactosidases on a wall-specific galactan polymer at a critical stage of cellulose deposition was necessary for the cellulose crystallization that typified these types of fibers. This was the first functional genetic demonstration of a mechanism specific to these interesting and important types of cell walls.



Campion Marine Inc.

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Tel. (250) 765-7795

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www.campionboats.com

October 5, 2016

Subject: Support letter for establishment of the Materials and Manufacturing Research Institute (MMRI)

Dear Drs. DiLabio & Milani,

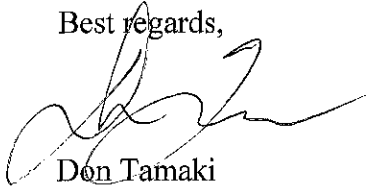
Campion Marine is one of the largest boat manufacturers in North America. We are also the last remaining composite boat manufacturer in Canada. Our product line includes more than 37 models and 48 variations of boats including high-tech, high-performance, luxury, sport utility, express cruisers, runabouts, stern drives, outboards, sport cabin, bow rider, closed deck, wake and surf boats.

As a market leader in the field, we continually endeavour towards enhancing our R&D activities, to both provide greater efficiencies in our processes and an ever-superior product for our consumers. As part of these activities and experience, we well recognize the need for knowledge-based, advanced materials and manufacturing practices to arrive at cost-effective and optimum practical solutions. Aligned with this vision, we commend and welcome the initiative taken by UBC's Okanagan campus to establish an institute for materials and manufacturing research and development. We envision that the collective expertise that this institute will bring from a large number of pure and applied science departments of UBC will be one of the first in its kind and can assist leading companies in the region, Canada, and beyond to remain competitive. This opportunity will be further enhanced by benefiting from cutting edge collaborative university-industry research projects and accessing the state-of-the-art research facilities a UBC, along with world-class students who will be tomorrow's employees and leaders in industry and academia.

Our anticipated contribution in the primary stages of establishment of this institute will include direct advice on defining strategic project topics that can be of interest to our industry sector as a whole. In the longer run, once new collaborative projects are established, we anticipate an active participation of our R&D staff in different phases of research with faculty, donating test materials, assisting in training students in complex science and engineering problems, along with collaboration with other industrial sectors for bigger initiatives nationally and internationally.

Campion strongly supports this initiative and is looking forward to new collaborative project opportunities, specially in the emerging areas such bioresin and biocomposites research for green manufacturing of marine products.

Best regards,

A handwritten signature in black ink, appearing to read 'Don Tamaki', written over the printed name.

Don Tamaki
Production Manager

UBC Vancouver members (list in progress):

Name	Faculty/Department	Projected Division of MMRI	Top Three Areas of Expertise
Chen Greif	Department of Computer Science	ATMM	Scientific computing; Preconditioning techniques
Tamara Munzner	Department of Computer Science	ATMM	Development, evaluation, and characterization of information visualization systems
N. Dorin Ruse	Faculty of Dentistry	BBMM	Biomaterials; Surface Characterization; Fatigue/fracture mechanics;
Edward E. Putnins	Faculty of Dentistry	BBMM	Periodontal Regeneration; Bone Marrow Stem Cells
Ricardo Carvalho	Faculty of Dentistry	BBMM	Biomaterials; Dental ergonomics
Rick White	Department of Statistics	PNMM	Bioinformatics; Biostatistics; Experimental Design
James V Zidek	Department of Statistics	ATMM	Bayesian decision analysis, Monitoring network design, Spatial prediction
Nancy Heckman	Department of Statistics	BCMM	Functional data analysis and applications; Nonparametric regression
Donald E. Brooks	Pathology and Chemistry	PNMM	Grafted polymer chains; Interaction of blood and biological fluids; Biocompatible surface identification
York N. Hsiang	VGH, Division of Vascular Surgery	ENMM	Photodynamic therapy; Arterial restenosis; Arterial remodelling & Endovascular surgery research
Ben Chew	Department of Urologic Sciences	BBMM	Biomaterials, Urinary devices, New coatings and special drug-eluting materials for urinary catheters and stents
Sam M. Wiseman	Department of Surgery, St. Paul's Hospital	BBMM	Thyroid surgery; Parathyroid surgery; Surgical oncology; General surgery
Alice Mui	Department of Surgery & Department of Biochemistry and Molecular Biology	BBMM	Human inflammatory disorders and hematological malignancies
Shahriar Mirabbasi	Department of Electrical and Computer Engineering	ENMM	Sensor Interface Circuits for Harsh Environments (High Temperature and Pressure)
Sathish Gopalakrishnan	Department of Electrical and Computer Engineering	ENMM	Real-time systems; Distributed systems, Resource management
Frank Ko	Department of Materials Engineering	BBMM	Textile Structures; Biomedical Appellations
Cristina Zanotti	Department of Civil Engineering	BCMM	Sustainable construction technologies; Fracture Mechanics; Repair of historical heritage and modern structures

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Dean's Office
Faculty of Health & Social Development
ART 361, 3333 University Way
Kelowna, BC V1V 1V7
P#: 250.807.9902 F#: 250.807.9865

May 09, 2017

Dear Dr. Sadiq:

The Faculty of Health and Social Development (FHSD) strongly supports the School of Engineering's proposal for establishing the Materials and Manufacturing Research Institute (MMRI). As a research organization the MMRI has the potential for making major industrial and medical discoveries that can significantly improve the lives and well-being of countless numbers of people worldwide. The five identified pillars supporting the proposed institute represent vital areas of research that offer hope of modernizing transportation, medical diagnoses and treatments, and basic material production. Advances in these areas are important for Canada and developing nations.

While the Faculty of Health and Social Development endorses and supports the entire MMRI concept, we are particularly pleased that the program design includes a biomedical and biological materials and manufacturing section. Our Schools of Nursing and Health Exercise Sciences are well positioned to collaborate in the design, testing, and evaluation of medical diagnostic and treatment materials. Furthermore, our School of Social Work is a regional leader in the assessment and treatment of mental disorders. Researchers from each of these Schools are capable of evaluating how biomedical instruments and materials psychologically impact patients across economic, ethnic and racial groupings.

The ability of the MMRI to bring together researchers with diverse backgrounds is a major step forward for the University, community, and nation. Moreover, having a single institute invested in both basic scientific discovery and applied science provides opportunity for our students and faculty.

The FHSD endorses the proposed MMRI and looks forward to partnering and collaborating with the new institute and industrial participants.

Sincerely,

Edward H. Taylor, Ph.D.
Associate Dean

From: Eggleston, Robert
Sent: Tuesday, May 09, 2017 3:38 PM
To: Oldford, Stephanie <oldfords@mail.ubc.ca>
Subject: RE: Consultation requested on Proposal for new Materials and Manufacturing Research Institute in the School of Engineering

Hi Stephanie:

I have looked through the MMRI proposal, and although I cannot claim to be well versed in all of its finer details, I do support the proposal and wish its proponents success as they move it through the Senate approval process.

Regards,

Robert

Robert Eggleston, PhD
Dean *pro tem* | Faculty of Creative and Critical Studies
CCS 323C | Creative and Critical Studies Building
The University of British Columbia | Okanagan Campus
1148 Research Rd | Kelowna, BC | Canada V1V 1V7
Phone 250 807 9380 | Email: robert.eggleston@ubc.ca

Hi Stephanie:

Based on the response from Mike below, please, accept this as official support for the MMRI from the Barber School.

Best regards,

Wisdom

Wisdom J. Tettey, PhD, FGA
Professor and Dean
Irving K. Barber School of Arts and Sciences
Arts and Sciences Centre Room ASC 406
University of British Columbia
Okanagan Campus
3187 University Way
Kelowna, British Columbia
Canada
V1V 1V7
Phone: 250-807-9527
Fax: 250-807-800

From: Mike Evans <michael.evans@ubc.ca>

Date: Tuesday, May 9, 2017 at 1:01 PM

To: "Oldford, Stephanie" <oldfords@mail.ubc.ca>

Cc: Wisdom Tetley <wisdom.tetley@ubc.ca>, "Martin, Julie" <julie.martin@ubc.ca>, Unit Heads - Barber School <ubcokbd-ml-bsasunithead@mail.ubc.ca>, "Carlaw, Kenneth" <Kenneth.Carlaw@ubc.ca>, "DiLabio, Gino" <gino.dilabio@ubc.ca>, "Frohlick, Susan" <frohlick@mail.ubc.ca>, "Ghosh, Sanjoy" <sanjoy.ghosh@ubc.ca>, "Higgs, Catherine" <catherine.higgs@ubc.ca>, "Hornibrook, Edward" <ed.hornibrook@ubc.ca>, "Lawrence, Ramon" <ramon.lawrence@ubc.ca>, "Libben, Maya" <maya.libben@ubc.ca>

Subject: MMR Institute

Dear Stephanie,

Embedded here are specific comments received in response to an email I sent out to the Heads of Departments and the Research Planning and Infrastructure Development Committee of the BSAS soliciting feedback. Unfortunately timelines did not allow for committee style consideration of the document, and the responses are thus fragmented. Aside from the few queries below, the general tenor of feedback I have is positive, and in the vein of a collegial hope that this Institute will move the research programs of colleagues in Applied Sciences, and those with whom they collaborate, forward.

Best
Mike

Specific comments:

The proposed lead (pg 16 of 150), Dr. Phillion has just joined McMaster in 2016 and is only associated with this proposal as 'acting'. He was at the School of Engineering from 2010-2016. Given the physical distance between Hamilton and Kelowna and his new responsibilities at his new University, we probably would need a new lead to move this element forward.

Why is there a need for one big proposal rather than 4 separate ones. The application areas are quite distinct and I do not see why they should be clustered together.

I wonder about the number of core vs. associate UBCO members in the BBMM division. Specifically, there are only 3 core UBCO members (two being co-leads) with 9 associate UBCO members in the BBMM division. By contrast, the ATMM, BCMM and ENMM have between 5-9 core members with a maximum of 2 associate members. Based on the membership definitions provided on page 4 of the document, I wonder whether this has the potential to impact research productivity in the BBMM division.

From: Crichton, Susan

Sent: Monday, May 08, 2017 3:25 PM

To: Oldford, Stephanie <oldfords@mail.ubc.ca>

Subject: Re: Consultation requested on Proposal for new Materials and Manufacturing Research Institute in the School of Engineering

I've reviewed the proposal for the new Materials and Manufacturing Research Institute in the School of Engineering and support it going forward.

S

Susan Crichton
Associate Dean, Faculty of Education
Director Innovative Learning Centre
University of British Columbia
3139 EME Building
3333 University Way
Kelowna BC V1V 1V7
(250) 807-8638
Susan.crichton@ubc.ca
SKYPE SusanCrichton

From: Berringer, Heather
Sent: Monday, May 08, 2017 11:56 AM
To: Oldford, Stephanie <oldfords@mail.ubc.ca>
Subject: Re: Consultation requested on Proposal for new Materials and Manufacturing Research Institute in the School of Engineering

Dear Stephanie:

I have reviewed the proposal and consulted with relevant subject librarians, and see nothing therein that would cause concern from the Library's perspective.

The Library is sufficiently resourced to support current research and teaching in the areas of materials and manufacturing. The primary gap in our collections relative to some other institutions that work in the area(s) under consideration is Elsevier's Scopus database, to which UBC does not subscribe. We have frequent requests for access to this product, but it is cost-prohibitive and I do not expect the situation to change in the near future.

There are other (primarily electronic) resources that would enhance the work of this Institute and to which we do not currently have access, but they are more "nice-to-have" than necessary. I would be pleased to provide a list if it would be of interest. The bottom line, however, is that we certainly provide access to the foundational resources required and I am absolutely supportive of the proposal.

All the best,
Heather

Heather Berringer MLIS
Chief Librarian
The University of British Columbia | Okanagan Campus
3287 University Way | Kelowna BC | V1V 1V7
Phone 250 807 9142
heather.berringer@ubc.ca | [@UBCOLibrary](#)
<http://library.ok.ubc.ca>

From: Sugden, Roger
Sent: Sunday, May 07, 2017 5:01 PM

To: Oldford, Stephanie <oldfords@mail.ubc.ca>

Cc: Sadiq, Rehan <Rehan.Sadiq@ubc.ca>; Chiasson, Mike (MGMT) <mike.chiasson@ubc.ca>

Subject: Re: Consultation requested on Proposal for new Materials and Manufacturing Research Institute in the School of Engineering

Stephanie, hi

The School of Engineering has been liaising closely with the Faculty of Management over the establishment of a Materials and Manufacturing Research Institute (MMRI) on the Okanagan Campus. Management is very supportive of this initiative, which we see as an important step in developing the campus's research activities.

Best

Roger

Roger Sugden, PhD
Dean | Faculty of Management
The University of British Columbia | Okanagan Campus
EME 4145 1137 Alumni Ave | Kelowna, BC V1V 1V7
Phone 1 250 807 9946



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8 May 2017

To: Okanagan Senate

From: Admissions and Awards Committee

Re: Admissions Proposals

- a) Classification of Students - Academic Calendar entry update (approval)
- b) Master of Social Work- Changes in Admission Requirements (approval)

**a) Classification of Students - Academic Calendar entry update
(approval)(circulated)**

The Committee has reviewed and recommends to Senate for approval the updating of the Classification of Students list in the Admissions chapter of the Calendar.

While no substantive revision is necessary, updating the Classification of Students Calendar listing is required for clarity. Two changes are proposed. First, the classification of 'Qualifying Student', already a classification listed under the College of Graduate Studies' Classification of Students in the Calendar, should be duplicated in the Classification of Students Calendar page in the general Admissions chapter. Although 'Qualifying Student' is a classification reserved for graduate-level studies, duplication of the classification in the general Admissions Calendar chapter provides consistency with the Vancouver Calendar as well as providing transparency for fees and other operational matters.

The second change proposed is the deletion of the "classification" of 'Auditor', which is not a classification but a matter of course assessment and completion. 'Audit' is already correctly identified in the Standings Calendar page. This change is being replicated in the Vancouver Calendar.

Motion: *That Senate approve the deletion of 'Auditor' and addition of 'Qualifying Student' to Classification of Students in the Admissions chapter of the Calendar, effective for admission to the 2017 Summer Session and thereafter.*

**b) Master of Social Work- Changes in Admission Requirements
(approval)(circulated)**

The Committee has reviewed and recommends to Senate for approval changes in admission requirements for applicants to the Master of Social Work program.

The Master of Social Work program proposes several revisions to admission requirements; the revisions are applicable to both the Advanced One-Year Track and the Foundational Two-Year Track.

While a resume is a new admission requirement, most of the revisions are editorial changes to provide clarity to applicants. Currently a criminal record check is required prior to the start of classes as noted on the Master of Social Work General Requirements Calendar page; however, indicating the criminal record check under Admission Requirements allows applicants more transparency upfront. Submission of the criminal record check is not required as part of the application package but is necessary before entering the program.

Additionally, the language proficiency test scores have been raised slightly higher than the College of Graduate Studies' minimums as the Social Work program includes practica serving vulnerable clients.

Motion: *That Senate approve changes to admission requirements for applicants to the Master of Social Work program, effective for admission to the 2018 Summer Session.*

Respectfully submitted,

Dr. Marianne Legault
Chair, Admissions and Awards Committee



Admissions Proposal Form Okanagan Campus

Faculty/School: Enrolment Services Dept./Unit: Faculty/School Approval Date: Effective Session: 2017S	Date: March 27, 2017 Contact Person: Maggie O'Neill Phone: 250.807.9619 Email: Maggie.oneill@ubc.ca
Type of Action: Update the Classification of Students Calendar page in the Admissions chapter	
Rationale: <ol style="list-style-type: none"> 1. Currently, the College of Graduate Studies has a similar “Classification of Students” Calendar listing that includes: Master’s Student, Doctoral Student, Qualifying Student, Visiting Graduate Student, and On-leave Status. http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,999,0 In Vancouver, ‘Qualifying Student’ is listed in the “Classification of Students” page in the Admissions chapter. To increase transparency, it is recommended to mirror Vancouver and add “Qualifying Student” to the Okanagan’s “Classification of Students” Admissions chapter. 2. Auditor ‘classification’ is technically not a classification of student and therefore should be deleted from the Classification of Student section. Audit is correctly identified and explained in the Standings Calendar page, describing expectations of course assessment completion: http://www.calendar.ubc.ca/okanagan/?tree=3,41,90,1015 <p>Audit (AUD) is granted to students who have been officially approved as having audit status. These students are expected to complete all course requirements except the final exam, and may be given Fail (F) standing if their performance is not satisfactory. See <u>Classification of Students</u>.</p>	



Proposed Academic Calendar Entry:

[174]

1. **Access Studies.** Applicants may be enrolled as Access Studies students upon approval by a faculty (a) to allow them to take a limited number of courses in a specific area to upgrade or achieve a qualification, or (b) when they do not wish to pursue a specific program. Distance Education students may be enrolled in this category. Students in this category may normally take up to 6 credits per academic term, up to a maximum of 24 credits in total while registered as Access Studies students. Students enrolled in a UBC degree program may not normally be concurrently registered as Access Studies students. Although documentation requirements vary by faculty, Access Studies applicants are not normally required to submit transcripts or other academic documentation of prior study. Students with English as a second language, however, are required to satisfy the English Language Admission Standard in the same way as applicants to degree programs. Students who have been required to withdraw from any post-secondary institution must provide official

Draft Academic Calendar URL:

Homepage (draft) Admissions Classification of Students

<http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=2,32,0,0>

Present Academic Calendar Entry:

[174]

1. **Access Studies.** Applicants may be enrolled as Access Studies students upon approval by a faculty (a) to allow them to take a limited number of courses in a specific area to upgrade or achieve a qualification, or (b) when they do not wish to pursue a specific program. Distance Education students may be enrolled in this category. Students in this category may normally take up to 6 credits per academic term, up to a maximum of 24 credits in total while registered as Access Studies students. Students enrolled in a UBC degree program may not normally be concurrently registered as Access Studies students. Although documentation requirements vary by faculty, Access Studies applicants are not normally required to submit transcripts or other academic documentation of prior study. Students with English as a second language, however, are required to satisfy the English Language Admission Standard in the same way as applicants to degree programs. Students who have been required to withdraw from any post-secondary institution must provide official transcripts. To be welcomed as an Access



transcripts. To be welcomed as an Access Studies student, one must normally first complete a minimum of 15 credits of transferable coursework with a GPA of 2.0 on the 4.0-point scale since having been required to withdraw. Students who have been required to withdraw more than once from any post-secondary institution or program are not eligible for admission as Access Studies students. Continuation as an Access Studies student is normally contingent upon maintaining a passing grade on all courses attempted. Admission as an Access Studies student does not guarantee that a student will be able to register for any course offered. Admission as an Access Studies student does not imply future admission as a regular student. For further information about Access Studies, please contact Enrolment Services at nondegree.ok@ubc.ca.

Studies student, one must normally first complete a minimum of 15 credits of transferable coursework with a GPA of 2.0 on the 4.0-point scale since having been required to withdraw. Students who have been required to withdraw more than once from any post-secondary institution or program are not eligible for admission as Access Studies students. Continuation as an Access Studies student is normally contingent upon maintaining a passing grade on all courses attempted. Admission as an Access Studies student does not guarantee that a student will be able to register for any course offered. Admission as an Access Studies student does not imply future admission as a regular student. For further information about Access Studies, please contact Enrolment Services at nondegree.ok@ubc.ca.

~~2. Auditor. A student registered in a credit course whose participation is limited to that deemed appropriate by the instructor but who, in general, is expected to maintain the same schedule of readings as regular students but is not expected to write examinations. An auditor may not transfer to the category of regular student during the term, nor may a regular student transfer to the category of auditor except upon the recommendation of the dean of the faculty or the director of the school concerned. Application for admission as an auditor must parallel the procedures~~



<p>2. Exchange. A visiting student studying at UBC under a Senate-approved student exchange program and enrolled in studies for transfer to a degree program at another university.</p> <p>3. Mature Student. An individual whose formal education was interrupted and who did not meet the normal requirements for admission but who demonstrated an intellectual maturity that permitted acceptance to the University. Mature students are permitted to undertake degree or diploma studies on the same basis as a</p>	<p>for the application of regular students. The application for admission must be accompanied by a written explanation of the reason that status as an auditor is sought. Once formal application has been made, the decision on acceptance, or otherwise, will be made by the dean of the faculty or the director of the school concerned or the dean's or director's designate. The fees for auditors will be the same as those for regular undergraduate students (see <u>Fees</u>). There will be a statement of "audit" on the permanent academic record for any course taken by a student as an auditor. Students taking a combination of credit and audit courses will be subject to restrictions on maximum workload imposed by the faculties as interpreted by faculty advisors.</p> <p>3. Exchange. A visiting student studying at UBC under a Senate-approved student exchange program and enrolled in studies for transfer to a degree program at another university.</p> <p>4. Mature Student. An individual whose formal education was interrupted and who did not meet the normal requirements for admission but who demonstrated an intellectual maturity that permitted acceptance to the University. Mature students are permitted to undertake degree or diploma studies on the same basis as a</p>
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regular student. Admission criteria are outlined under Mature Applicants.

4. Qualifying

A student whose academic background entitles him or her to serious consideration for admission to graduate studies but who is considered to be inadequately prepared to enter a graduate program in the specific discipline (e.g., three-year degree holders from other Canadian universities, a student changing from one field of study to another, or a student upgrading his or her academic standing) may be admitted as a qualifying student. Qualifying students are not considered graduate students.

If, at the end of a qualifying term or year, the graduate program and the College of Graduate Studies are satisfied with the calibre of the student's work, the student may apply for admission to a graduate degree program.

Courses taken during a qualifying year or term that are necessary in order to meet the requirements for full admission to Graduate Studies cannot be transferred to a subsequent graduate program. However, other courses may be transferred upon the recommendation of the department and with the approval of the Dean of the College of Graduate Studies.

Qualifying student status is available only to applicants who do not require a study permit to enter Canada.

regular student. Admission criteria are outlined under Mature Applicants.



<p>5. Regular. A student enrolled for studies leading to a degree or diploma, whether on a full- or a part-time basis.</p> <p>6. Unclassified. A student enrolled for studies not intended to lead to a particular degree or diploma. Unclassified students should normally have a recognized degree. Admission as an unclassified student does not guarantee that a student will be able to register for any course offered. Admission as an unclassified student does not imply future admission as a regular student. Students with a failed year in a faculty will not be admitted as unclassified until they have discontinued their studies for at least one year. After a second failed year, admission as unclassified will be subject to the approval of the Senate Admissions & Awards Committee.</p> <p>a. <i>Unclassified Students Applying to Second or Subsequent Undergraduate Degree Programs</i> A faculty may limit the number of credits taken as an unclassified student that may be counted for credit toward a second or subsequent undergraduate degree. See individual faculty listings and/or contact faculty advisors for details.</p> <p>b. <i>Unclassified Students Applying to Graduate Programs</i></p>	<p>5. Regular. A student enrolled for studies leading to a degree or diploma, whether on a full- or a part-time basis.</p> <p>6. Unclassified. A student enrolled for studies not intended to lead to a particular degree or diploma. Unclassified students should normally have a recognized degree. Admission as an unclassified student does not guarantee that a student will be able to register for any course offered. Admission as an unclassified student does not imply future admission as a regular student. Students with a failed year in a faculty will not be admitted as unclassified until they have discontinued their studies for at least one year. After a second failed year, admission as unclassified will be subject to the approval of the Senate Admissions & Awards Committee.</p> <p>a. <i>Unclassified Students Applying to Second or Subsequent Undergraduate Degree Programs</i> A faculty may limit the number of credits taken as an unclassified student that may be counted for credit toward a second or subsequent undergraduate degree. See individual faculty listings and/or contact faculty advisors for details.</p> <p>b. <i>Unclassified Students Applying to Graduate Programs</i></p>
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<p>Courses taken as an unclassified (or non-degree) student may be approved for transfer toward a graduate program on permission of the department and the Dean of the College of Graduate Studies.</p> <p>Consistent with standard transfer credit regulations, students are limited to transferring a maximum of 12 credits or up to 40% of the program credit requirements, whichever is more, toward their master's program. No more than 6 credits of transfer credit may be at the undergraduate level (300-400). To be eligible for transfer, a minimum B standing must have been achieved and the course(s) must not have been counted toward the completion of another degree or program.</p> <p>7. Visitor. A student enrolled in studies at the UBC Okanagan campus for transfer back to their current home post-secondary institution which is recognized by UBC. Students must be in good standing at their home institution and must submit an official transcript and a Letter of Permission with their application. Course registrations will be made on a space-available basis only. A Letter of Permission is valid for one session only. A Letter of Permission must be submitted for any subsequent sessions in</p>	<p>Courses taken as an unclassified (or non-degree) student may be approved for transfer toward a graduate program on permission of the department and the Dean of the College of Graduate Studies.</p> <p>Consistent with standard transfer credit regulations, students are limited to transferring a maximum of 12 credits or up to 40% of the program credit requirements, whichever is more, toward their master's program. No more than 6 credits of transfer credit may be at the undergraduate level (300-400). To be eligible for transfer, a minimum B standing must have been achieved and the course(s) must not have been counted toward the completion of another degree or program.</p> <p>7. Visitor. A student enrolled in studies at the UBC Okanagan campus for transfer back to their current home post-secondary institution which is recognized by UBC. Students must be in good standing at their home institution and must submit an official transcript and a Letter of Permission with their application. Course registrations will be made on a space-available basis only. A Letter of Permission is valid for one session only. A Letter of Permission must be submitted for any subsequent sessions in</p>
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<p>which a student wishes to register for courses. For applicable fees, see Fees.</p> <p>8. Visiting International Research</p> <p>Student An international student who is enrolled in an undergraduate, graduate, or graduate-equivalent program at another university, or is a participant in a UBC-recognized (through Go Global) “bridging” program between undergraduate and graduate studies, who visits UBC for one month or longer to conduct research only.</p> <p>A Visiting International Research Student must be supervised by a UBC faculty member throughout the visit, and must have the written permission of their home institution or sponsoring program to visit UBC to conduct research. The Head for the unit or laboratory with which the visitor will be affiliated has final authority to approve a Visiting International Research Student visit. Students whose home institution has a formal academic student exchange agreement with UBC will be registered as exchange students unless reciprocity quotas are filled; in which case additional students may come under the Visiting International Research Student designation.</p> <p>A Visiting International Research Student will normally come to UBC for a maximum of one year. At the end of the approved visit period, the student may request an</p>	<p>which a student wishes to register for courses. For applicable fees, see Fees.</p> <p>8. Visiting International Research</p> <p>Student An international student who is enrolled in an undergraduate, graduate, or graduate-equivalent program at another university, or is a participant in a UBC-recognized (through Go Global) “bridging” program between undergraduate and graduate studies, who visits UBC for one month or longer to conduct research only.</p> <p>A Visiting International Research Student must be supervised by a UBC faculty member throughout the visit, and must have the written permission of their home institution or sponsoring program to visit UBC to conduct research. The Head for the unit or laboratory with which the visitor will be affiliated has final authority to approve a Visiting International Research Student visit. Students whose home institution has a formal academic student exchange agreement with UBC will be registered as exchange students unless reciprocity quotas are filled; in which case additional students may come under the Visiting International Research Student designation.</p> <p>A Visiting International Research Student will normally come to UBC for a maximum of one year. At the end of the approved visit period, the student may request an</p>
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extension for up to one year. A visit lasting more than one year will require renewal of their permissions, registration, and fees.

See also [Visiting Graduate Student](#).

extension for up to one year. A visit lasting more than one year will require renewal of their permissions, registration, and fees.

See also [Visiting Graduate Student](#).



Admissions Proposal Form Okanagan Campus

Faculty/School: Health & Social Development Dept./Unit: School of Social Work Faculty/School Approval Date: March, 2017 Effective Session: 2018 Summer	Date: January 11, 2017 Contact Person: Dr. John Graham Phone: 250.807.9980 Email: john.graham@ubc.ca
Type of Action: Revise Admissions requirements – Program level	
Rationale: <ol style="list-style-type: none"> 1) International programs may refer to the equivalent of a Bachelor of Social Work degree by various other names e.g. Bachelor of Science in Social Work degree. Thus, the School proposes to clarify for international students that, whether or not their degree was called a Bachelor of Social Work degree, they are eligible to apply for the Advanced One-Year Track if their degree is deemed at least equivalent to a UBC Bachelor of Social Work degree AND if their program is deemed equivalent to a Canadian Bachelor or Masters of Social Work by the Canadian Association of Social Workers or the Council of Social Work Education. 2) We wish to reflect the College of Graduate Studies' minimum grade average requirement in our admission requirements. 3) We propose to update the language proficiency requirement to the Internet-based TOEFL instead of requiring a paper-based TOEFL, which is now rarely used. 4) Given that ours is a professional program which includes practica serving vulnerable clients, we propose to raise our minimum required language proficiency. 5) We wish to require a Statement of Purpose rather than an academic study plan, as this provides greater relevance and more meaningful information for admission evaluation since most students enter the course-based option of the M.S.W program. 6) To aid in student recruitment, we propose to clarify that any course on the applicable approved course list on our website meets the admission requirement. 7) The government of British Columbia requires any student who will be interacting with children or other vulnerable persons to complete a criminal record check before starting a practicum. The School proposes to address this at the admission stage rather than at any later point in an admitted student's program. 8) To enhance our assessments of the scope and extent of applicants' social-work-related experience, we wish to require submission of a resume or curriculum vitae. 	



Proposed Academic Calendar Entry:

Master of Social Work – Advanced One-Year Track

Admission Requirements

The M.S.W. program is governed by the policies of the College of Graduate Studies and the School of Social Work. Students applying to the Advanced One-Year Track of the program **must** hold a **Bachelor of Social Work** degree from an accredited **Canadian** social work program **(or the international equivalent from a program recognized by the Canadian Association of Social Workers or the Council of Social Work Education)**. **Applicants must have:**

- **In 300-level courses and above, a minimum overall grade average equivalent to a UBC B+ (76-79%) or higher;**
- completed an **approved** course in statistics **(see list of approved courses on the School of Social Work website);**
- completed a **Statement of Purpose**;
- **submitted a resume or curriculum vitae;**
- post-**degree** social work experience;
- provided three letters of reference; **and**
- **immediately upon acceptance of an admission offer, submitted an acceptable criminal record check for relevant and specified offenses as defined under the Criminal Records Review Act of British Columbia (see the School of Social Work website**

Draft Academic Calendar URL:

<http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,985,1177>

Present Academic Calendar Entry:

Master of Social Work – Advanced One-Year Track

[16007] Admission Requirements

[13561] The M.S.W. program is governed by the policies of the College of Graduate Studies and the School of Social Work. Students applying to the Advanced One-Year Track ~~will~~ hold a B.S.W. degree from an accredited social work program ~~and have:~~

[13832]

- a minimum grade average of B+ (76-79%) ~~in the third- and fourth-year levels of their B.S.W. program;~~
- ~~a minimum score of 600 on the TOEFL, for students whose undergraduate degree was not completed in English;~~
- completed a ~~3-credit~~ course in statistics;
- post-~~B.S.W.~~ social work experience;
- completed a **proposed academic study plan;** ~~and~~
- provided three letters of reference.

[13694] Admission procedures can be found at College of Graduate Studies.



regarding the criminal record check submission process);

If applicable, applicants from a university at which English is not the primary language of instruction must present evidence of competency to pursue studies in the English language prior to being extended an offer of admission. The Master of Social Work program is a professional program which requires language proficiency test scores that are beyond the College of Graduate Studies' required minimum overall scores. Acceptable English language proficiency tests, and minimum test scores, for applicants to the Master of Social Work program are:

- a minimum overall score of 100 on the Internet-based TOEFL (iBT) with no individual section score lower than 22, beyond the College of Graduate Studies required minimum overall score of 90; or
- a minimum overall score of 7 on the ACADEMIC IELTS with no individual section score lower than 6.5, beyond the College of Graduate Studies required minimum overall score of 6.5; or
- a minimum final score of 90 with a minimum of 3+ in the speaking test on MELAB, beyond the College of Graduate Studies required minimum overall score of 85.

The College of Graduate Studies administers the entire application process and applications are forwarded to the School of Social Work once they are complete. Admission procedures can



be found on the [College of Graduate Studies website](#).

Applicants are encouraged to review the Frequently-Asked-Questions (FAQs) on the School of Social Work and the College of Graduate Studies websites.
School of Social Work FAQs.
College of Graduate Studies Application FAQs.



Admissions Proposal Form Okanagan Campus

Faculty/School: Health & Social Development Dept./Unit: School of Social Work Faculty/School Approval Date: January 24, 2017 Effective Session: 2018 Summer	Date: January 11, 2017 Contact Person: Dr. John Graham Phone: 250.807.9980 Email: john.graham@ubc.ca
Type of Action: Revise Admissions requirements – Program level	
Rationale: <ol style="list-style-type: none"> 1) We wish to reflect the College of Graduate Studies' minimum grade average requirement in our admission requirements. 2) We propose to update the language proficiency requirement to the Internet-based TOEFL instead of requiring a paper-based TOEFL, which is now rarely used. We propose to identify that our language proficiency requirement is beyond that required by the College of Graduate Studies. 3) Given that ours is a professional program which includes practica serving vulnerable clients, we propose to raise our minimum required language proficiency. 4) We wish to require a Statement of Purpose rather than an academic study plan, as this provides greater relevance and more meaningful information for admission evaluation since most students enter the course-based option of the M.S.W program. 5) To aid in student recruitment, we propose to clarify that any course on the applicable approved course list on our website meets the M.S.W. admission requirement. 6) The government of British Columbia requires any student who will be interacting with children or other vulnerable persons to complete a criminal record check before starting a practicum. The School proposes to address this at the admission stage rather than at any later point in an admitted student's program. 7) To enhance our assessments of the scope and extent of applicants' social-work-related experience, we wish to require submission of a resume or curriculum vitae. 	

**Proposed Academic Calendar Entry:**

Master of Social Work – Foundational
Two-Year Track
Admission Requirements

The M.S.W. program is governed by the policies of the College of Graduate Studies and the School of Social Work. Students applying to the Foundational Two-Year Track will hold **an undergraduate** degree with preference given to social science and behavioural science courses and have:

- **In 300-level courses and above, a minimum overall grade average equivalent to a UBC B+ (76-79%) or higher;**
- completed an **approved** course in statistics (**see list of approved courses on the School of Social Work website**);
- completed an **approved** course in research methods (**see list of approved courses on the School of Social Work website**);
- completed a **Statement of Purpose**;
- **submitted a resume or curriculum vitae;**
- provided three letters of reference; **and**
- **immediately upon acceptance of an admission offer, submitted an acceptable criminal record check for relevant and specified offenses as defined under the Criminal Records Review Act of British Columbia (see the School of Social Work website regarding the criminal record check submission process).**

Draft Academic Calendar URL:

<http://www.calendar.ubc.ca/okanagan/proof/edit/index.cfm?tree=18,285,985,1291>

Present Academic Calendar Entry:

Master of Social Work – Foundational
Two-Year Track
[15990] Admission Requirements

[15991] The M.S.W. program is governed by the policies of the College of Graduate Studies and the School of Social Work. Students applying to the **M.S.W.** Foundational Two-Year Track will hold **a bachelor's** degree with preference given to social science and behavioural science courses and have:

[15992]

- a minimum grade average of B+ (76-79%) in the third- and fourth-year levels of their undergraduate degree program;
- **a minimum score of 600 on the TOEFL, for students whose undergraduate degree was not completed in English;**
- completed a **3-credit** course in statistics;
- completed **a 3-credit** course in research methods;
- completed a **proposed academic study plan**; and
- provided three letters of reference.



Preference will be given to applicants who meet the above criteria and have **employment** or volunteer social work- **related** experience.

If applicable, applicants from a university at which English is not the primary language of instruction must present evidence of competency to pursue studies in the English language prior to being extended an offer of admission. The Master of Social Work program is a professional program which requires language proficiency test scores that are beyond the College of Graduate Studies' required minimum overall scores. Acceptable English language proficiency tests, and minimum test scores, for applicants to the Master of Social Work program are:

- **a minimum overall score of 100 on the Internet-based TOEFL (iBT) with no individual section score lower than 22, beyond the College of Graduate Studies required minimum overall score of 90; or**
- **a minimum overall score of 7 on the ACADEMIC IELTS with no individual section score lower than 6.5, beyond the College of Graduate Studies required minimum overall score of 6.5; or**
- **a minimum final score of 90 with a minimum of 3+ in the speaking test on MELAB, beyond the College of Graduate Studies required minimum overall score of 85.**

The College of Graduate Studies administers the entire application

[15993] Preference will be given to applicants who meet the above criteria and have **related** ~~paid~~ or volunteer social work experience.

[15994] Admission procedures can be found at College of Graduate Studies.



process and applications are forwarded to the School of Social Work once they are complete. Admission procedures can be found on the [College of Graduate Studies website.](#)

Applicants are encouraged to review the Frequently-Asked-Questions (FAQs) on the School of Social Work and the College of Graduate Studies websites.
[School of Social Work FAQs.](#)
[College of Graduate Studies Application FAQs.](#)



24 April 2017

To: Okanagan Senate

From: Senate Admissions and Awards Committee

Re: International Undergraduate Student Admission – Reconsideration of the May 1996 Senate Resolution

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- Motion 1:** *That Senate receive the report on “International Undergraduate Student Admission – Reconsideration of the May 1996 Senate Resolution”;*
- Motion 2:** *That the May 1996 Admission Policy for International Students be rescinded;*
- Motion 3:** *That the revised Principles of Effective Undergraduate Admission to UBC be approved;*
- Motion 4:** *a. That international students not displace Canadian citizens and permanent residents for admission to the University;*
- b. That international students be admitted to undergraduate programs using criteria and procedures which ensure, at a minimum, international student quality comparable to that of domestic students; and*
- c. That enrolment targets presented by Faculties and Schools to Senate for approval include specific targets for the number of international students proposed for admission to each Faculty and School for the following academic session.*

Summary:

The provincial government funds UBC for a specified number of domestic undergraduate students (Canadian Citizens and Permanent Residents) and graduate students; ISI international undergraduate students are not funded. For the fiscal year 2015-2016, the provincial government funded UBC Okanagan for 6,971 domestic undergraduate and graduate student FTEs. UBC is committed to managing the admissions process to achieve this mandated number. International students do not displace domestic students in the achievement of this mandate. Current Senate policy on admission of international students limits enrolment to a maximum of 15% of domestic students registered in each program in the previous year. This limit no longer supports the strategic goals and priorities of the University. The Senate Admissions and Awards Committee (SAAC) proposes a revised policy, as per the motions set-out above, that enables the University to meet its internationalization and diversity goals while ensuring that decisions related to international enrolment take account of domestic student access to programs of study, the capacity to accommodate increasing student numbers, and equitable admission standards for international and domestic students. The changes proposed are as follows:

1. That the *Principles of Effective Undergraduate Admission to UBC* (hereafter the *Principles*), which inform all admission policies, be revised to:



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- articulate a commitment to non-displacement of domestic students ('Non-displacement')
 - specify that enrolment will be limited to the number of students the University can provide with an excellent educational experience ('Capacity'),
 - specify that admission will be based on diverse criteria and that the criteria by which applicants will be evaluated will be applied in a fair and consistent manner ('Excellence of Fit'), and
 - reflect the University's goals on internationalization and student diversity ('Alignment with UBC's Vision and Values').
2. That Faculties and Schools set international undergraduate enrolment targets in accordance with the *Principles*.

Background:

The University's strategic plan, *Place and Promise*, emphasizes the importance of creating a learning environment that encourages global citizenship and awareness of global issues, and it identifies internationalization as a core value, principle and goal. The two leading goals in the international engagement strategy are to increase the capacity of UBC students, faculty, staff, and alumni to engage internationally and to strengthen UBC's presence as a globally influential university.

The University has raised its international profile by selectively expanding the number of active partnerships with preeminent international research and teaching institutions in the areas of undergraduate and graduate education and by increasing the number of study abroad initiatives at both the undergraduate and graduate levels. The University has also sought to increase the number of international graduate and undergraduate students enrolled at UBC, and to develop programs and allocate resources to ensure their success. The recruitment of international students to study at UBC and the broad range of international educational experiences now available to all students at UBC serve to diversify the student experience and support the University in its efforts to become a more globally engaged institution.

The current Senate policy (May 15, 1996) on international undergraduate student admission is out of step with the University's international strategic plan and implementation strategy for the plan and does not support the University's strategic goals and priorities. The May 1996 Senate resolution was intended to support the transition from a previous system where fees were not differentiated between international and domestic students to one where non-Canadian students would be charged a higher, "market rate" tuition. It sought to protect the level of access that Canadian citizens and permanent residents had to UBC's undergraduate programs (i.e., non-displacement), and the standards and quality of these programs by setting three conditions for admission of international students to academic programs. The first required that international student admission GPAs meet or exceed those of domestic students. The second set a maximum quota for international students of 15% of the number of domestic students registered in the program the previous year. The third required faculties and schools to identify the number of supernumerary international students – the number of international student places beyond the University's funded capacity – in the annual presentation of admission quotas to Senate. (See Appendix A.)

The University's priorities have changed markedly since 1996. In the present context, internationalization is a core commitment of *Place and Promise*, and market-based tuition for international undergraduate students is a core component of the University's budgetary model. In addition, the University now accepts students on the basis of a Broad Based Admissions process that



includes measures other than GPA. In 2008, Senate approved the Principles of Effective Undergraduate Admission, which need to be taken into account in all admissions policies, including policies relating to international student numbers.

Current UBC Educational Context

A key focus of UBC today is to prepare internationally knowledgeable graduates, who are aware of global issues and of the multiple perspectives on those issues, and able to work in an increasingly globalized world. An important potential site of learning for these students is their interaction with international peers who bring different experiences and perspectives to the University. UBC students themselves see it this way. Undergraduate student respondents to the 2015 New to UBC Survey were asked to rate how important being better able to understand other cultures was in their decision to attend UBC. On a scale of 1 to 5, with 5 being “very important” and 1 being “not important at all,” 41% (n=204) of domestic and 68% (n=50) of international respondents selected a 4 or 5.¹ The benefits are intellectual and practical – employers want students that will be effective working in foreign countries and working in teams of diverse individuals. As President Toohey noted “[i]nter-cultural knowledge, skills and networks ... are essential for individuals and businesses to thrive in today’s global economy”.²

While students themselves see the benefits of international academic engagement, the Canadian and BC governments are also advocating for greater numbers of international post-secondary students. The motivations vary: post-secondary education is seen as an export industry by some, as a source of skilled and talented immigrants by others, as a mechanism to help in capacity building in the developing world by some, and as a means to build international populations familiar with Canadian values and perspectives by others.

The University’s international engagement strategy identifies mechanisms to meet its international commitments in *Place and Promise*, and these include goals of increasing the proportion of international students on campus, as well as expanding exchange programs and international community service learning.

Budgetary Context: Then and Now

In 1996, the contribution of market-based tuition to the University operating budget was very limited, and the target of 15% international undergraduates was considered a distant (potentially unreachable) goal. International student tuition fees were set to reflect the approximate real cost of educating an undergraduate student. The goal was to build a cohort of international students who would pay for their own seats, bring new monies to the University and not reduce the spaces for domestic undergraduates.

Now, international tuition is a significant component of the base operating budgets of both Faculties and central administration. For the Okanagan campus, ISI international tuition revenue for the fiscal year 2015-2016 was approximately \$19 million, representing roughly 16% of the campus operating revenue.

¹Okanagan Planning and Institutional Research.

“Strengthening education and research connectivity between Canada and Asia: Innovative models for engagement” Toohey July 2012 (<http://www.ceocouncil.ca/wp-content/uploads/2012/08/Strengthening-education-and-research-connectivity-between-Canada-and-Asia-Stephen-Toohey.pdf>).



ISI international student enrolment has grown by 106% over the last 5 years and planning assumptions anticipate new ISI international student enrolment increasing at 6% per year over the next five years.³

Undergraduate Student Enrolment Targets

Enrolment targets for domestic undergraduate students are set by the University in response to the Provincial government's funded Full-Time Equivalent (FTE) seats. The total number of funded FTE seats are set by the Province annually, in the Provincial Letter, and constitute the main source of funding for the University. For the 2015-2016 fiscal year, the government-funded domestic undergraduate and graduate FTE is 6,971. The University endeavors to match actual domestic enrolments with the provincial targets through its admission targets. These are set in terms of head count, and are intended to enable the University to maintain overall domestic undergraduate enrolments by anticipating flow through and completion rates. Costs are incurred from carrying domestic student FTE above Provincially funded rates, because domestic student tuition alone does not cover the actual costs of educating a student.

By contrast, enrolment targets for international undergraduate students are set by the University based on its strategic goals and physical, instructional and support services capacities. International undergraduate student tuition covers the full cost of educating the student and thereby helps fund the fixed overhead costs for all students. Included in the latter are physical, instructional and student support services that benefit all students, domestic and international. Approximately one-half of Okanagan ISI international student tuition revenue is allocated to the Okanagan Faculties (allocated on the basis of course taught FTE to the teaching faculty) and approximately one-half is allocated to Okanagan central administration. Accordingly, international students strengthen the University not only through their participation and engagement on campus but also by supporting the fiscal capacity of the University.

Undergraduate Student Admissions Criteria

The University's domestic student admission criteria are set on the basis of demand for the number of domestic undergraduate seats which, as noted above, is set on the basis of provincially funded FTE seats. Demand for domestic seats is mainly a local condition (67% of new domestic direct-entry registrants were from BC schools for the 2015 Winter Session). By comparison, demand for international student seats reflects global markets and global trends. UBC competes for international student applicants with a wide range of other institutions all over the world that aggressively recruit in the same markets. These institutions employ a variety of measures to gain students, including differentiated admissions. One of these is the 'international pathways' approach, which is intended to accommodate high achieving students in a transition program that assists them with English language. At UBC Okanagan, the English Foundations Program and Vantage College provide such pathways.

International Student Enrolment Targets and Admissions Criteria Revisited

SAAC supports replacing the quota system in the 1996 resolution with a principles-based approach that sets enrolment targets for international undergraduate students on the basis of the University's goal to

³ Growth from 409 students in 2010 to 841 in 2015. *Okanagan Planning and Institutional Research*.



become a global institution and its capacity to provide all of its students, domestic and international, with an excellent educational experience. In accordance with the *Principles of Effective Undergraduate Admission*, SAAC is advising that international undergraduate student admission criteria can and should be set on the basis of the University's strategic priorities, the capacity to provide all students with an excellent educational experience, and on an evidence-based review that would identify predictive criteria for international students who will prosper at UBC.

Expansion of international undergraduate seats is in line with the Provincial mandate to develop a highly internationalized education system. With respect to fiscal planning, international student tuition revenue can benefit the entire undergraduate student population and teaching enterprise through contributing to recruitment and retention of top quality faculty, provision of additional course sections that reduce class size and increase the breadth of offerings, expansion of library collections and services for students, and construction of new and renewal of existing instructional spaces, equipment and technology. International students strengthen the University not just through their presence and engagement on campus but also by supporting the fiscal capacity of the University.

For the 2015 Winter Session, there were 841 ISI international undergraduate students registered in undergraduate degree programs on the Okanagan campus, comprising 11% of the undergraduate student population (n=7,668). These students came from 83 different countries, but China and the US are home to approximately 38% (n=316, Table 3). The campus-wide proportion of international students incorporates the widely divergent share of international students in different programs and Faculties as demonstrated by the proportions in undergraduate direct entry degree programs in Table 4. The University is currently targeting a 6% annual increase in new ISI international undergraduate degree student enrolments.

Revised Principles of Effective Undergraduate Admission to UBC

The 2008 Senate-approved Principles provide guidance for decision-making around student admissions. The proposed revisions to the Principles, set out in the attached draft document, reflect the importance of internationalization in the context of University admissions and the learning environment.

A key component of the revised Principles is non-displacement of domestic students. The principle of 'Non-displacement' specifies that international students will not displace domestic students. In addition, it specifies that the University will meet its provincially mandated enrolment targets for Canadian citizens and permanent residents and that all provincially funded seats will continue to be occupied by Canadian citizens and permanent residents of Canada.

The revised Principles also reflect the importance of considering capacity and resources in decisions related to both international and domestic enrolment. A fundamental principle of effective admission is to ensure that the University provides every student with a rewarding and complete learning experience and only admits a number that can be assured of such an experience. Going forward, the Committee emphasizes that the University (and Faculties) must carefully consider resource and capacity implications when setting international enrolment targets.



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Respectfully submitted,

Dr. Patricia Lasserre

Associate Provost, Enrolment and Academic Facilities

Dr. Marianne Legault,

Chair Senate Admissions and Awards Committee



Table 1: UBCO Undergraduate Program Normal Load FTEs (Domestic)

Winter Session

Forecast →

UBCO Domestic Undergraduate and Graduate Normal Program Load FTE

By Fiscal Year

	Actual					Forecast
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
Undergraduate	6,059	6,348	6,295	6,021	6,039	6,333
Winter	5,706	5,944	5,912	5,637	5,677	5,949
Applied Science	603	644	689	719	804	904
Arts and Sciences	3,021	3,205	3,141	2,946	2,925	2,982
Education	205	200	201	205	174	145
Creative and Critical Studies	290	263	258	239	207	177
Health and Social Development	939	968	996	949	1,017	1,124
Management	581	598	559	521	491	548
Non-Degree	67	67	69	57	57	70
Summer	353	403	383	384	362	384
Graduate	549	544	557	606	621	637
Grand Total	6,608	6,892	6,852	6,628	6,660	6,971
Funded FTE	6,923	6,923	6,947	6,971	6,971	6,971
Utilization Rate (%)	95%	100%	99%	95%	96%	100%

Notes:

Winter Session totals are valid as of March 1 of each year.

Summer Session totals are valid as of August 1 of each year.

Forecasts for 2016/17 are per Senate Enrolment Target Forecast.

Forecasted domestic undergraduate FTE totals for the 2016 Winter Session have been adjusted for attrition.

Non-Degree total includes Education certificate and diploma programs.

NOTE: Includes all undergraduate direct entry, post-baccalaureate, diploma, certificate and non-degree students



Table 2: UBCO, Headcount Enrolment by Visa Status

UBCO Winter Session Headcount Enrolment

By Visa Status

	2012/13				2013/14				2014/15				2015/16			
	Dom	Int'l	Total	% Int'l	Dom	Int'l	Total	% Int'l	Dom	Int'l	Total	% Int'l	Dom	Int'l	Total	% Int'l
Graduate	499	146	645	23%	481	159	640	25%	486	196	682	29%	509	215	724	30%
Doctoral Degree	139	77	216	36%	143	83	226	37%	148	104	252	41%	153	105	258	41%
Masters Degree	360	69	429	16%	338	76	414	18%	338	92	430	21%	356	110	466	24%
Undergraduate	7,107	560	7,667	7%	7,089	659	7,748	9%	6,770	762	7,532	10%	6,811	857	7,668	11%
Baccalaureate D	6,713	551	7,264	8%	6,691	649	7,340	9%	6,407	697	7,104	10%	6,442	820	7,262	11%
Diploma & Certi	5	-	5	0%	2	-	2	0%	42	-	42	0%	35	-	35	0%
Non-Degree	206	9	215	4%	213	10	223	4%	138	64	202	32%	170	37	207	18%
Post-Baccalaure	183	-	183	0%	183	-	183	0%	183	1	184	1%	164	-	164	0%
Grand Total	7,606	706	8,312	8%	7,570	818	8,388	10%	7,256	958	8,214	12%	7,320	1,072	8,392	13%

Notes:

Headcount totals are unique and valid as of November 1.

International undergraduate headcount totals reflect visa status, not tuition fees paid (ISI). Therefore, totals will exceed ISI international headcount in each year.

Includes registered and continuously registered (in the case of graduate students) students.



Table 3: International Undergraduate Enrolment by Country of Citizenship

By Country of Citizenship

Country	2005/06	As %	2015/16	As %
China	39	48%	257	31%
United States	6	7%	59	7%
India	2	2%	42	5%
Korea, South	9	11%	37	4%
Japan	10	12%	31	4%
Hong Kong	1	1%	27	3%
Taiwan	1	1%	23	3%
Kenya		0%	21	2%
Pakistan	1	1%	20	2%
Bangladesh		0%	18	2%
Mexico		0%	16	2%
United Kingdom	2	2%	15	2%
Other	11	13%	275	33%
Grand Total	82	100%	841	100%

Notes:

Headcount totals are unique and valid as of November 1. Includes registered student records only.



Table 4: ISI as a Proportion of Total Direct Entry Undergraduate Degree Programs

Undergraduate Direct-entry Programs

	Actual					Forecast	Actual (Sept 1 st)
	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2016/17
Arts and Sciences	7%	7%	9%	10%	12%	12%	13%
BA-O	8%	8%	9%	11%	13%	15%	14%
BSC-O	6%	7%	8%	8%	10%	10%	12%
PHAR-O	2%	0%	0%	0%	0%	0%	0%
Creative and Critical Studies	4%	6%	5%	4%	6%	8%	5%
BA-O	3%	4%	3%	2%	2%	1%	1%
BFA-O	6%	7%	7%	7%	13%	16%	9%
Applied Science	6%	7%	7%	7%	11%	13%	13%
BASC-O	6%	7%	7%	7%	11%	13%	13%
Health and Social Development	1%	1%	0%	0%	1%	1%	1%
BAHS-O	0%	0%	0%	0%	0%	0%	0%
BHK-O	1%	1%	0%	1%	1%	1%	2%
BSN-O	0%	0%	0%	0%	0%	0%	0%
Management	16%	20%	25%	28%	28%	27%	29%
BMGT-O	16%	20%	25%	28%	28%	29%	29%
Grand Total	7%	8%	9%	10%	11%	12%	12%

Notes:

Headcount totals are unique and valid as of November 1.

Headcounts totals are unique and valid as of September 1 for current year forecast.

Excludes Non-Degree Studies, post-baccalaureate programs (Education), and undergraduate programs which cannot be entered into directly (e.g. BSW-O).



Appendix A – May 1996 Senate Resolution

On May 15, 1996, Senate approved a three-part resolution regarding admission of international undergraduate students, as follows:

That international students be admitted to undergraduate programs at a GPA or admission average that is no lower than the minimum GPA or admission average applicable to Canadians or permanent residents of Canada entering the same program, i.e., that the present differential GPA applied to domestic and international applicants be discontinued.

That the maximum number of international students admitted to and registered in an undergraduate program in any year be established at 15% of the number of Canadians and permanent residents registered in that program in the previous year.

That faculties and schools, in presenting admission quotas to Senate for approval, also be required to present for approval the number, if any, of supernumerary international students they expect to admit.

Revised Principles of Effective Undergraduate Admission to UBC

<p><u>REVISED PRINCIPLES OF EFFECTIVE UNDERGRADUATE ADMISSION TO UBC</u> (20 MARCH 2014)</p> <p>ALIGNMENT WITH UBC'S VISION AND VALUES</p> <p>Admission policies shall ensure that the institution attracts the best undergraduate students from across BC, Canada and the world. Students admitted to the University shall be predisposed to take advantage of the opportunities to seek academic challenge, to do research, to develop leadership skills, to do community service, to foster global awareness, and to participate in sports and the fine and performing arts.</p> <p><i>Corollary:</i> Policies or practices that encourage top-quality student applicants will be identified and reviewed.</p> <p><i>Corollary:</i> Where two or more principles are in conflict, the resolution should always aim to achieve the overall vision and values of the University.</p> <p>EVIDENCE-BASED POLICY REVIEW:</p> <p>Admission criteria will be based on knowledge of the strengths and weaknesses of educational systems world-wide and of student performance at UBC.</p> <p><i>Corollary:</i> Student achievement at UBC will be used regularly to review and modify admission policies and practices, and to identify areas of potential improvement in UBC curricula and pedagogy.</p> <p><i>Corollary:</i> The University needs the ability to forecast changes in demand for programs so that policies can be adapted within this framework of principles.</p>	<p><u>PRINCIPLES OF EFFECTIVE UNDERGRADUATE ADMISSION TO UBC</u> (APPROVED BY VANCOUVER SENATE ON 9 MAY 2008 AND OKANAGAN SENATE ON NOVEMBER 5 2008)</p> <p>ALIGNMENT WITH UBC'S GOALS:</p> <p>Admission policies shall ensure that the institution "...attracts and retains the best undergraduate and graduate students from across BC, Canada and the world" (Trek 2040). Such students should be predisposed to take advantage of the opportunities to seek academic challenge, to do research, to develop leadership skills, to do community service, to foster global awareness, and to participate in sports and the fine and performing arts.</p> <p><i>Corollary:</i> Policies or practices that encourage the enrolment of top-quality students will be identified and reviewed.</p> <p><i>Corollary:</i> Where two or more principles are in conflict, the resolution will always aim to achieve the overall goals of the University.</p> <p>EVIDENCE-BASED POLICY REVIEW:</p> <p>Admission criteria will be based on knowledge of the strengths and weaknesses of educational systems world-wide and of student performance at UBC.</p> <p><i>Corollary:</i> Student achievement at UBC will be used regularly to review and modify admission policies and practices, and to identify areas of potential improvement in UBC curricula and pedagogy.</p> <p><i>Corollary:</i> The University needs the ability to forecast changes in demand for programs so that policies can be adapted within this framework of principles.</p>
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<p>EXCELLENCE OF FIT:</p> <p>Evaluation criteria will aim to identify those applicants who are most likely to prosper at the University of British Columbia.</p> <p><i>Corollary:</i> General university admission criteria shall identify where possible common core academic requirements for admission to all undergraduate programs.</p> <p><i>Corollary:</i> Admission criteria for specific UBC programs shall be based on the framework of the general admission criteria.</p> <p><i>Corollary:</i> In addition to evidence of academic achievement, diverse admission criteria may be used (i.e., broader-based admission)</p> <p><i>Corollary:</i> The criteria by which applicants are evaluated for excellence of fit shall be applied in a fair and consistent manner.</p> <p>FAIRNESS:</p> <p>Applicants will not be disadvantaged by the structure (timing, sequencing, grading schemes) of the educational system followed that provides the basis of admission.</p> <p><i>Corollary:</i> Fair and equitable treatment of applicants does not require the application of identical policies and practices because to do so would be to ignore the different educational backgrounds and needs of prospective students.</p> <p><i>Corollary:</i> What is considered sufficient evidence of readiness to succeed may differ for different academic programs.</p> <p><i>Corollary:</i> Grading schemes will not be equated to the BC high school system unless data on student performance support such a practice.</p> <p><i>Corollary:</i> Applicants who are continuing UBC students wishing to change program will not be</p>	<p>EXCELLENCE OF FIT:</p> <p>Evaluation criteria will aim to identify those applicants who are most likely to prosper at the University of British Columbia.</p> <p><i>Corollary:</i> General university admission criteria shall identify where possible common core academic requirements for admission to all undergraduate programs.</p> <p><i>Corollary:</i> Admission criteria for specific UBC programs shall be based on the framework of the general admission criteria.</p> <p><i>Corollary:</i> In addition to evidence of academic achievement, diverse admission criteria may be used (i.e., broader-based admission).</p> <p>FAIRNESS:</p> <p>Applicants will not be disadvantaged by the structure (timing, sequencing, grading schemes) of the educational system followed that provides the basis of admission.</p> <p><i>Corollary:</i> Fair and equitable treatment of applicants does not require the application of identical policies and practices because to do so would be to ignore the different educational backgrounds and needs of prospective students.</p> <p><i>Corollary:</i> What is considered sufficient evidence of readiness to succeed may differ for different academic programs.</p> <p><i>Corollary:</i> Grading schemes will not be equated to the BC high school system unless data on student performance support such a practice.</p> <p><i>Corollary:</i> Applicants who are continuing UBC students wishing to</p>
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<p>disadvantaged as long as they are in good academic standing in their current program.</p> <p>INTEGRITY:</p> <p>Admission practices shall conform to policies.</p> <p>TRANSPARENCY:</p> <p>Admission requirements shall be clear and understandable to prospective students, counsellors, and others who influence student choice.</p> <p><i>Corollary:</i> The University will be open in its communication of admission policies and practices as long as doing so does not compromise the integrity of the admission decision.</p> <p>TIMELINESS:</p> <p>An offer will be made in time for the applicant to plan for the transition to UBC and for UBC to meet its enrolment targets.</p> <p><i>Corollary:</i> Applicants must know the terms of an offer from UBC in time to compare it to offers from other institutions and to make reasonable financial and relocation plans for the eventual transition to UBC.</p> <p><i>Corollary:</i> To attract excellent applicants, UBC must render admission decisions in a timely manner. Timeliness is determined by both the University's enrolment management needs and common practices and expectations within the applicant's home jurisdiction. As most offers will be made prior to the completion of the academic year, final grades are used primarily to confirm offers of admission made on interim grades.</p> <p><i>Corollary:</i> Some applicants may be able to present evidence of readiness</p>	<p>change program will not be disadvantaged as long as they are in good academic standing in their current program.</p> <p>INTEGRITY:</p> <p>Admission practices shall conform to policies.</p> <p>TRANSPARENCY:</p> <p>Admission requirements shall be clear and understandable to prospective students, counsellors, and others who influence student choice.</p> <p><i>Corollary:</i> The University will be openly and direct in its communication of admission policies and practices.</p> <p>TIMELINESS:</p> <p>An offer will be made in time for the applicant to plan for the transition to UBC and for UBC to meet its enrolment targets.</p> <p><i>Corollary:</i> Applicants must know the terms of an offer from UBC in time to compare it to offers from other institutions and to make reasonable financial and relocation plans for the eventual transition to UBC.</p> <p><i>Corollary:</i> To attract excellent applicants, UBC needs to make most offers before May 4th, which probably means that final grades cannot be considered from most educational jurisdictions and systems.</p> <p><i>Corollary:</i> Some applicants may be able to present evidence of readiness</p>
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<p>for success earlier than others so some offers of admission may be made much earlier than others using different sets of data.</p> <p>COMPREHENSIVENESS:</p> <p>The terms of an offer of admission will include space in an academic program, and space in student housing and financial support when applicable</p> <p><i>Corollary:</i> The application processes and decision timelines for both entry into academic programs and space in student housing must be linked because the allocation of student housing spaces must be part of a larger strategy for effective student recruitment.</p> <p><i>Corollary:</i> Offers of admission to an academic program and of merit-based financial assistance should be made at the same time based on similar sets of data because the allocation of scholarships must be part of a larger strategy for effective student recruitment.</p> <p>COMMITMENT:</p> <p>An offer of admission will not be revoked unless the applicant does not meet a minimum set of conditions that are conveyed with the offer.</p> <p><i>Corollary:</i> An applicant offered admission will in turn be expected to make a firm commitment to the university.</p> <p><i>Corollary:</i> The minimum conditions for retention of an offer of admission will be reviewed and modified regularly to ensure that as many students as possible succeed academically.</p> <p><i>Corollary:</i> All direct-entry programs will adhere to a minimum set of conditions for retention of offers of admission as identified on the letter of admission.</p>	<p>for success earlier than others so some offers of admission may be made much earlier than others using different sets of data.</p> <p>COMPREHENSIVENESS:</p> <p>The terms of an offer of admission will include space in an academic program, and space in student housing and financial support when applicable.</p> <p><i>Corollary:</i> The application processes and decision timelines for both entry into academic programs and space in student housing must be linked because the allocation of student housing spaces must be part of a larger strategy for effective student recruitment.</p> <p><i>Corollary:</i> Offers of admission to an academic program and of merit-based financial assistance should be made at the same time based on similar sets of data because the allocation of scholarships must be part of a larger strategy for effective student recruitment.</p> <p>COMMITMENT:</p> <p>An offer of admission will not be revoked unless the applicant does not meet a minimum set of conditions that are conveyed with the offer.</p> <p><i>Corollary:</i> An applicant offered admission will in turn be expected to make a firm commitment to the university.</p> <p><i>Corollary:</i> The minimum conditions for retention of an offer of admission will be reviewed and modified regularly to ensure that as many students as possible succeed academically.</p> <p><i>Corollary:</i> All direct-entry programs shall adhere to a common minimum set of conditions for retention of offers of admission.</p>
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SENATE-APPROVED ENROLMENT TARGETS

Enrolment will be limited to the number of students the University can provide with an excellent educational experience as determined by the Senate-approved enrolment targets.

Corollary: Student demand for admission relative to Senate-approved targets shall determine competitive admission standards.

NON-DISPLACEMENT:

International students shall not displace Canadian citizens and permanent residents for admission to the University.

Corollary: The University shall meet its provincial enrolment mandate for Canadian citizens and permanent residents of Canada.

Corollary: All provincially funded seats shall be occupied by Canadian citizens and permanent residents of Canada.



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8 May 2017

To: Okanagan Senate

From: Admissions and Awards Committee

Re: Annual Report – Matters of Delegated Authority

- a. Appeals on Applications for Admission, Readmission and Transfer to Programs
- b. Non-substantive or Editorial changes to Existing Admission Requirements
- c. Student Mobility Agreements Approved Under Council of Senates Policy C-2: *Affiliations with Other Institutions of Learning*

a. Appeals on Applications for Admission, Readmission and Transfer to Programs

Pursuant to section 37(1) (b) of the *University Act*, the Okanagan Senate has delegated to the Admissions and Awards Committee the authority to hear final appeals on applications for admission and readmission to the University. In compliance with the *Rules and Procedures of the Okanagan Senate*, the Committee herein reports on its decisions.

Between May 1, 2016 and April 30, 2017, the Admissions and Awards Committee heard 17 student appeals for admission to a degree program (compared to 18 in 2015/16, 11 in 2014/15, 12 in 2013/14, 13 in 2012/13, 14 in 2011/12 and 17 in 2010/11). Appeals can be allowed (and the applicant admitted) or dismissed. Of the appeals heard by the Committee, 5 were allowed and 12 were dismissed.

In brief:

- 4 to the Bachelor of Arts (1 allowed)
- 6 to the Bachelor of Science (3 allowed)
- 1 to the Bachelor of Human Kinetics (1 allowed)
- 2 to the Bachelor of Management (0 allowed)
- 1 to the Bachelor of Applied Science (0 allowed)
- 1 to the Bachelor of Fine Arts (0 allowed)
- 1 to the Bachelor of Education-ETEP (0 allowed)
- 1 to the Bachelor of Science in Nursing (0 allowed)

b. Non-substantive or Editorial changes to Existing Admission Requirements

In January 2016, Senate delegated to the Committee final right of approval over non-substantive and editorial changes to existing admission requirements. From May 1, 2016 until April 30, 2017 the Admissions and Awards Committee has approved zero proposals under delegated authority.

c. Student Mobility Agreements Approved Under Council of Senates Policy C-2: *Affiliations with Other Institutions of Learning*

Under Policy C-2: *Affiliations with Other Institutions of Learning*, the Council of Senates has delegated to the Admissions and Awards Committee the authority to approve on its behalf, terms of student mobility agreements for students going to or coming from UBC Okanagan programs.

In 2016-2017, the Admissions and Awards Committee has approved student mobility agreements with the following institutions:

- Delft University of Technology
- Chongqing University
- Chongqing Normal University
- Southwest University of Political Science and Law
- Sichuan International Studies University

For the Committee,

Dr. Marianne Legault
Chair, Admissions and Awards Committee



To: Senate
From: Agenda Committee
Date: 8 May 2017

Re: Amendments to the *Rules and Procedures of Senate*

As part of the triennial review, the Senate Nominating Committee has brought to our attention several recommendations regarding *Rules and Procedures of Senate* and in particular, the offices of chairs and vice-chairs Senate committees. The current *Rules and Procedures of Senate* may be found online at <https://senate.ubc.ca/okanagan/rules>

Presently, each Senate Committee elects a chair at least triennially. Several senators multiple committees. The presenter of this report chairs three. The Agenda Committee agrees that the elected chair is an important democratic principle that should be maintained; however, improvements are suggested to ensure a better apportionment of work among senators (by mandating that normally a senator shall not chair more than one committee), to help identify successors for chairs (by formalizing the practice of having a committee vice-chair), and to better ensure renewal in Senate Committees (by limiting the amount of time a senator may chair a particular committee). The Agenda Committee notes that should extraordinary circumstances arise where such changes would not be to Senate's benefit, Senate may, by resolution, amend or suspend these rules as per Rule 4 of the *Rules and Procedures of Senate*.

To that end, the Senate Agenda committee is pleased to recommend:

That the Rules and Procedures of Senate be amended to add the following new sections and that subsequent sections of the Rules and Procedures of Senate and any referential section numbers be renumbered accordingly, effective 1 October 2017:

“37. All Senate committees shall elect a chair and a vice-chair from amongst their members who are senators at least triennially.”

“38. Except for the Senate Agenda Committee and those committees established to ensure representation on the Council of Senates, no senator shall chair more than one standing committee of Senate.”

“39. No Senator shall serve as chair of a standing committee of Senate for more than six (6) consecutive years.”



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8 May 2017

To: Okanagan Senate

From: Appeals of Standing and Discipline Committee

Re: Annual Report 2016-2017 (information)

Committee Terms of Reference:

Delegated Authority over the following by Senate:

- A. Appeals of decisions of the President on student discipline;
- B. Appeals of final decisions of Faculties on academic standing; and
- C. Appeals of final decisions of Faculties on promotion/advancement.

The Okanagan Senate Appeals of Standing and Discipline Committee is a standing committee of the Okanagan Senate established under section 37(1)(v) of the *University Act* R.S.B.C. 1996, c.468 (the “*Act*”) as the “standing committee of final appeal for students in matters of academic discipline.” The Committee also serves as the mechanism for student appeals of faculty decisions under section 40(g) of the *Act*.

As per Part 5, Section 37(a) of the *Rules and Procedures of the Okanagan Senate*, and following general legislative practice for a standing committee exercising delegated authority of a larger assembly, the Committee makes an annual report to Senate including the number of appeals heard, their disposition, and the general nature of the appeals.

The following provides a brief outline of disciplinary and academic standing appeals along with a summary of appeals considered by the Committee during the period 1 May 2016 to 30 April 2017.

A. Student Discipline

Under section 61(1) of the *Act*, the “president has power to suspend a student and to deal summarily with any matter of student discipline.” Under section 61(2) of the *Act*, the President “must promptly report the action to the standing committee established under section 37(1)(v) with a statement of his or her reasons.” Under section 61(3) of the *Act*, the “action of the president is final and subject in all cases to an appeal to the senate.”

Student discipline is governed by the Policies and Regulations section of the UBC Okanagan Academic Calendar (see UBC Okanagan Academic Calendar Policies and

Regulations, Student Discipline
<http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,54,0,0>).

1. Academic Misconduct

During the Period 1 May 2016 to 30 April 2017, the Senate Committee received no appeals involving students disciplined for academic misconduct by the President upon the recommendation of the President's Advisory Committee on Student Discipline.

2. Non-academic Misconduct

During the period 1 May 2016 to 30 April 2017, the Committee received one appeal involving a student disciplined by the President upon the recommendation of the President's UBC Okanagan Non-Academic Misconduct Committee.

The student was disciplined for non-academic misconduct for physically assaulting a fellow UBC student and for failure to comply with the terms of a previous disciplinary measure. The discipline imposed by the President was suspension from the University for a period of 2 years, prohibition from being on campus grounds for the length of the suspension and a notation of non-academic misconduct entered on the student's transcript (to be removed upon lapsing of the suspension). The student appealed on the following four grounds:

- 11.4(1) That the President incorrectly determined that the conduct of the student, either admitted or as found by the President, constitutes misconduct or the President incorrectly applied a University policy or procedure. Where the appeal is under paragraph 11.4 (1), the appropriate standard of review is correctness. The Senate Committee may reverse or vary the President's decision or substitute its own decision if it disagrees with the President's determination or application of a University policy or procedure. The Committee found the President's decision to be correct.
- 11.4(4) That the procedure of the President's Committee was unfair or operated unfairly, in that there was bias or a lack of independence in the President's Committee, or the President's Committee's procedures were unfairly applied or breached, or that the President gave insufficient reasons for his or her decision.

Where the appeal is under section 11.4 (4), the appropriate standard of review is whether a reasonable person, knowledgeable about the facts, would perceive the process at or before the President's Committee to be unfair. If the Senate Committee finds this to be the case, it will refer the matter back to the President's Committee for a rehearing, or with the consent of the student and the Initiator, reverse or vary the President's decision or substitute its own decision. The Senate Committee found that a reasonable person, knowledgeable about the facts, would perceive the process to be fair.

- 11.4(5) That the President erred in the President's assessment of the evidence in the President's Committee's report, including any factual inferences made by the President, or the credibility of the student or other witnesses.

Where the appeal is under paragraph 11.4 (5), the appropriate standard of review is reasonableness. The Senate Committee may reverse or vary the President's decision or substitute its own decision only if the President's assessment of the evidence in the President's Committee's report, including any factual inferences made by the President or the credibility of the student or other witnesses, is unreasonable. The Senate Committee found that the President's assessment of the evidence in the President's Committee's report was reasonable.

- 11.5(6) That the discipline imposed by the President was excessive.

Where the appeal is under paragraph 11.4 (6), the appropriate standard of review is reasonableness. The Senate Committee may reverse or vary the President's decision or substitute its own decision only if the exercise of the President's discretion with respect to the academic discipline imposed is unreasonable. The Senate Committee found that the discipline imposed by the President was not excessive.

Appeal Dismissed.

B. Academic Standing

The Okanagan Senate has delegated to the Appeals of Standing and Discipline Committee the authority to hear and dispose of student appeals from decisions of faculties in matters of academic standing. The Committee shall allow an appeal where it is decided that the decision of the Faculty was arrived at through improper or unfair procedures, and that as a result, a wrong decision may have been arrived at. However, the Committee has no jurisdiction where the sole question raised in an appeal turns on the exercise of academic judgment by a faculty member. The Okanagan Senate has conferred on the Committee the power to make final decisions pursuant to section 37(1)(b) of the *Act* (see UBC Okanagan Academic Calendar, Policies and Regulations, Senate Appeals on Academic Standing, section 2: <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,53,106,0>).

Students may also appeal to the Committee for contravention of procedure with respect to a Review of Assigned Standing in a Course (see UBC Okanagan Academic Calendar, Policies and Regulations, Review of Assigned Standing in a Course: <http://www.calendar.ubc.ca/okanagan/index.cfm?tree=3,294,0,0>).

An appeal allowed by the Committee shall be by:

- reversal of the decision of the Faculty, and the granting of such academic standing to the appellant as the Committee thinks fit in the circumstances; or
- quashing of the decision of the Faculty, and the sending of the matter back to the Faculty to be dealt with in accordance with proper procedures.

1. Academic Standing

During the period 1 May 2016 to 30 April 2017, the Committee heard 3 appeals on academic standing:

- The student appealed a decision of the Faculty requiring the student's withdrawal from the program following a failed year. The Committee dismissed the appeal and held that the Faculty's decision was not based on improper or unfair procedures, nor was there consideration of any information that ought not to have been considered, nor was there a failure to consider information that ought properly to have been considered.

Appeal Dismissed.

- The student appealed a decision of the Faculty regarding the student's academic standing in two courses. The Committee upheld the Faculty's decision regarding academic standing for one of the two courses.

For the second course, the Committee held that the Faculty's decision had been arrived at through improper and unfair procedures, and that as a result, a wrong decision may have been arrived at. The Committee overturned the Faculty's decision and granted such academic standing as it saw fit in the circumstances, namely that the student be permitted to repeat the course.

Appeal allowed in part.

- The student appealed a decision of the Faculty regarding the student's withdrawal from the program for failing to meet program requirements. The Committee held that the Faculty's decision had been arrived at through improper and unfair procedures, and that as a result, a wrong decision may have been arrived at. The Committee overturned the Faculty's decision and reinstated the student to the program.

Appeal Allowed.

Respectfully submitted,

Dr. Robert Campbell, Chair
Appeals of Standing and Discipline Committee

Members of the Committee:

Dr. Robert Campbell (Chair)
Dr. Lawrence Berg
Dr. Diana Carter
Ms. Jeanette Vinek
Mr. Jamie McEwan
Dr. Myron Campbell
Mr. Jason Lammars
Ms. Amy Park



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18 May 2017

To: Okanagan Senate
From: Curriculum Committee
Re: Curriculum Proposals (approval)

The Curriculum Committee has reviewed the material forwarded to it by the Faculties and encloses those proposals it deems ready for approval.

Therefore, the following is recommended to Senate:

Motion: *That Senate approve and recommend to the Board of Governors for approval four new courses brought forward from the Faculty of Arts and Sciences, and one new course, one new program and one discontinued program brought forward from the Faculty of Creative and Critical Studies.*

- a. From the Faculty of Arts and Sciences
 - i. GEOG 318 (3) Rural Geographies (new course)
 - ii. MATH 462 (3) Derivative-Free Optimization (new course)
 - iii. MATH 562 (3) Derivative-Free Optimization (new course)
 - iv. MATH 510 (3) General Topology (new course)
- b. From the Faculty of Creative and Critical Studies
 - i. ENGL 458 (3) Canadian Environmental Writing (new course)
 - ii. BA Minor in Theatre (new program)
 - iii. BFA Minor in Interdisciplinary Performance (discontinued program)

For the Committee,

Dr. Peter Arthur
Chair, Curriculum Committee



Curriculum Proposal Form

New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: IKBSAS Dept./Unit: 1 CCGS Faculty/School Approval Date: 20170320 Effective Session: 2017W	Date: 20170130 Contact Person: Dr. D. Senese Phone: 250.807.9372 Email: donna.senese@ubc.ca
Type of Action: New Course	
Rationale: This course fills a gap in the Geography program, providing content for two important existing and developing streams in GEOG: Natural Environments and Food Systems.	
Proposed Academic Calendar Entry: <u>GEOG 318 (3) Rural Geographies</u> <u>Geographic perspectives in contemporary rural geography. Specific attention is given to social and environmental change, conflict and sustainability in Canadian and global contexts. Themes include transformations in the use of rural resources in agricultural, food, migration, and tourism production and consumption. Students are required to participate in short field trips and must arrange own transportation to/from sites within the Okanagan. [3-0-0]</u> <u>Prerequisite: GEOG 128, 129 and third-year standing.</u>	Draft Academic Calendar URL: N/A Present Academic Calendar Entry: N/A



Curriculum Proposal Form

New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: IKBSAS Dept./Unit: Unit 5 Faculty/School Approval Date: 20170320 Effective Session: 2017W	Date: 2016/11/16 Contact Person: Dr. Warren Hare Phone: 250.807.9378 Email: Warren.Hare@ubc.ca
Type of Action: New Course	
Rationale: These courses have been offered 3 times in the last 5 years under the listings “MATH 430B Special Topics in Optimization and Analysis – DERIV FREE OPT” and “MATH 604A Topics in Optimization - DERIV FREE OPT”. Moving it from a topics course to a properly listed course gives it recognition as regularly offered material.	
Proposed Academic Calendar Entry: <u>MATH 462 (3) Derivative-Free Optimization</u> <u>Mathematical analysis and development of derivative-free optimization methods. Heuristic methods, direct search methods, model-based methods, convergence analysis, topics in implementation and testing. Credit will be granted for only one of MATH 462 or MATH 562. [3-0-0]</u> <u>Prerequisite: All of MATH 200, MATH 220 and MATH 221. MATH 303 or COSC 303 is recommended.</u> <u>MATH 562 (3) Derivative-Free Optimization</u> <u>Mathematical analysis and development of derivative-free optimization methods. Heuristic methods, direct search methods, model-based methods, convergence analysis, topics in implementation and testing. Credit will be granted for only one of MATH 562 or MATH 462. [3-0-0]</u>	Present Academic Calendar Entry: N/A



Curriculum Proposal Form

New/Change to Course/Program – Okanagan campus

Category: 1	
Faculty/School: IKBSAS Dept./Unit 5 Faculty/School Approval Date: 20170320 Effective Session: 2017W	Date: 2016-12-05 Contact Person: Dr. J. Tavakoli Phone: 250.807.9535 Email: javad.tavakoli@ubc.ca
Type of Action: New Course	
Rationale: This course has been offered before under Special Topics in Mathematics. Here we emphasize the applications of Topological spaces.	
Proposed Academic Calendar Entry: <u>Math 510 (3) General Topology</u> <u>Topological spaces, interior, closure, and boundary of a set, creating new topological spaces, quotient spaces: examples and applications, continuous functions and homeomorphism, metric spaces & metrizability, connectedness, compactness, countability and separation axioms, applications chosen from the above topics. [3-0-0]</u> <u>Prerequisite: MATH 327.</u>	Present Academic Calendar Entry: N/A



Curriculum Proposal Form New/Change to Course/Program – Okanagan Campus

Category 1	
Faculty/School: FCCS Dept./Unit: English Faculty/School Approval Date: 2017/02/21 Effective Session: 2017W	Date: 11/04/14 Contact Person: Dr Greg Garrard Phone: 250.807.8479 Email: greg.garrard@ubc.ca
Type of Action: New course.	
Rationale: <p>Eco Cultures is one of the FCCS Priority Research Areas, a designation that encompasses environmental literature, ecocriticism and critical animal studies. Researchers in this area are bringing forward a package of new courses that would provide interested students with a pathway through their degree with a focus on animals and/or the environment. The proposed course would also be available within the ‘Sustainability’ major, which is currently being developed. It could be offered at Bamfield Marine Sciences Centre as a place-based course.</p> <p>‘Canadian Environmental Writing’ will allow students to extend the area of study introduced by ENGL397 ‘Contemporary Environmental Writing’ and/or provide an advanced topical focus for students pursuing interests in Canadian culture. The course will question the ways in which cultures of nature brought to Canada by Anglophone and other immigrants have conflicted with or been modified by the perspectives of Indigenous inhabitants and later generations of settlers.</p>	



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THE UNIVERSITY OF BRITISH COLUMBIA

<p>Proposed Academic Calendar Entry:</p> <p><u>ENGL458(3) Canadian Environmental Writing</u></p> <p><u>Offers advanced study of ecocritical theory and its application to Canadian literature, including Indigenous authors. [3-0-0]</u></p> <p><u>Pre-requisite: 9 credits of 300-level English.</u></p>	<p>Draft Academic Calendar URL: N/a</p> <p>Present Academic Calendar Entry: None</p>
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Curriculum Proposal Form
New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: FCCS Dept./Unit: Creative and Critical Studies Faculty/School Approval Date: 2017/02/21 Effective Session: 2017 Winter Term 1	Date: 2017/02/17 Contact Person: Dr. Virginie Magnat Phone: 250.807.8441 Email: denise.kenney@ubc.ca
Type of Action: New BA minor in Theatre	
<p>Rationale: The Faculty of Creative and Critical Studies (FCCS) offers a BA in a wide range of programs, a BFA major and minor in Visual Arts, and a BFA major and minor in Interdisciplinary Performance. We are proposing to replace the current Interdisciplinary Performance BFA minor, which requires too many credits of studio work, with a new BA Minor in Theatre similar to that offered at UBC-Vancouver, focusing on the interrelation of theory and practice to better address the interests and needs of students whose primary area of study is in another discipline. Like UBC-Vancouver's BA Minor in Theatre, our proposal combines existing drama-oriented humanities courses delivered by the Department of Critical Studies with existing experiential artistic training offered by the Department of Creative Studies. The creation and delivery of this Minor in Theatre is therefore not contingent on developing new courses, hiring new faculty, or securing additional budgetary resources. While we anticipate this new option to be particularly attractive to students majoring in English, Cultural Studies, Art History and Visual Culture and Creative Writing within the Faculty of Creative and Critical Studies, the Minor is also designed to appeal to students pursuing undergraduate studies in the Social Sciences, Health, Management, and especially Education. It essentially better suits the demographic likely to be interested in a theatre or performance minor. It is therefore not necessary to keep the old BFA minor as both are attracting the same demographic. The BFA Minor in Interdisciplinary Performance will be discontinued once all students currently in that stream have graduated.</p> <p>Whereas the BFA in Interdisciplinary Performance requires students to take Visual Arts and Creative Writing courses in addition to core Performance offerings, hence providing BFA students with intensive studio experience and preparing them for the MFA, the Minor in Theatre will prepare undergraduate students for interdisciplinary graduate studies leading to the MA and</p>	



PhD degrees.

In accordance with the ASPIRE strategic plan, the Minor in Theatre will offer a transformative learning environment to undergraduate students through its interdisciplinary, cross-cultural, and experiential curriculum in theatre, drama, and world performance traditions. Students will learn to critically and creatively explore the plurality of cultural worldviews that currently inform performance research in the humanities, fine arts, and social sciences. They will gain an appreciation of the aesthetic and ritual performance traditions belonging to our shared “intangible cultural heritage” as defined by UNESCO, along with an awareness of the crucial ways in which this cultural heritage informs how we engage with our global community. By familiarizing themselves with global performance cultures, students will learn to respect and cherish diverse ways of being and knowing, including the rich continuum of Indigenous traditional and contemporary performance-based cultural knowledge, which they will be able to explore in the upper-level course “Indigenous Performance Practices” taught by an established professional Indigenous artist. Our goal is to offer undergraduate curriculum that bridges theory and practice as well as traditional disciplinary divides in order to attract students who are both academically inclined and interested in developing their creative potential. Students will gain resilience, resourcefulness, and intercultural awareness by participating in creative projects promoting ethical and sustainable ways of engaging with and contributing to the local community. They will therefore acquire transferrable skills valued on the job market and will be prepared to apply for positions in non-profit cultural organizations, arts- based education, cultural outreach, and community engagement.

Potential Areas/Sectors of Employment for Graduates and/or Opportunities for Further Study

This Minor will prepare students to pursue a wide range of careers that include but are not limited to: Cultural Consultant/Administrator/Curator (theatre festivals, cultural organizations, galleries and museums), Artistic Director, Dramaturge, Theatre Critic, Playwright, Producer, Casting Director, Publicist, Journalist, Arts-based Educator (secondary and post-secondary levels, non- profit community and social service organizations), Educational Programs Coordinator, Cultural Consultant (public and private sectors), Cultural Activist (community engagement, environmentalism, social justice). The Minor in Theatre will also prepare students



for further study in a variety of fields such as: BEd (Drama), MA Counselling/Drama Therapy, MA and Ph.D. in Theatre and Performance Studies, as well as a wide range of graduate degrees in the Humanities and Fine Arts, Social Sciences, Interdisciplinary Studies, Journalism, Law, and International Relations, among others. The Faculty of Education has already confirmed that BA students with a Minor in Theatre entering the 16-month post-degree Bachelor of Education would be able to personalize the BEd program by developing an arts-based focus in Theatre that could significantly enhance their employment opportunities.

Proposed Academic Calendar Entry:

Homepage (draft) Faculties, Schools, and Colleges Faculty of Creative and Critical Studies **Bachelor of Arts Programs**

Bachelor of Arts Programs

Contents

Program Overview
Admission Requirements
Academic Regulations
Degree Requirements
Program Requirements
Art History and Visual Culture
Creative Writing
Cultural Studies
English
French
Medieval and Renaissance Studies (Minor)
Spanish
Theatre (Minor)

Draft Academic Calendar URL:

http://www.calendar.ubc.ca/okanagan/pr_oof/edit/index.cfm?tree=18,283,902,0

Present Academic Calendar Entry:

Bachelor of Arts Programs

Contents

Program Overview
Admission Requirements
Academic Regulations
Degree Requirements
Program Requirements
Art History and Visual Culture
Creative Writing
Cultural Studies
English
French
Medieval and Renaissance Studies (Minor)
Spanish



Minor in Theatre

No formal application for the Minor in Theatre is required and there is no audition process.

To complete a minor in Theatre, students must take at least 30 credits of eligible Creative and Critical Studies courses, including:

- 6 credits in THTR courses at the 100 level, including THTR 111
- 6 credits in THTR courses at the 200 level, including THTR 211
- 9 credits in THTR courses at the 300 and 400 level, including THTR 411
- 9 credits in drama-related courses at the 300 and 400 level must be selected from the following list: ARTH 301, 390, 450, 460; CRWR 310, 473, 474; CULT 300, 305, 315, 320, 400, 401, 410, 490, ENGL 351, 352, 353, 357, 358, 387; FREN 460, 461; JPST 354; THTR 301, 302, 303, 401, 480, 482, 485

EXECUTIVE SUMMARY FOR A NEW DEGREE PROGRAM PROPOSAL Minor in Theatre

FACULTY OF CREATIVE AND CRITICAL STUDIES UNIVERSITY OF BRITISH COLUMBIA, February, 2017

Overview

The Faculty of Creative and Critical Studies (FCCS) offers a BA in a wide range of programs. These are: (1) English major, honours, combined major, and minor; (2) Cultural Studies major, combined major, and minor; (3) Creative Writing major, combined major, and minor; (4) Art History and Visual Culture major, combined major, and minor; (5) Medieval and Renaissance Studies minor; (6) French and Spanish major; (7) French major and minor; (8) Spanish major and minor. The Department of Creative Studies also offers a BFA in Interdisciplinary Performance and a BFA in Visual Arts. What we are proposing is a new Minor in Theatre that will offer a flexible and innovative approach to theatre education and performance studies by drawing from the wealth of existing arts and humanities courses delivered by the various programs in FCCS. The creation and delivery of this Minor is therefore not contingent on developing new courses, hiring new faculty, or securing additional budgetary resources.

In accordance with the ASPIRE strategic plan, the Minor in Theatre will offer a transformative learning environment to undergraduate students through its interdisciplinary, cross-cultural, and experiential curriculum in theatre, drama, and world performance traditions. This Minor will give students the opportunity to combine performance studies, theatre anthropology, cultural studies, world literature, and global art history, as well as studio-based experiential learning focused on experimental, intercultural and collaborative performance practice. By participating in creative projects promoting ethical and sustainable ways of engaging with and contributing to the local community, students will gain resilience, resourcefulness, and intercultural awareness. They will therefore acquire transferrable skills valued on the job market and will be prepared to apply for positions in non-profit cultural organizations, arts-based education, cultural outreach, and community engagement.

While we anticipate this new option to be particularly attractive to students majoring in English, Cultural Studies, Art History and Visual Culture and Creative Writing within the Faculty of Creative and Critical Studies, the Minor is also designed to appeal to students pursuing undergraduate studies in the Social Sciences, Health, Management, and especially Education. The Faculty of Education has confirmed that BA students with a Minor in Theatre entering the 16-month post-degree Bachelor of Education would be able to personalize the BEd program by developing an arts-based focus in Theatre that could significantly enhance their employment opportunities.

Credentials: Minor in Theatre

Location: UBC's Okanagan campus

Faculty Offering Program: The program will be offered in the Faculty of Creative and Critical Studies.

Program Start Date: September 2017.

Program Completion Time: Anticipated time for completion of the Minor is four years.

Objectives

UBC encourages programs in the Faculty of Creative and Critical Studies to constantly refine and update their curricular offerings in keeping with the fast changing pedagogical climate and delivery of course materials. The creation of this Minor will make the most of existing resources in the arts and humanities while giving more options to undergraduate students majoring in a wide range of disciplines. Our goal is to offer undergraduate curriculum that bridges theory and practice as well as traditional disciplinary divides in order to attract students who are both academically inclined and interested in developing their creative potential. By engaging with local, regional, and global performance cultures, students enrolled in this Minor will learn to respect and cherish diverse ways of being and knowing, including the rich continuum of Indigenous traditional and contemporary performance-based cultural knowledge, which they will be able to explore in the upper-level course “Indigenous Performance Practices” taught by an established professional Indigenous artist. This Minor in Theatre therefore supports a greater integration of First Nations learning and teaching approaches. Through its inclusivity of local, regional, and global perspectives, ranging from the study of aesthetic and ritual performance to theories of performativity linked to expressions of identity in contemporary society, we aim to recruit students from diverse social backgrounds and cultural legacies, including Indigenous and international students, as part of the strategic plan outlined by ASPIRE.

The creation of this Minor will entail:

- building upon existing FCCS course offerings that will feed into the requirements for this Minor and capitalize upon the numerous options available in current programs (seven different majors, four combined majors, seven minors);
- adopting/adapting recruitment strategies developed by successful Minors in Theatre at UBC Vancouver, SFU, York, etc., and seeking guidance from colleagues who teach in these programs;
- delivering undergraduate programming that will reflect the interrelatedness of the various fields researched and taught in FCCS, and that will permit students to apply credits taken in a wide variety of courses, thereby enhancing program outcomes and fostering greater interdisciplinary connections across Creative and Critical Studies, as well as across faculties with programs such as Indigenous Studies, Gender and Women’s Studies, Anthropology, Sociology, History, and Philosophy.

The interdisciplinary model for this Minor, which could eventually be developed into a Major, has the potential to expand and diversify UBCO undergraduate programming by opening up possibilities for cross-campus initiatives, including team-teaching, research in practice, living labs, and research hubs spanning the arts, humanities, and social sciences and seeking to make a tangible impact within and beyond the academy.

Contribution to UBC's Mandate and Strategic Plan

The University of British Columbia is a comprehensive research-intensive university, consistently ranked among the 40 best universities in the world. It creates an exceptional learning environment that fosters global citizenship, advances a civil and sustainable society, and supports outstanding research to serve the people of British Columbia, Canada and the world. Since 1915, UBC's West Coast spirit has embraced innovation and challenged the status quo. Its entrepreneurial perspective encourages students, staff and faculty to challenge convention, lead discovery and explore new ways of learning. UBC's Strategic Plan "Place and Promise" identifies three aspects of making UBC one of the world's best universities: preparing students to become exceptional global citizens, promoting the values of a civil and sustainable society, and conducting outstanding research. The proposed expansion of our undergraduate programs will contribute to the realization of each of these goals.

Students enrolled in the Minor in Theatre will learn to critically and creatively explore the plurality of cultural worldviews that currently inform performance research in the humanities, fine arts, and social sciences. They will gain an appreciation of the aesthetic and ritual performance traditions belonging to our shared "intangible cultural heritage" as defined by UNESCO, along with an awareness of the crucial ways in which this cultural heritage informs how we engage with our global community. Cultural diversity, inclusivity, and sustainability are linked to pressing issues of social justice, and students will acquire the skills to engage in and contribute to current theoretical and artistic inquiries; develop their own creative and critical perspectives of performance as embodied, experiential, and practice-based, as well as theoretical, discursive, and political; and explore how cultivating diverse forms of cultural knowledge can help to achieve a sustainable and more just society.

Program Learning Outcomes

Students enrolled in the Minor Theatre will acquire:

- an appreciation of the significance of world performance traditions and practices, and a familiarity with key theatre, performance, and cultural studies theorists as well as influential and emerging artists, cultural practitioners and activists;
- the ability to investigate traditional, modern, and postmodern cultural paradigms, including Indigenous epistemologies, and the skills to apply this knowledge to the description, analysis, and interpretation of contemporary global events;
- a critical understanding of the value of cultural diversity in the age of globalization;
- the analytical and communicative skills necessary to carry out creative and critical research, clearly articulate research findings both orally and in writing, and participate successfully in scholarly and artistic presentations, performances, and interventions;
- an aptitude for representing and expressing effectively the breadth and rigor of their UBCO undergraduate education whether students choose to apply for graduate school or enter the job market.

Linkages Between Program Outcomes and Curriculum Design

Curriculum Design for the Minor in Theatre will prioritize:

- the theoretical and historical contextualization of canonical, alternative, and radical modes of cultural production, including but not limited to literature, drama, theatre, traditional story-telling, performance art, film, painting, sculpture, installation, digital art, new media, as well as decolonizing/indigenizing performance-based activism and cultural revitalization;
- the integration of practice and theory through active participation in performance training and studio work leading to creative projects developed in close collaboration with students enrolled in the Interdisciplinary Performance, Visual Arts, and Creative Writing programs;
- critical engagements with interdisciplinary theoretical perspectives that foreground performativity within socio-cultural processes of identity formation while encompassing a broad spectrum of aesthetic and ritual performance practices and traditions;
- analyses of the performance of social roles as a way of maintaining or disrupting master narratives, supporting or challenging discriminatory practices, confirming or questioning what is considered “natural” or “normal” at the local, provincial, national, and global level;
- examinations of the production of social inequities through institutionalized discriminatory practices leading individuals to believe in and embody identities constructed through such practices;
- investigations of specific strategies that have been/can be developed by individuals and groups to question, resist, and change discourses and behaviors that support discriminatory viewpoints and attitudes.

Potential Areas/Sectors of Employment for Graduates and/or Opportunities for Further Study

This Minor will prepare students to pursue a wide range of careers that include but are not limited to: Cultural Consultant/Administrator/Curator (theatre festivals, cultural organizations, galleries and museums), Artistic Director, Dramaturge, Theatre Critic, Playwright, Producer, Casting Director, Publicist, Journalist, Arts-based Educator (secondary and post-secondary levels, non-profit community and social service organizations), Educational Programs Coordinator, Cultural Consultant (public and private sectors), Cultural Activist (community engagement, environmentalism, social justice). The Minor in Theatre will also prepare students for further study in a variety of fields such as: BEd (Drama), MA Counselling/Drama Therapy, MA and Ph.D. in Theatre and Performance Studies, as well as a wide range of graduate degrees in the Humanities and Fine Arts, Social Sciences, Interdisciplinary Studies, Journalism, Law, and International Relations, among others.

Delivery Methods

The Minor in Theatre will offer coursework combining lectures, seminars, live performances, film screenings, studio-based performance practice, collaborative projects, as well as capstone co-operative experiential learning opportunities in local, regional and international non-profit cultural organizations, theatre companies, arts-based education, cultural outreach, and community engagement.

Program Strengths

Whereas the BFA in Interdisciplinary Performance requires students to take Visual Arts and Creative Writing courses in addition to core Performance offerings, hence providing BFA students with intensive studio experience and preparing them for the MFA, the Minor in Theatre will prepare undergraduate students for interdisciplinary graduate studies leading to the MA and PhD degrees. This new option will replace the current Interdisciplinary Performance BFA minor, which requires too many credits of studio work thereby making it very challenging for students to combine it with their Major. The Minor in Theatre will draw from the multiplicity of humanities courses delivered by the Department of Critical Studies, as well as from the student-centered, experiential artistic training offered by the Department of Creative Studies, ranging from process-oriented creative research to the conception, development, and public presentation of theatre productions. This Minor will therefore combine specificity of focus with interdisciplinary scope to provide a flexible degree enabling students to benefit from faculty-wide undergraduate course offerings while making sensible choices based on a clear menu of options. No additional budgetary resources will be required to make this Minor available to UBCO students.

Overview of the Level of Support and Recognition from Other Post-Secondary Institutions

Not applicable (UBC Vancouver currently offers a Bachelor of Arts with a Major and Minor in Theatre).

Related Programs at UBC of Other BC Post-Secondary Institutions

This Minor in Theatre is structured similarly to its equivalent at UBC Vancouver while offering unique educational opportunities grounded in the disciplinary areas and research strengths that are specific to the UBCO Faculty of Creative and Critical Studies.

Contact Information

Dr. Virginie Magnat, Associate Professor,
Faculty of Creative and Critical Studies,
University of British Columbia's Okanagan Campus
Email: virginie.magnat@ubc.ca
Phone: 250-807-8441



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Curriculum Proposal Form New/Change to Course/Program – Okanagan Campus

Category: 1	
Faculty/School: FCCS Dept./Unit: Creative and Critical Studies Faculty/School Approval Date: 2017/02/21 Effective Session: 2018 Winter Term 1	Date: 2017/01/31 Contact Person: Denise Kenney Phone: 250.864-3974 Email: denise.kenney@ubc.ca
Type of Action: Discontinue the current Interdisciplinary Performance BFA minor.	
Rationale: We are proposing to replace the current Interdisciplinary Performance BFA minor with a new interdisciplinary BA Minor in Theatre that will offer a more theoretical and less practice-based approach to theatre education and performance studies by drawing from the wealth of existing arts and humanities courses delivered by the various programs in FCCS. We believe this option will be more attractive to students majoring in English, Cultural Studies, Art History and Visual Culture and Creative Writing. It is also designed to appeal to students pursuing undergraduate studies in the Social Sciences, Education, Health, and Management. It essentially better suits the demographic likely to be interested in a theatre or performance minor. It is therefore not necessary to keep the old BFA minor as both are attracting the same demographic. Please refer to accompanying proposal for details regarding the new BA Minor in Theatre.	
<i>The requirements for this Minor will be deleted from the Academic Calendar only after all students registered for the Minor have completed the requirements.</i>	



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Proposed Academic Calendar Entry:	Current Calendar Entry:
<p>Minor in Interdisciplinary Performance</p> <p><u>Admission to this minor is suspended as of September 2017. Students interested in completing a minor in Theatre should consult the BA minor in Theatre.</u></p> <p>To complete a Minor in Interdisciplinary Performance, students must accumulate no fewer than 36 credits in Theatre.</p> <p>Students must complete the following courses:</p> <p>First Year</p> <p>6 credits from: THTR 101, 102, 103 THTR 111 Introduction to Theatre and World Performance VISA 090 Safety Training</p> <p>Second Year</p> <p>9 credits from: THTR 201, 202, 211, 280</p> <p>Third and Fourth Years</p> <p>THTR 301 Acting III: Performance Styles THTR 401 Live Art/New Media THTR 411 Performance Studies THTR 480 Special Topics in Performance Creation THTR 482 Advanced Performance Practices I</p> <p>Whenever possible, students are encouraged to take courses in Visual Arts, Creative Writing, and Creative and Critical Studies courses in addition to these Theatre requirements.</p>	<p>http://www.calendar.ubc.ca/okanagan/index.cfm?tree=18,283,833,1290</p> <p>Minor in Interdisciplinary Performance</p> <p>To complete a Minor in Interdisciplinary Performance, students must accumulate no fewer than 36 credits in Theatre.</p> <p>Students must complete the following courses:</p> <p>First Year</p> <p>6 credits from: THTR 101, 102, 103 THTR 111 Introduction to Theatre and World Performance VISA 090 Safety Training</p> <p>Second Year</p> <p>9 credits from: THTR 201, 202, 211, 280</p> <p>Third and Fourth Years</p> <p>THTR 301 Acting III: Performance Styles THTR 401 Live Art/New Media THTR 411 Performance Studies THTR 480 Special Topics in Performance Creation THTR 482 Advanced Performance Practices I</p> <p>Whenever possible, students are encouraged to take courses in Visual Arts, Creative Writing, and Creative and Critical Studies courses in addition to these Theatre requirements.</p>

Commented [RA1]: Live link to new BA minor in Theatre



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18 May 2017

To: Senate

From: Learning and Research Committee

RE: Candidates for Emeritus Status (approval)

The Learning and Research Committee recommends approval of the following motion:

Motion: *That the attached list of individuals for emeritus status be approved and that, pursuant to section 9(2) of the University Act, that they be added to the Roll of Convocation.*

Respectfully submitted,

Dr. Peter Arthur, Chair
Senate Learning and Research Committee

Emeritus Status Effective July 1, 2017				
Name	Job Title	Fclty Name	Service Date	Effective Ret/Res Date
Ding, Yijiang	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-03-99	July-01-17
Dods, R Robin	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-05-86	July-01-17
French, Diana	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	July-01-05	July-01-17
Gattrell, Janice	General Librarian (confirmed)	UBCO-Provost&VPncplAcadm	October-20-90	July-01-17
Peacock, Sandra	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-07-01	July-01-17
Pearson, Gary	Assoc Professor (tenure)	UBCO-Fac.of Creat&Crit.Studies	August-01-91	July-01-17
Russell, Peter	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-04-92	July-01-17
Scarff, Carol	Assoc Professor (tenure)	UBCO - Faculty of Education	August-06-02	July-01-17
Stuart, Francis Ian	Professor (tenure)	UBCO - Faculty of Management	August-01-07	July-01-17
Vaisius, Allan	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-16-00	July-01-17

Emeritus Status Effective July 1, 2017				
Name	Job Title	Fclty Name	Service Date	Effective Ret/Res Date
Ding, Yijiang	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-03-99	July-01-17
Dods, R Robin	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-05-86	July-01-17
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Peacock, Sandra	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-07-01	July-01-17
Pearson, Gary	Assoc Professor (tenure)	UBCO-Fac.of Creat&Crit.Studies	August-01-91	July-01-17
Russell, Peter	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-04-92	July-01-17
Scarff, Carol	Assoc Professor (tenure)	UBCO - Faculty of Education	August-06-02	July-01-17
Stuart, Francis Ian	Professor (tenure)	UBCO - Faculty of Management	August-01-07	July-01-17
Vaisius, Allan	Assoc Professor (tenure)	UBCO-BarberSchoolArts&Sciences	August-16-00	July-01-17



8 May 2017

To: Okanagan Senate

From: Nominating Committee

Re: A) Adjustments to Committee and Council Assignments

B) Election of a Vice-Chair of Senate

C) Triennial Review

D) President's Advisory Committee for the Selection of a Vice-President Human Resources

Adjustments to Committee and Council Assignments

The Senate Nominating Committee has yet to receive suggestions from the Student Caucus on Committee assignments. To ensure student representation in the work of Senate, the Nominating Committee is recommending that students be assigned to committees on an alphabetical basis, with such variations as required for eligibility reasons, until such time as the students recommend otherwise:

That Mr Arash Aghshahi, Ms Kelsey DesRoches, and Ms Megan Harper be appointed to the Academic Policy Committee until 31 March 2018 and thereafter until replaced;

That Mr Daniel Kandie and Mr Kyle Lee be appointed to the Admissions & Awards Committee until 31 March 2018 and thereafter until replaced;

That Ms Emily Lewis and Ms Kelly Lu be appointed to the Agenda Committee until 31 March 2018 and thereafter until replaced;

That Ms May Ly, Ms Brittini MacKenzie-Dale, and Ms Kristen Morgan be appointed to the Appeals on Standing & Discipline Committee until 31 March 2018 and thereafter until replaced;

That Ms Hillary Tjioe and Ms Janessa Tom be appointed to the Curriculum Committee until 31 March 2018 and thereafter until replaced;

That Mr Arash Aghshahi and Ms Megan Harper be appointed to the Learning & Research Committee until 31 March 2018 and thereafter until replaced;



That Ms Kelsey DesRoches and Mr Daniel Kandie be appointed to the Council Budget Committee until 31 March 2018 and thereafter until replaced;

That Mr Kyle Lee be appointed to the Council Elections Committee until 31 March 2018 and thereafter until replaced;

That Ms Emily Lewis be appointed to the Council of Senates Representative Committee Five until 31 March 2018 and thereafter until replaced; and

That Ms Kelly Lu and Ms May Ly be elected to the Council of Senates.

Election of a Vice-Chair of Senate

Under the *University Act*, the Senate is required to elect a vice-chair at least annually, with the provision that no person may serve more than two consecutive years as vice-chair. In the *Rules and Procedures of Senate*, it is assumed that the Academic Vice-President for the Okanagan campus will stand for election as vice-chair from September to May; however, another person must serve a term in between that period from time to time to comply with the *Act*. After much careful deliberation and consideration of her prior outstanding service as a Vice-Chair of Senate over the summer months where Senate does not regularly meet, the Senate Nominating Committee is pleased to recommend:

That Dr Cynthia Mathieson be elected Vice-Chair of Senate from 19 May 2017 to 31 August 2017 and thereafter until replaced.

Triennial Review

The Senate Nominating Committee has met to consider feedback and suggestions from Senate Committees and others regarding the operations of Senate and its Committees. Those suggestions regarding the operations and rules of Senate itself have been passed on to the Senate Agenda Committee, and those suggestions regarding the Council of Senates and its committees will be brought to the attention of the Council Executive Committee. For the Committees of Senate, the Senate Nominating Committee has changes to recommend to two: the Admissions & Awards Committee, and the Appeals on Standing & Discipline Committee.

The Admission & Awards Committee has requested that a lower quorum be set for the consideration of applicant and student appeals: 3 members. Traditionally, appeals are heard during the summer months when few members are present. A lower quorum would allow applicants to receive a final decision from UBC in a timelier manner. The existing quorum of 6 members would be retained for all other business before the committee.



For the Appeals on Standing & Discipline Committee, similar quorum issues are evident. After consideration, the Senate Nominating Committee agrees that a lower quorum would facilitate the expedient consideration of appeals; however, the Committee feels that a lower quorum must be set in such a way as to ensure that matters are heard by both faculty and student senators. Therefore, the committee is recommending that a quorum be reduced from 4 to 3. The Committee presently has 5 faculty members, 3 students and 1 convocation member.

The Senate Nominating Committee is therefore pleased to recommend:

That Senate amend the quorum for the Senate Admissions and Awards Committee as follows: 6 voting members, except when hearing appeals, where 3 voting members shall constitute a quorum; and

That Senate amend the quorum for the Senate Committee on Appeals of Standing & Discipline as follows: 3 voting members, at least one of whom must be a faculty member, and one of whom must be a student.

President's Advisory Committee for the Selection of a Vice-President Human Resources

The Senate Nominating Committee has received a request from the Office of the President for Senate to appoint a faculty member from the Okanagan campus to a search committee for UBC's next Vice-President Human Resources. The Committee resolved to put out a call for nominations from all faculty members, and to give the community time to respond, nominations have been set as due the day before the Senate meeting. The Nominating Committee will meet prior to Senate to decide on a recommendation to fill in the following blank:

That Senate appoint _____ to a President's Advisory Committee for the Selection of a Vice-President Human Resources.

Respectfully submitted,

Dr Daniel Keyes, Chair
Senate Nominating Committee

18 May 2017



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

Okanagan Senate

Docket Page 245 of 387
Provost and Vice Principal Academic
Okanagan Campus
ADM 119, 1138 Alumni Ave
Kelowna, BC Canada V1V 1V7

Phone 250 807 8139
Fax 250 807 8537
<mailto:ubco.provost@ubc.ca>

May 1, 2017

To: Senate, UBC Okanagan

To the attention of:

Christopher Eaton, Associate Registrar for Academic Governance
and Director of Senate and Curriculum Services

From: Cynthia Mathieson

A handwritten signature in cursive script that reads 'Cynthia Mathieson'.

Provost and Vice-President Academic

Re: **Report to Senate on External Reviews of Academic Units, 2015-16**

Item for Information:

In accordance with Senate policy I am pleased to forward the Annual Report on External Reviews of Academic Units and Programs, for information. This report covers the period of September 2015 through August 2016. It provides a summary of each of the two external reviews undertaken.

Attachment: Report to Senate on External Academic Reviews, 2015-2016

Report to Senate
External Reviews of Academic Units and Programs at UBC Okanagan
2015 – 2016
April-26, 2017

Submitted by: Dr. Patricia Lasserre, Associate Provost, Enrolment and Academic Programs

External reviews were conducted on the following academic units and programs at UBC Okanagan between September 1, 2015 and August 31, 2016. Key findings and recommendations made by the reviewer teams, along with the Faculty and/or Department responses, are highlighted on the following pages and comprise the remainder of this report.

	<u>Page</u>
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❖ School of Engineering – November 2015	2
<u>College of Graduate Studies</u>	
❖ College Review – February 2016	5

**School of Engineering
Faculty of Applied Science**
Summary of External Review: November 2015

Highlights and Key Findings:

- The School of Engineering (SoE) has grown to be one of the strongest faculties at UBC-O.
- There is potential for further growth in terms of new programs and the number of students and there is evidence of strong student demand for the SoE programs.
- The faculty and staff are highly energetic, committed and collegial, working together to address issues.
- The design team approach and communication skills of the students adopted within the undergrad program, along with “hands on” capabilities of the students, is considered highly beneficial by the professional sector, which bodes well for significant job opportunities for the SoE graduates both now, and into the future.

Key recommendations and Unit's Response:

- Recommendation: think strategically as to whether the School of Engineering needs to further grow.

Unit's Response: The School of Engineering views the growth of the School as an opportunity. It has developed a growth model guided by the following principles: 1) a 23:1 student to faculty ratio, 2) incremental growth over a 10 year period to allow for resourcing prior to implementation, 3) a 3:1 domestic to international student ratio, 4) maintaining a pedagogically strong learning environment with “design from the start,” (5) project and team-based learning, and, 6) continued accessibility to faculty and staff through an open door policy. In the next five years, the School will introduce three new programs and additional minors. This will lead to an increase in the number of undergraduate, graduate and international students, the number of faculty members as well as an increase in research funding. The implementation strategy includes a comprehensive space utilization plan to optimize class schedules; a task force has been established to prepare recommendations for this plan. Thus far, the task force has recommended that all first and second year classes be split into two sections. This adjustment will provide two benefits: maintain the intimate learning environment and allow for better access to classrooms. The School will ensure that students continue to receive appropriate support to develop their core competencies and succeed in their studies and careers.

Update from Associate Dean Rehan Sadiq: The School of Engineering has Minors in ‘Management’ and ‘Computer Science’. The three new program offerings under development include: Biomedical Engineering, Software Engineering, and DME. The School is also introducing a Mechatronics Option.

- Recommendation: consider the long term risk of the movement of experienced instructors to upper level teaching, removing teaching expertise from lower level courses.

Unit's Response: The number of first time instructors is not unusual for a new School, and the School has responded to this need by being highly selective with all of its sessional hires. The School has made significant inroads into the professional community in Kelowna and has successfully recruited industry professionals for more than half of the courses delivered by sessional lecturers. The School is equally selective when hiring graduate students to teach courses. All have passed their candidacy exams and have been recognized for excellence in teaching by the University. Many have received Teaching Assistantship awards.

- Recommendation: Increase the number of grad courses available.

Unit's Response: The School experimented with delivering graduate courses via video link in the past. It was not all together successful; however, we will explore the practicality of this option again. As the School continues to hire more faculty, we plan to grow the number of graduate courses we offer.

Update from Associate Dean Rehan Sadiq: The School has not explored the practicality of offering video link courses offered by the Vancouver campus.

- Recommendation: consider female/male ratio, CRC allocation and teaching/research needs in future hiring.

Unit's Response: The School of Engineering accepts the Reviewers' recommendations and will include these in the Faculty Recruitment Hiring Plan. Meeting the School's educational needs, and the need to increase gender equity will be important principles guiding future hiring. To ensure the School meets its teaching needs, the School plans to hire four 12-Month Lecturers this spring in readiness for the next Winter Session.

Update from Associate Dean Rehan Sadiq: The School only hired two 12 Month Lecturers for two consecutive years, not four as stated in the response.

- Recommendation: undergraduate courses should be taught by faculty with the pertinent skillset.

Unit's Response: The School agrees with the Reviewers' recommendation, and intend to initiate discussions with the Heads of Math and Computer Science regarding joint appointments.

Update from Associate Dean Rehan Sadiq: The School discussions with the Department of Computer Science, Math, Physics and Statistics have resulted in a Minor in Computer Science. Discussions are also underway regarding a new Software Engineering program, and if successful may result in joint faculty appointments.

- Recommendation: improve coordination with partner institutions in recruitment and advising of transfer students to UBC O.

Unit's Response: The School has been working closely with its eight University College transfer programs to develop a smoother transfer credit process. Earlier this fall, the School's academic advisor met with interested students and peer advisors at Thompson Rivers University, College of New Caledonia and Selkirk College. The purpose of those visits was to present the details of the transfer process and articulation agreements to prospective students and their colleges' academic advisors.

- Recommendation: develop stronger connections between industry, alumni, and the engineering faculty.

Unit's Response: The School of Engineering will be recruiting a 'Development Liaison' position in partnership with the Development Office. The successful candidate will support alumni relations and enhance industry relations. The School expects to fill this position March 2016.

- Recommendation: create more opportunities for mentoring junior faculty members.

Unit's Response: All new faculty are invited, by UBC Okanagan Human Resources department, to participate in their mentorship program. The Associate Dean of the School is a member of this program and few of our faculty members have registered as mentees. Moreover, the Director of the School formally meets with faculty members annually to discuss their career progress, and to provide support and feedback. The School and the Faculty of Applied Science also established a \$50,000 intercampus research collaboration fund to encourage research collaboration between the two campuses.

- Recommendation: establish a minimum recommended compensation for Masters and PhD students

Unit's Response: The School is not in favour of establishing minimum funding requirements. The average funding for PhD students is \$21,954 and \$18,120 for Masters Students. This level of funding is commensurate with universities of similar size across Canada. The School allocated \$100K for graduate student scholarships this year. This funding support is expected to continue and the School intends to increase this amount in future years.

Other recommendations touches on the on-going need to support new faculty through start-up funds, mentoring, clear articulation of expectations, the need to support graduate students (minimum funding, standardization of directed study courses), improve lab access for undergrad students, as well as better communications for clarity and transparency on roles, processes and procedures.

College of Graduate Studies

Summary of External Review: November 2015

Highlights and Key Findings:

The report recognizes the significant advances in the regulations, structures and processes that were developed over the past five year despite the remarkably rapid growth over the past decade. However, the report concludes that the trajectory of graduate enrolment growth has outpaced the development of appropriate courses, services, and quality control measures. The report notes in particular:

- There is a lack of strategic plan to guide the growth;
- The necessary administrative support is not always available in some programs;
- There are a limited number of graduate courses;
- Regulations, policies and process are not always communicated clearly, or adhered to consistently;
- There is a lack of adequate and consistent funding for graduate students;
- The IGS program lacks clarity of purpose;

Key recommendations

- Recommendation: Define membership in the College with both approval and review/removal processes.

Dean's Response: Although procedures around the administration of Membership in the College of Graduate Studies (and thus supervisory privilege) were articulated in Senate Policy O-4, there is no evidence of adherence to these procedures since the inception of O-4 in 2010. Senate Policy O-4 is currently under revision and will be brought forward for discussion and approval to Graduate Council and Senate during Winter Term II, 2017 (note: parts have been discussed at Graduate Council to date). Drastically revised procedures and criteria around membership, review of membership, and revocation of membership will be a critical component of the overall revision. I agree wholeheartedly with the Reviewers' recommendation. We cannot aspire to excellence in graduate supervision and education without the establishment of, and adherence to, rigorous standards of Membership in the College.

- Recommendation: Create a graduate academic calendar for UBC-O.

Dean's Response I agree that we need a separate on-line graduate calendar. Indeed, most graduate students are unaware that there are graduate studies sections embedded in the current undergraduate calendar. Since we are currently revising our website such that all three handbooks (the Graduate Student Handbook, the Graduate Program Coordinators Handbook, and the Handbook of Supervision and Examination) will be rewritten into one searchable document, we would work with the Senate office to determine the parameters and linkages needed between a graduate calendar and the CoGS website.

- Recommendation: Revise the admission process so that CoGS provides only final approval based on program recommendations.

Dean's Response I could not agree more. The past admission process has been unnecessarily labour intensive. The workflow analysis, which was carried out by Dr. Jenny Phelps, Assistant Dean in FoGS this past summer, also made this recommendation. The new CoGS streamlined admissions process, which is now in place for the current admissions period for September 2017 admissions, was introduced to Graduate Council on November 16, 2016. CoGS office staff will offer frequent training sessions over the

next few months to facilitate this process and we look forward to supporting graduate programs with respect to more competitive, timely admissions offers.

- Recommendation: Introduce policy for minimum funding for the expected duration of the program .

Dean's Response This recommendation has my strongest support. However, I wish to be exceedingly clear that responsibility for the funding of thesis/ research based graduate students is a shared responsibility across all areas of campus: centrally, at the Faculty/School level, at the Graduate Program level, and with CoGS support.

Currently only three graduate programs (Biology, Chemistry, and Biochemistry and Molecular Biology (BIMB)) support their PhD students at the Tri-Council level.

- *Lack of commitment to funding increases times to completion and stress levels for graduate students and also erodes the graduate experience and the university's reputation.*
- *We need to have this conversation across campus. If we cannot 'afford' to support PhD students at the Tri-Council level (through packages which include TAs, RAships, AAships, Internal CoGS awards and external scholarships), then we should not admit as many PhD students. Graduate students are not here as sources of cheap labour nor are they here to facilitate tenure and promotion of faculty members at the expense of the integrity of graduate education, including adequate graduate student support.*
- *Many of our competitors offer guaranteed multi-year funding packages which range from \$25,000-\$35,000 or above for doctoral students*
- *As of Winter Term II, 2016, only 12% of our doctoral students held external funding (including Tri-Council) and while average funding levels per student came in just below \$16,000, a full 21% of doctoral students were unfunded from ANY source (PAIR data)*
- *In contrast, on the UBCV campus (2014-2015) data reveal averages by discipline for PhD (yr 1-4) which range from \$26,258 for Professional (non-health) to \$33,173 for Social Sciences, with an overall average of \$29,564; 25% held some type of external award.*

- Recommendation: The IGS program should focus exclusively on interdisciplinary studies

Dean's Response The new proposed IGS refit will not allow disciplinary study to hide under its umbrella. Dr. Thomas Heilke, Associate Dean in CoGS, and our IGS Transformation team have all worked tremendously hard to craft a well-defined IGS program which will be solely based on Interdisciplinary Themes. I support this and look forward to bringing it through the Senate consultation and approval process. CoGS will also work with any graduate programs which feel that they have the resources and depth and breadth of expertise to propose a stand-alone disciplinary graduate program.

- Recommendation: There should be a consistent set of graduate course offerings for all graduate programs

Dean's Response These are excellent suggestions. The new IGS addresses these issues and will encompass a core graduate course and other graduate courses developed within themes and supported by faculty Deans. The new IGS also eliminates past heavy over-reliance on directed studies courses offered off the 'sides of desks', with the supervisor sometimes delivering two or three courses to the same student.


Other recommendations relate to the governance and structure of the College, its support structure and staffing, the services for graduate students and post-doctoral fellows, as well as the role of graduate students' supervision in the promotion and tenure criteria.

**a place of mind****THE UNIVERSITY OF BRITISH COLUMBIA**

Office of the Provost & Vice-Principal Academic

MEMORANDUM

Date: May 5, 2017
To: Okanagan Senate
From: Cynthia Mathieson, Provost and Vice Principal
Re: Annual Report of Research Institutes



Pursuant to Senate Policy O-5, please find attached the annual reports of the Research Institutes on the Okanagan campus and a summary of their activities prepared by the Vice-Principal Research, Dr. Phil Barker.

These reports and summary will be presented to Senate by Dr. Barker for information only pursuant to Policy O-5.



May 5, 2017

To: Okanagan Senate

From: Dr. Philip Barker, Vice-Principal Research

Re: Annual Reports of Research Institutes

I am pleased to provide the Annual Reports of Research Institutes to the Okanagan Senate. Summaries of yearly activities of each of our Institutes are provided below.

Institute for Community Engaged Research (ICER)

Director: Dr. Jon Corbett

The Institute for Community Engaged Research had a busy year, having secured more than \$2.9M in new grants and contracts, authored and co-authored over 30 peer-reviewed articles, and supervised 44 Masters and 45 PhD students. ICER fostered strong partnerships with 31 community organizations and other research institutes, including the Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) and the Regional Socio-Economic Development Institute of Canada (RSEDIC). The Institute hosted 7 speakers at well-attended events, including the "Starting a Conversation" Series, the *Okanagan Research Forum* (alongside BRAES), and the *Indigenous Languages Fluency Symposium* (in partnership with the En'owkin Centre). In this past year, ICER has launched a new scholarship initiative, offering two \$1000 scholarships to students involved in community engaged research.

Institute for Healthy Living and Chronic Disease Prevention (IHLCDP)

Director: Dr. Joan Bottorff

The Institute for Healthy Living and Chronic Disease Prevention has had a successful year. They hosted or co-hosted 38 events that drew more than 1600 attendees. Institute investigators received more than \$2.3M million in externally funded research grants over the 2016-2017 term and the Institute has built strong partnerships with a number of community-based organizations such as with Bridge Youth and Family Services, Interior Savings Credit Union, Canadian Institute for the Relief of Pain and Disability, and Propel Centre for Population Health Impact. One of their most popular events this year was the 4th *Annual Okanagan Embrace Aging Month*, which was co-hosted by Interior Health and Interior Savings Credit Union in March 2017. The event included more than 20 educational opportunities, and attendance increased 51% compared to the previous year. Finally, the IHLCDP welcomed two visiting scholars to our campus this year: Dr. Kate Hunt from the University of Glasgow, and Dr. Uba Backonja from the University of Washington, Tacoma.



Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES)

Director: Dr. Lael Parrott

The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services had another outstanding year, with more than 80 events hosted. These included forums, guest speakers, workshops and a variety of social networking events. The Institute streamed 23 presentations from UBC Vancouver to the Okanagan campus, and two live presentations in Kelowna were likewise streamed into the Beaty Auditorium in Vancouver. BRAES was proud to co-host this year's *Okanagan Research Forum* with Institute for Community Engaged Research, presenting on the theme "Building a Resilient Okanagan Community." Finally, Two BRAES students represented our campus in the summer of 2016 at the World Student Environmental Global Summit that was held in the United Kingdom.

Regional Socio-Economic Development Institute of Canada (RSEDIC)

Director: Dr. Roger Sugden

Over the 2016-2017 year, the Regional Socio-Economic Development Institute of Canada has continued to strive for excellence in research both locally and internationally. RSEDIC's primary purposes are to impact regional economies, and offer unique training opportunities to faculty members and UBC Okanagan graduate students. The Institute focuses on three major research initiatives: positioning the BC Wine Industry for international growth in partnership with the KEDGE Business School in Bordeaux, France; studying occupational structure in the Okanagan Nation Territory, which is a cross-campus and inter-university research project; and socio-technical change and regional economic development which resulted in partnership discussions with the German Aerospace Centre and the Technical University of Delft.



INSTITUTE FOR
COMMUNITY
ENGAGED RESEARCH



INSTITUTE FOR COMMUNITY ENGAGED
RESEARCH - ICER

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Highlights 2016-2017

ICER connects researchers from a range of disciplinary backgrounds who share a commitment to research that supports diversity, equity, and social justice. The Institute facilitates the participation of community members, organizations, students, and academics in undertaking effective research. It is a hub for building relationships, collaboration, and effective knowledge creation and exchange. This past year, ICER has been highly successful in achieving these goals.

ACADEMIC MEASURES

In the 2016-2017 reporting period ICER members¹:

- Secured **\$2,954,702** in new grants and contracts, and manages a further **\$1,899,413** in ongoing grants and contracts.
- Authored and coauthored over 30 peer-reviewed articles
- Supervise 44 Masters and 45 Ph.D. Students.
- Graduated 13 Masters and 6 Ph.D. supervised students.

ACTIVITIES and PROJECTS

In the 2016-2017 reporting period ICER members:

- Hosted the Okanagan Research Forum with The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES), BC Wildlife Federation and Okanagan Nation Alliance with over 100 participants
- Hosted the Indigenous Languages Fluency Symposium in partnership with the En'owkin Centre and the support of the Indigenous Language Fluency Degree Consortium over three days with over 130 participants
- Obtained funding to develop the UBC Okanagan Research Portal with RSEDIC and Innovation Library
- Collaborated with the En'owkin Centre to develop Reconciliation Training materials and processes for City of Kelowna
- Consolidated the Starting a Conversation series with 7 speakers from September 2016 – March 2017
- Created the ICER Scholarship Program for UBC Okanagan Graduate Students

¹ Please note 18/32 members provided their reporting materials and 2/32 were on leave.

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OUTREACH and COMMUNICATION

- Partnered with more than 31 community organizations and other research institutes
- Hosted events that have been attended by more than 1000 participants
- Received considerable media attention through events such as the Okanagan Research Forum and Homeless Mapping Research Project
- Enhanced UBC Okanagan's visibility and reputation locally and internationally

REVIEWING STRATEGIC GOALS 2016-2017

- Form an editorial board for ICER press (completed)
- Foster relationships with the community at large to facilitate opportunities to address social issues through research and knowledge mobilization opportunities (ongoing)
- Develop relationship with Student Learning Services around community research opportunities (considerable effort resulting in actively supporting nascent city studio program)
- Work with the UBC Okanagan Development office to pursue other funding opportunities (assistance with Central Okanagan Foundation grant, ongoing)
- Continue to pursue excellence in Community Engaged Research

LOOKING AHEAD TO 2017-2018

- Our newly formed editorial board will develop editorial policies for ICER press,
- We will carry on fostering and supporting relationships with the community - the portal project will provide opportunities to support this initiative,
- We will further consolidate the relationship with Student Learning Services – this will be partially achieved through our co-initiative with the City Studio program,
- We will work with the UBC Okanagan Development office to pursue other funding opportunities - in pursuant of additional funds to support specific programs such as the ICER Scholarship, and
- We will continue to pursue excellence in Community Engaged Research and growing the Institute to include, represent and support researchers and community partners working in our field of research.

I was excited to have been given the opportunity to take on the role of director for ICER in August 2016. Over the past year, we have remained along Mike Evans's (ICER's first director) path to establishing a clear and meaningful role for the Institute on our Okanagan campus and within the wider community. We have continued to nurture worthwhile relationships with other UBC Okanagan institutes and departments who work in the realm of community engaged research. We

ICER ANNUAL REPORT 2016-2017

also continue to reach out and partner with a growing number of community organizations, including the Central Okanagan Foundation, the Okanagan Regional Library and Interior Health.

ICER researchers work in communities around the globe. They maintain active affiliations with many partner organizations. We have sustained our commitment to strong research partnerships that supports knowledge creation and exchange that promotes equality, equity, and justice at the local, national, and international levels. As this Annual Report demonstrates, these broad objectives are clearly represented in the activities that ICER has initiated, supported and facilitated over the past year.



Jon Corbett
Director of the Institute for Community Engaged Research
May 1, 2017

ICER respectfully acknowledges the Syilx Okanagan Nation and their peoples, in whose territory we live and work.

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Academic Measures

The scope of practice among ICER's membership includes teaching, research, and the integration of both into community engaged relationships. We are committed to:

- Conducting cutting-edge research in our identified research themes,
- Providing world-class training opportunities for graduate, postdoctoral and community researchers,
- Offering substantial opportunities for undergraduate research experience, and
- Fostering a vibrant local community of researchers from within and beyond the University, and facilitating linkages into a wider community of international scholars and scholarship.

Faculty and associate members of ICER conduct research across a very broad range of disciplines and employ any number of methods and methodologies in their research. As an Institute, we are committed to being flexible and responsive to community priorities and interests as well as those of university members. Our research focus, beyond research that engages and contributes to solutions and positive outcomes for communities, is necessarily open-ended. Nonetheless, we and our community partners have developed five "research clusters" that frame the research undertaken within the ICER. These clusters include community, faculty, and student participants working on related projects. The intention of the clusters is to provide clarity around our research interests and strengths, and to define smaller more focused communities of practice within the wider Institute.



ICER ANNUAL REPORT 2016-2017

GRANTS

This year ICER members² secured **\$2,954,702** in new grants and contracts, and a further **\$1,899,413** in ongoing grants and contracts.

ICER New Grants 2016-17 (please note that ICER members are in bold text):

	Funder	Title	Amount	Primary Investigator	Co-Investigator	Collaborator
1	South Okanagan Similkameen Research Foundation and Mitacs	Understanding collaborative community based mental health services	\$17,456	Nelly Oelke (PI)	Corbett (co-applicant)	
2	Mitacs/Real Estate Foundation/Mitsubishi Foundation	A collaborative web-based decision-support tool for First Nations	\$50,000	Jon Corbett		
3	Social Sciences and Humanities Research Council	Open data policies in British Columbia	\$138,500	Ian Parfitt (PI)	Corbett (co-applicant)	
4	Canadian Wildlife Federation	Android reporting tool	\$20,000	Jon Corbett		
5	I.K.Barber Learning Fund/ Office of the Vice Principal/ IKBSAS	Community Engagement Portal	\$27,000	Jon Corbett		
6	SSHRC		\$20,916			Bonar Buffam
7	Grants for Catalyzing Research Clusters		\$10,163			Bonar Buffam
8	Bridge Funding		\$3,000	Bonar Buffam		

² Please note 18/32 members provided their reporting materials and 2/32 were on leave.

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9	CIHR PHSI Development	Eliciting public values to inform cancer drug decision-making across Canada	25,000 (with a \$5,250 funding top up by the UBC VPR)	S Peacock	J Abelson, M Burgess	
10	CIHR	Filling the void: Public engagement around a new model for access to research resources.	\$113,500	K McGrail	M Burgess , K O'Doherty, N Meagher, S Vercauteren	
11	CIHR	Public deliberation on vaccine hesitancy.	\$100,000	K Odoherty	M Burgess , T Caulfield; E. Christofides ; N. Crowcroft; M. Goldenberg; CM McMurtry; M Pettit; DJ Willison	
12	CPAC	Development of a pan-Canadian framework of public values and priorities for integration into cancer drug funding decision making	\$800,000	S Peacock	J Abelson, M Burgess	
13	SSHRC IG	Water Ways	\$297,000	Aleksandra Dulic		

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14	Central Okanagan Foundation Canada 150th	Music of Heaven Workshop	\$12,000	Aleksandra Dulic		
15	TELUS	Right of Way – Wildlife corridors and Ecological Connectivity in the Okanagan	\$18,000	Aleksandra Dulic		
16	MITACS	Social Life of Water	\$15,000	Aleksandra Dulic		
17	Okanagan Basin Water Board	Social Life of Water	\$13,300	Aleksandra Dulic		
18	SSHRC connection grant	The Future Delta 2.0 experience: Mobilizing knowledge on climate change education through video games 37K; 2.	\$37,000	Aleksandra Dulic		
19	BC Museum Association grant British Columbia Canada 150	Sharing Our History to develop infrastructure for Social Life of Water touring	\$15,000	Aleksandra Dulic, Co applicant		
20	Rotary Centre for the Arts	Music of Heavens	\$6,700	Aleksandra Dulic, Co applicant		
21	Kelowna Museum	Music of Heavens	\$2,000	Aleksandra Dulic, Co applicant		
22		Social mobilization on climate change using digital tools.”	\$50,000	Aleksandra Dulic, Co applicant		

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23	SSHRC Knowledge Synthesis Grant	Evaluation approaches for community change initiatives to address Aboriginal child and family well-being.	\$25,000 (with a \$5,250 funding top up by the UBC VPR)	Judy Gillespie	Jason Albert, First Nations University	
24	MITACS	Framework for dialogue and learning with parents and professionals in the Central Okanagan	\$15,000	Judy Gillespie	Menno Salverda (PhD Student)	
25	VP Research UBC Grants for Catalyzing Research Clusters	Remembering and commemorating trauma	\$11,000	Le Normand, B. (History, UBCO) & Tamez, M. (Indigenous Studies, UBCO) Buffam, B. (Sociology, IKBAS, UBCO), Chau, S. (Social Work, FHSD, UBCO), Hargreaves, A. (English, FCCS, UBCO), Higgs, C. (History, IKBAS, UBCO), Magnat, V. (Performan		

ICER ANNUAL REPORT 2016-2017

				ce, FCCS, UBCO), Porter, S. (Psychology, IKBAS, UBCO), Ungureanu, M. (Philosophy, IKBAS, UBCO)		
26	Vancouver Foundation	Sexual health knowledge: A participatory theatre research project	\$145,000	Hole, R. & Chilton, R (Community co-lead; Community Living Society)	Schnellert, Stainton, City of New Westminster, Gold, et al.	
27	Vancouver Foundation	Community Building Now!	\$10,000	R. Hole and Arbuckle		
28	UBC VPRI Research Cluster Grant	Dis/ability Arts Culture & Public Pedagogy	\$40,000	Roman, L.	Hole, R., Johnston, K., Stainton, T., Beaudry, J. Irwin, R., Jarus, T., Andreotti, V., O'Donoghue, D., Cardwell, S., & Radar, M.	
29	SSHRC/CIHR Joint Funding Initiative "Healthy and Productive Work Initiative"	BC Transitioning Youth with Disabilities and Employment –	\$138,000	Hole, R.	Bottomff, Corbett, Schnellert, Stainton, and Young	

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		"The TYDE Project"				
30	Ministry of Education	In Situ Pedagogical Communities of inquiry	\$125,000	Leyton Schnellert w/ Kathy Sanford, UVIC & Paige Fisher VIU, Co-PIs		
31	Vancouver Foundation	Sexual Health Knowledge and Intellectual Disability	\$142,000	Leyton Schnellert, Rachelle Hole Co-PIs	Tim Stainton	
32	BC Ministry of Education	Rural Education Advisory/ Growing Innovation in Rural Sites of Learning	\$60,000	Leyton Schnellert		
33	SSHRC Insight Grant		\$42,330			
34	SSHRC Connection Grant		\$24,745			
35	Hampton Grant, UBC		\$3,000	Virginie Magnat		
36	FCCS	Travel Grant	\$1,000	Virginie Magnat		
37	SSHRC	Water Laws: Lessons from Indigenous and Colonial Stewardship		Deborah Curran, Val Napoleon (University of Victoria)	John Janmaat	
38	National Science Foundation	\$227,464.29 (US)	\$11,754.44 (US)		J. Wagner, CO- PI, and C. Schreyer, Co-I	

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39	Okanagan Basin Water Board		\$13,411		Wagner Co-I	
40	FCCS Annual Visiting Scholar Fund –	Min Sook Lee	\$3,000	Ruthann Lee		
41	UBCO IRG “	Bodies, Land, and Labour: Feminist Art and the Decolonial Politics of Relationality	\$5,000	Ruthann Lee		
42	SSHRC IDG	Multicultural Missions: Korean Diasporas, Evangelism, and Aboriginal-Settler Relations in Canada	\$44,484	Ruthann Lee		
43	Hampton Fund	Que(e)rying Campus Space: Experiences of Queer and Racialized Students at UBCO	\$23,740	Ruthann lee		
44	Indigenous and Northern Affairs Canada (via the University of Ottawa)		\$112,700	Ramon Lawrence PI; Mike Evans Co-PI.		
45	BC Ministry of Social Development and Social Innovation: Research and Innovation (R&I) stream of the Community and	Total award \$1,970,000 (Amount to UBC O, \$85,000)	\$85,000	Okanagan Nation Alliance PI		Rachelle Hole and Mike Evans

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	Employer Partnerships program					
46	BC Ministry of Advanced Education Contract		\$103,300	UBC Okanagan (Mike Evans PI) of behalf of the Indigenous Language Fluency Degree Consortium		
Total (US Conversion April 30) = \$2,954,702						

ICER 2016-2017 Continuing Grants:

	Agency	Title	Amount	Primary Investigator	Co-Investigator	Collaborator
1	BCCF	Preferences for Wildlife Management in BC	\$50,000	J. Janmaat	Jesse Zeman	
2	BCFAIP	Economic, Social, and Environmental Benefits of Riparian Rehabilitation as a Climate Change Adaptation Strategy for Agriculture	\$60,743	Bernard Bauer	John Janmaat	
3	CADTH	Engaging publics on reimbursement decision-making for	\$32,800	M. Burgess		

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		expensive drugs for rare diseases.				
4	CCSRI	Canadian Centre for Applied Research in Cancer Control (ARCC).	\$1,000		M Burgess = 23 others	
5	CIC Infrastructure Grant from Inclusion BC		\$40,000	R.Hole		
6	CIHR	Diversifying health human resources: Exploring the experiences of practitioners with disabilities in the health professions	\$200,000	T. Jarus	Hole et al. (Lead researcher at the UBC Okanagan)	
7	Community Futures Development Corporation	Income security and a Living Wage: a "Made in Revelstoke" Initiative for Poverty Reduction	\$12,430	Mike Evans	Jon Janmaat (CI), Ken Carlaw (CI)	
8	Geothink: Rapid Response Think Tank	Mapping News Poverty	\$6,000	Jon Corbett	April Lindgren (Ryerson)	
9	I JELF/BCKDF Humanities Data Lab		\$41,000	Constance Crompton		
10	Interior Health, Evidence Informed Practice Challenge	Kelowna Food Assessment	\$15,000	Jill Worboys	Jon Corbett	

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11	Mitacs/Central Okanagan Foundation/United Way	Mapping for Change: A Case Study of Enhancing Informational Exchange and Collaboration Through Geoweb Technology	\$70,000	Jon Corbett		
12	NIH/NCATS	Engaging University Stakeholders for Biorepository Research			D. Dohan, E. Boyd, B. Koenig, S. Dry, A. Brown, M. Burgess, K. O'Doherty	
13	Patient Centered Outcomes Research Institute (US)	Describing the comparative effectiveness of colorectal cancer screening tests: The impact of quantitative information.	\$502,000		M Burgess, K O'Doherty	
14	Social Sciences and Humanities Research Council of Canada	Re-mediating Curtis (Research Creation grant)	\$293,900	Stephen Foster (PI)	Mike Evans	
15	Social Sciences and Humanities Research Council: Partnership Grant	How the Geospatial Web 2.0 is Reshaping Government-Citizen Interactions	\$130,000	Renee Sieber	Jon Corbett CI and 10 others	
16	SSHRC	The participedia project: A global partnership to			J Abelson, M Burgess et al	

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		create and mobilize knowledge about democratic innovations				
17	SSHRC – Insight	Lesbian and Gay Liberation in Canada Project/ Coding Character	\$59,000	Constance Crompton		
18	SSHRC Connections Grant		\$33,040	John Wagner		
19	SSHRC Insight Development Grant	Building Capacity to Investigate Interprofessional Child Welfare Expertise	\$37,500	Judy Gillespie		
20	SSHRC Insight Development Grant		\$55,000	Olsen, L.	Hole, R	
21	TYDE Facilitation Support from the UBC O DVC & Principal		\$10,000	R. Hole		
22	UBC Start-up Funds		\$7,000	Bonar Buffam		
23	UBC TLEF	i-Ethics: Implementation of an Integrated Ethics Curriculum in the Health and Human Service Programs at UBC	\$43,000		Judy Gillespie	

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24	US Agency for Healthcare Research & Quality	Engaging Diverse Communities to Inform California's Newborn Screening Program.	\$200,000		B Koenig, R Currier, M Burgess, K O'Doherty.	
		Total = \$1,899,413				

2016-17 PUBLICATIONS, EXHIBITIONS AND PERFORMANCES BY ICER MEMBERS

Baumbusch, U., Moody, E., **Hole, R.**, Jokinen, N., Stainton, T. (March 2017). Perspectives of aging adults with intellectual disabilities and family members. *Journal of Policy and Practice in Intellectual Disability* (In Press)

Bekar, C.T., **K.I. Carlaw** and R.G. Lipsey (Forthcoming) "GPTs in Theory, Applications and Controversy: A Review" Accepted January, 2017, *Journal of Evolutionary Economics*.

Buffam, Bonar (in press). 'Cultural confessions: Law and the racial scrutiny of the Indo-Canadian Home in Metro Vancouver,' *Crime, Media, Culture*, Published online first November 16, 2016.

Burgess, MM, H Longstaff, K O'Doherty. Assessing deliberative design of public input on biobanks. In S. Dodds and RA Ankeny (Eds) *Big picture bioethics: developing democratic policy in contested domains*. Routledge Press, 2016: 243-276. (Refereed)

***Carlaw, K.I., M. Evans, L. Harris, and J. Janmaat** (November 2016) "A Living Wage for Revelstoke, BC: Economic Impact Assessment Report", Institute for Community Engaged Research, UBC Okanagan.

Chau, S. (2016). Stages of Immigrant Settlement: A Photovoice Exhibition. A 2-day presentation at A Welcoming Communities Summit, Okanagan College (Penticton Campus), hosted by the South Okanagan Similkameen Local Immigration Partnership Council, Penticton, BC, Canada, June 17th-18th, 2016.

Cochrane, L., Corbett, J.M., Evans, M., & Gill, M. (2016). Searching for social justice in GIScience publications. *Cartography and Geographic Information Science*, 1-14.
<https://doi.org/10.1080/15230406.2016.1212673>

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Constance Crompton and Michelle Schwartz, "Lesbian and Gay Liberation in Canada: Representing the Dyke Dynamo." *Digital Studies/Le champ numériques*. 5.1 (2015). n.p. 5665 words (completed 50% of the work on this article).

Corbett, J. M. & Mann, R. (2012). Tlowitsis re-imagined: the use of digital media to build nation and overcome disconnection in a displaced aboriginal community. Re-published in *ICT's for Advancing Rural Communities and Human Development*. IGI Global. DOI: 10.4018/978-1-4666-0047-8.ch011

Corbett, J. M., Brennan, S., & Whitely, A. (2016). Harnessing the Chaotic: Using the Participatory Geoweb to Make Sense of Forest Fires. *International Journal of E-Planning Research (IJEPR)*, 5(3), 27–41.

Corbett, J.M., *Cochrane, L.*, & Gill, M. (2016). Powering Up: Revisiting Participatory GIS and Empowerment. *The Cartographic Journal*, 53(4), 335–340.
<https://doi.org/10.1080/00087041.2016.1209624>

Corbett, J.M., Wright, S. & *Hamilton, C.* (2016). You Are Where You Eat: Developing an online tool for community food mapping. In Hallstrom, L. K., Beckie, M. A., Hvenegaard, G. T., & Mündel, K. (Eds.). *Sustainability Planning and Collaboration in Rural Canada: Taking the Next Steps*. University of Alberta.

Cornelissen, E., Mitton, C., Davidson, A., **Reid, C.**, **Hole, R.**, Visockas, A. & Smith, N. (June 2016). Fit for Purpose? Introducing a rational priority setting approach into a community care setting. *Journal of Health Organization and Management* 30 (4). <http://dx.doi.org/10.1108/JHOM-05-2013-0103>.

Crompton, Constance "Embodying the Solution to Degeneration: Eugen Sandow's Effortless Labour." *Nineteenth Century Studies* 26:1 (2012). 291-305.

Crompton, Constance, Richard J. Lane, and Ray Siemens Eds. *Doing Digital Humanities: Practice, Training, Research*. Toronto: Routledge, 2016 (408 pages).

Dulic A. Music of Heavens Prints, with Jessica Denis , FINA Gallery

Dulic, A. Becoming Land Prints, 2016, Aleksandra Dulic, Kenneth Newby Gallery Zvono, Belgrade Serbia -this is international exhibit

Dulic, A. From a Dream, 2016, The Electronic Literature Organization Screening, Digital Humanities Summer Institute

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Dulic, A. Social Life of Water, 2016, Kelowna Heritage Museum, Kelowna British Columbia - This is a major 8 months long museum exhibition created with the original content drawn from our diverse community members and multiple project partners.

Dulic, A. Winged Horses of Heavens, 2016, The Electronic Literature Organization Screening, Digital Humanities Summer Institute

Gillespie, J. (2016). Forms and Strategies for Integrated Working in Child Welfare. In D. Fuchs, D. Badry, M. Montgomery, & D. Kikulwe (Eds.), *Transforming Child Welfare: Interdisciplinary Practices, Field Education, and Research* (pp. 27-41). Regina: SK: University of Regina Press.

Hood, R., **Gillespie, J.** & Davies, J. (2016). A conceptual review of interprofessional expertise in child safeguarding. *Journal of Interprofessional Care*, 30(4), 493-498 doi: 10.3109/13561820.2016.1173656.

Hughes, J., Rocke, C., & **Chau, S.** (2016). "Act like my friend:" Mothers' recommendations to improve relationships with their Canadian child welfare workers. *Canadian Social Work Review*, 33(2).

Jefferess, D. "Cosmopolitan Appropriation or Learning? Relation and Action in Global Citizenship Education." *Globalization and Global Citizenship: Interdisciplinary Approaches*. Eds. Irene Langran and Tammy Birk. London: Routledge, 2016: 87-97.

Lindgren A, **Corbett J.M.** and Hodson J. (2017). Newsrooms outside the big cities are closing, and with them goes the critical information citizens require for everyday life. *Policy Options* January 23, 2017 (<http://policyoptions.irpp.org/magazines/january-2017/canadas-local-news-poverty/>)

Macintyre Latta, M., L. Schnellert, K. Ondrik*, and M. Sasges. (2017). Curricular Enactment's Community (Re)Making. *Journal of Curriculum Studies*. 49(3): 255-272.

Cole Mash, **Constance Crompton**, the INKE Research Group, Travis White "Unknown But Not Unknowable: The Network of Identified and Unidentified Hands in the Social Edition of the Devonshire Manuscript." *Scholarly and Research Communication*, 7.2/3 (2016). n.p. 4923 words (completed 40% of the work on this article).

More, J., Williams, B. & **Gillespie, J.** (2016). Reformulating understanding of productivity for clinical social work practice. *Critical Social Work*, 18(1), 23-40.

Schnellert, L. (2017). Directions for self-regulated learning research: Connecting dots between 21st century learning, pedagogy and valued outcomes for learners. *Canadian Association for Educational Psychology Dialogic*. 3(1): 19-20.

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Stainton, T., **Hole, R., Corbett, J.M.** (2016). Mapping inclusive employment: A participatory mapping research project. *Journal of Intellectual Disability Research*, 60 (7), 740.

ICER PRESS Publications:

Exhibition Catalogue: Cool Arts Bio Diverse Ability: An exhibition at the Vernon Public Art Gallery. July 2016.

Exhibition Catalogue We Are Citizens 2016: An exhibition at the Alternator Centre for Contemporary Art, October 6 to 22, 2016. October, 2016.

Collaborative Inquiry Transforming Education Together. Produced by Leyton Schnellert, PhD. Videographer Lisa Nielsen. June 2016

*Rewriting the traditional grammar of schooling: Vernon Community School. Produced by **Leyton Schnellert, Margaret Macintyre Latta**, Kim Ondrik & Murray Sasges. Videographer Lisa Nielsen. July 2016.*

*Becoming Educators: Learning with Adolescents. Produced by **Leyton Schnellert, PhD**. Videographer Lisa Nielsen. Aug-16*

*Working Together to Create Student-Driven Interdisciplinary Learning: Desert Sands Community School. Produced by **Leyton Schnellert, PhD**. Videographer Lisa Nielsen. October 2016.*

*“Comfortable to take risks”: Seaton Secondary School. Produced by **Leyton Schnellert, PhD**. Videographer Lisa Nielsen. December 2016.*

*Eagle Mountain Middle. Learners at the Centre: Re-imaging Learning in the Middle years. Produced by: **Leyton Schnellert, PhD**. Videographer: Lisa Nielsen. Editor: Odessa Shuquaya. February 2017.*

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GRADUATE STUDENTS AND POSTDOCS IN PROGRAMS

ICER members currently supervise 44 Masters and 45 Ph.D. Students. In the 2016-2017 reporting period, 13 Masters and 6 Ph.D. students graduated.

ICER Masters Students 2016-2017:

M A	Students	Supervisor	Co- Supervisor	Committee member
1	Aaron Derickson	Jeannette Armstrong		John Wagner
2	Adam Fulton			Michael Burgess
3	Adrian Zuydudyn	Sabre Cherkowski		
4	Alyssa Christensen	Leyton Schnellert		
5	Ambereey John	Aleksandra Dulic		
6	Andy Sun *			Shirley Chau
7	Angelica Alejandro		Shirley Chau	
8	Brooke Haller	Leyton Schnellert		
9	Brooke Mueller			Sabre Cherkowski
10	Carrie Heldman	Leyton Schnellert		
11	Carson Loftsgard	Leyton Schnellert		
12	Casey Hamilton	Jon Corbett		
13	Corinne Derickson	Virginie Magnat		
14	Darren Tanaka	Bonar Buffam		
15	Dave Rempel	Leyton Schnellert		
16	David Lacho			Jon Corbett
17	Dorjan Leckie			Jon Corbett
18	Genie Griggs	Sabre Cherkowski		
19	James Littley	Jon Corbett		
20	Jasmeet Bahia	Bonar Buffam		Jon Corbett
21	Jeanette Angel	Aleksandra Dulic		
22	Jeff Boniface			Rachelle Hole
23	Jesse Zeman	John Jamaat		
24	Katarina Trapera			Bonar Buffam, David Jefferess
25	Katherine Elizabeth Jones	Rachelle Hole		
26	Kelly Leung	Rachelle Hole		
27	Kyla Hadden	Leyton Schnellert		
28	Kyla Hadden			Sabre Cherkowski

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29	Lauren Arnold		Jon Corbett	
30	Lynda Reil	Bonar Buffam		
31	Madeleine Greig			Michael Burgess
32	Mariel Belanger	Virginie Magnat		Ruthann Lee
33	Mark Rosvold	Shirley Chau		
34	Megumi Yamamoto	Aleksandra Dulic		
35	Nicole Crane	Leyton Schnellert		
36	Paul Richard	Sabre Cherkowski		
37	Rina Garcia Chua			David Jefferess
38	Suzanne Johnson			John Wagner
39	Tanya MacKeigan	Rachelle Hole		
40	Taylor Wells	Rachelle Hole		
41	Teresa Peters	Leyton Schnellert		
42	Thomas Jonsson			Virginie Magnat
43	Trystan Carter			David Jefferess
44	Vanessa Mitchell	Rachelle Hole		

ICER Ph.D. Students 2016-2017

	Students	Supervisor	Co Supervisor	Committee member
1	Adrian Byram			Michael Burgess
2	Amarpreet Kaur			John Janmaat
3	Carlene Dingwall		Rachelle Hole	
4	Claire Fogal	Virginie Magnat		
5	Colleen Larson			Sabre Cherkowski
6	Corinna Netherton	Jeannette Armstrong	John Wagner	
7	Dilsora Komil-Burley	Bonar Buffam		
8	Donna Kozak	Leyton Schnellert		
9	Earlene Roberts	Rachelle Hole		
10	Eury Chang			Virginie Magnat
11	Eva-Marie Kovacs-Kowalke	John Wagner		
12	Jeannette Angel			John Wagner
13	Jelena Rubi	Aleksandra Dulic		
14	Jennifer Kelly	Sabre Cherkowski		
15	Jewelless Smith	Rachelle Hole		Leyton Schnellert

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16	Joanne Taylor	John Wagner		
17	Julia Ulehla			Virginie Magnat
18	Katey Kyle	Diana French		Jon Corbett
19	Katrina Plamondon			Michael Burgess
20	Keith Duhaime	John Janmaat		
21	Kelly Hanson			David Jefferess
22	Kelly Hanson	Sabre Cherkowski		
23	Kim Taylor			Michael Burgess
24	Kimberley MacNeil			Leyton Schnellert
25	Krista Arias			Ruthann Lee
26	Lindsay Diehl			David Jefferess; Ruthann Lee
27	Mary Kjorven		Rachelle Hole	
28	Matt Husain			
29	Menno Salverda	Judy Gillespie		
30	Milorad Jokic	Aleksandra Dulic		
31	Nargiz Rahimova		John Janmaat	
32	Natalie Munzie	Judy Gillespie		
33	Nelson Jatel			John Wagner
34	Nicky Dhaliwal			Michael Burgess
35	Rachel Field	John Janmaat		
36	Rob Friburg	Jon Corbett		
37	Robyn Bunn	Lawrence Berg		Ruthann Lee
38	Ryan Hendricks	Rachelle Hole		
39	Sean St. Jean	Judy Gillespie		
40	Sevinj Askerova			Rachelle Hole
41	Shelley Cook	Jon Corbett	Rachelle Hole	
42	Shelley Moore		Leyton Schnellert	
43	Stephen Decker			John Wagner
44	Tina Marten			Shirley Chau
45	Toby Katrine Lawrence		Ruthann Lee	

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ICER Masters Students Graduated 2016-2017:

	Student	Supervisor	Co -Supervisor	Committee Member
1	Mark Buchanan,	Constance Compton		
2	Ailsa Beischer	Jon Corbett		
3	Blake Allen			John Janmaat
4	Carrie Sutch	Leyton Schnellert		
5	Daan Hoekstra			John Janmaat
6	Gillan Vlasschaert			Jon Corbett
7	Jonathan Bepple			John Janmaat
8	Jordan Bennett	Stephen Foster		Jefferess; Magnat
9	Kenneth Wanderler	Saber Cherkowksi		
10	Kim Ondrik	Leyton Schnellert		
11	Marina Nogueira			John Janmaat
12	Maureen McLaughlin	Leyton Schnellert		
13	Naryn Searcy	Leyton Schnellert		

ICER Ph.D. Students Graduated 2016-2017:

	Student	Supervisor	Co - Supervisor	Committee Member
1	Gabrielle Legault	Jon Corbett		Rachelle Hole
2	Ivan Jurkovic	Alecsandra Dulic		
3	Joanna Pierce	Judy Gillespie		
4	Logan Cochrane	John Janmaat	Jon Corbett	
5	Ozgul Akinci	Virginie Magnat		
6	Solomon Geleta (Colorado State)		John Janmaat	

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Goals

ICER'S STRATEGIC GOALS

Vision

The Institute for Community Engaged Research (ICER) is dedicated to knowledge creation and exchange that promotes equality, equity, and justice at the local, national, and international levels.

Mission

ICER supports socially engaged research with communities internationally, nationally, and in the Okanagan Valley. Sharing a commitment to research that supports diversity, equity, and social justice, the Institute facilitates the participation of community members, organizations, students, and academics as co-researchers. ICER is a hub for building relationships, collaboration, and effective knowledge creation and exchange through research clusters operating across disciplinary and institutional boundaries. ICER operates fluidly in response to and in recognition of changing social issues.

LINKS WITH UBCO RESEARCH AND STRATEGIC PLANS

The ICER mission and vision are closely aligned with the current UBC Okanagan Strategic Research Plan as well as the Strategic Research Plan currently in draft form. The current plan emphasizes the importance of interdisciplinary partnerships and excellence in research. The research cluster structure of the Institute is designed to facilitate inter-disciplinary excellence, impact, and relevance. Both the approach and the research foci we have articulated track closely to the UBC Okanagan document, *Aspire: Envisioning our Future*. In the *Aspire* document research excellence and community engagement (in local and global terms) figure prominently.

Coherence with UBC Okanagan academic plan

Our mission and vision also align well with the UBC Okanagan Academic plan. ICER contributes to the ongoing and iterative development of “an integrated research community” by bringing together interdisciplinary configurations of scholars in research defined by, and for “a locally responsive, globally conscious community.” By creating research opportunities that articulate diverse points of view, and facilitating new and various solutions to social problems, our research also contributes to “a flexible, adaptable, and sustainable community.” Individually and collectively, the members of the Institute have demonstrable track records for producing high quality scholarship that effectively and respectfully builds on community partnership.

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Coherence with UBC Aboriginal Strategic Plan

Several ICER members are deeply engaged in Aboriginal and Indigenous research. Undertaking work with communities, in support of issues relevant to those communities. This deep engagement is well reflected in the projects that ICER has co-organized, hosted and sponsored over the past year. In addition, we have as founding partners for the Institute, the Okanagan Nation Alliance and the En'owkin Centre; the inclusion of these organizations and associated individuals provide a strong foundation for future work with on Indigenous issues in the Okanagan.

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Activities and projects

There has been substantial activity in and around ICER throughout the 2016-2017 academic year. We have obtained support and funding to undertake two of our own research projects. Furthermore, we have organized, hosted, sponsored and supported many well attended events. We have held these events in the Institute, in other meeting places throughout the university, as well as off campus. We have organized and delivered events both independently, as well as in collaboration with ICER members, other research institutes on campus and academic departments.

PROJECTS

ICER has begun to successfully seek funding to support the undertaking of research related projects that will leverage our membership and resources and be managed within the Institute.

City of Kelowna Reconciliation Training Project

Canada's Truth & Reconciliation Commission, as part of its final report in 2015, states: 'We call upon federal, provincial, territorial, and municipal governments to provide education to public servants on the history of Aboriginal peoples, including the history and legacy of residential schools... This will require skills-based training in intercultural competency, conflict resolution, human rights, and anti-racism.'

On January 30, 2017, Kelowna City Council supported a proposal for city staff to work with the En'owkin Centre and the Institute for Community Engaged Research at the University of British Columbia Okanagan to develop a framework and educational resources for the City of Kelowna's approach to reconciliation. Currently city staff are in talks with ICER representatives (Jeannette Armstrong, Jon Corbett and Joanne Carey) and En'owkin Centre (Lauren Terbasket) on how to design and deliver the project.

Community University Portal Project

ICER, in partnership with the Regional Socio-Economic Development Institute of Canada (RSEDIC) and the UBC Okanagan Innovation Library is developing a Community-University portal to provide a virtual community entry point with the purpose of supporting collaboration. The portal will be an interface between the University and the community that will allow for two-way interaction. Community members and organizations will use the portal like a virtual library service desk, posing questions and problems. Some of these questions may lead to new research relationships, while some may support experiential learning opportunities. The portal will be constructed in the spirit of community-based research, where the community drives the process and method of

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engagement – posing questions and problems around which relationships can both coalesce and grow. The collaborations and partnerships that result from the portal will provide unique opportunities for both community-engaged research and transformative student learning for faculty and students.

SPEAKER SERIES, CONFERENCES, SYMPOSIA AND EVENTS

In 2016-2017, ICER has organized, supported, hosted and sponsored many community oriented lectures, talks, symposia and workshops.

‘Starting a Conversation’ Speaker Series

Increasingly UBC Okanagan is inviting distinguished speakers to our campus to share their research. This is greatly enriching the research ethos on our campus. However, often these talks are formal in their nature and delivery, and there is little opportunity for graduate students and faculty members to engage in a dialogue with these visitors. The Starting a Conversation series is an opportunity for ICER members and affiliates to share their research ideas, methodologies, questions or findings with an interested audience of students, peers and community members in a relaxed, collegial, atmosphere.

In 2016-2017 ICER hosted seven speakers as a part of the series. Each was held in the institute and well attended (with up to 30 members of the audience) by faculty members, graduate and undergraduate students, as well as community members.

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Okanagan Research Forum

Okanagan Research Forum: Building A resilient Okanagan Landscape, December 5, 2016. Attended by 100. Co-organized with BRAES and the BC Wildlife Federation and the Okanagan Nation Alliance (ONA).

The Okanagan Research Forum: Building a Resilient Okanagan Landscape, was hosted by the UBC Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) and the UBC Institute for Community Engaged Research (ICER), in collaboration with partner organizations the BC Wildlife Federation and the Okanagan Nations Alliance. The Forum encouraged knowledge sharing and dialogue between UBC Okanagan Researchers and the broader community, including government and local organizations. In the future, we will organize the Forum every two years with a specified theme. This year's theme was resilience, a particularly relevant topic for the Okanagan region considering the pressures we face due to climate change, population growth, and changes in land use.

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Indigenous Languages Fluency Symposium

Indigenous Languages Fluency Symposium, February 17-19, 2017. Kelowna and Penticton BC. Attended by 135 people from across BC and the Yukon, with speakers from Florida and Hawai'i.

This symposium brought together communities, institutions, and traditional knowledge holders and scholars to address the current situation related to Indigenous Language Fluency by sharing innovations in programming and approaches currently underway. It provided an opportunity for experts to share, learn, and co-create a common body of knowledge, from which the creation of a collaborative cross-institutional Indigenous Language Fluency Degree can be strategized.



BC Food Systems Network Annual Gathering

BC Food Systems Network Annual Gathering, July 15-17, 2016 Penticton BC attended by 123 people from across the province.

The 18th Annual Gathering of the British Columbia Food Systems Network brought together, local food producers, community organizers, consumers, academics, diverse agencies and First Nations champions to learn from one another and build relationships needed to collectively advance food policy and increase food security in our province. The gathering's aim was to create healthy, just and sustainable food systems in BC by strengthening connections, nurturing capacity and engaging in policy development.

Creating the Life You Want

Creating the Life You Want: Person-Directed, Inclusive and Connected A Conference for Self-Advocates and Families About Family Governance October 28-29, 2016. Attended by 58.

The Creating the Life You Want conference covered different ways individuals and families are directing their own supports and services by pooling their resources into family-governed and user-led supports for people with intellectual diverse abilities. It provided the opportunity for families and their partners in BC who are using collective models of support to lead the life they want. The meeting ultimately supported the ways people with diverse abilities can creatively

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choose and direct how they are supported to work, live and contribute as full citizens in their communities

The Community Culture and Global Studies Graduate Brown Bag Speakers Series

In 2016-2017, ICER has hosted the new community Culture and Global Studies Graduate Brown Bag Speakers Series. These events are designed to be cohort building for CCGS and associated graduate students from throughout the UBC Okanagan campus. Students shared their research with each other and provided feedback on presentations. The events are also an opportunity to check in with other grad students, socialize, and build community.



The CCGS Graduate Brown Bag Speakers Series: Photo C. Schreyer, 2017

Gender and Women's Studies Speaker Series

Since January 2017, ICER has hosted the Gender and Women's Studies Speaker Series. Three events have been held in the Institute since taking on this hosting role.

Sociology Speaker Series

ICER worked directly with the Sociology Guest Speaker series to support Elizabeth Marino, Assistant Professor of Anthropology and Sustainability, OSU, Cascades to present "The Social Life of Climate Change: A discussion of displacement, climate, and colonialism" March 6, 2017.

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Discussion related to the Alt Right on Campus

ICER hosted one meeting related to discussing the presence of the Alt Right on campus and the development of a Critical Pedagogy group to support the development of an ongoing teaching discussion group with a specific focus on anti-oppressive pedagogies and resistances to them. This has resulted in the ICER co-hosting a workshop with Community Culture and Global Studies on anti-oppressive pedagogies on Thursday, May 11. This workshop will be hosted by Amy Perreault and Janey Lew from the Indigenous Initiatives division of the Centre for Teaching, Learning, and Technology at UBC Vancouver.

SCHOLARSHIP PROGRAM

In 2017 ICER began a new scholarship initiative. We are awarding two \$1,000 scholarships to students involved in community engaged research. The scholarships are available to current UBC Okanagan graduate, or in exceptional circumstances, undergraduate students.

The recipients should be actively involved in community engaged research projects or activities, and have a community partner. The purpose of the scholarship is to support students with their research and their efforts to build closer ties with the community. Our application deadline was April 5, 2017, we received 9 applications.

ICER NEWSLETTER

In 2016-17 we began to produce a monthly newsletter to reach out to our membership (community members, faculty, graduate students and staff). The newsletter highlights research being undertaken by our membership; provides information about upcoming events on campus and in the community, as well as potential funding opportunities.

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Community Outreach and Communications

ICER exists to enhance university and community engagement. Partnerships include activities such as joint research projects, funding agreements, student supervision, and knowledge exchange.

COMMUNITY OUTREACH

We have been actively collaborating with the Centre for Inclusion, The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) & Citizenship and the Regional Socio-Economic Development Institute of Canada (RSEDIC) inside the UBC System. In addition, we have collaborated with numerous research partners in primary research and knowledge translation activities, including: the En'owkin Centre, Kelowna Community Resources (Okanagan Refugee Geolive Map); Community Futures Revelstoke; Central Okanagan Foundation; Mitacs; Okanagan College: United Way; Okanagan Nation Alliance; South Okanagan Immigrant and Community Services; Cool Arts Society to mention a few.

We also recognize that in the upcoming year (2017-2018) we will need to invest substantial energy into further reaching out to community partners as well as other organizations in the community. We hope that this will be partially achieved using the Community Research Portal, however, we will also need to focus on marketing and promoting the Institute in novel settings.

COMMUNICATIONS

ICER has had significant coverage in the news, radio and television media this past year. Highlights include coverage in the Globe and Mail newspaper, CBC radio and Global TV to name a few.

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Looking ahead to 2017-2018

In the upcoming year ICER's strategic directions and goals are as follows³:

CREATE EDITORIAL POLICIES FOR MANAGING THE PRESS.

Our newly formed editorial board will develop editorial policies for ICER press. They will:

- Identify publication types and consider the launch of a new open access journal related to community engaged research, and
- Establish protocols in the management, peer review process, publication and marketing of articles, books, catalogues and other manuscripts.

MANAGE RELATIONSHIPS WITH COMMUNITY

We recognize the continuing need to consolidate the relationship with existing community partners, as well as to develop new relevant relationships. We hope to achieve this specifically through:

- Building on our relationship with Student Learning Services in pursuance of introducing the City Studio program⁴ in Kelowna with partnerships in the City of Kelowna, Okanagan College and the regional districts,
- Reaching out directly to relevant organizations in our community and establishing clear rationales around developing partnerships, and
- Fostering and supporting research relationships between the community and researchers on campus through the community/university research portal project.

DELIVER A MORE ROBUST SCHOLARSHIP PROGRAM

We had considerable interest this past year in the ICER Scholarship. We received nine full applications, of which three proposals were funded. In this light, we:

³ Please note that these directions and goals have been established prior to our Annual General Meeting, so they may change.

⁴ The CityStudio concept is the creation of an innovation hub where City staff, students from post-secondary institutions, and community co-create experimental projects to make our cities more sustainable, liveable and joyful.

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- Will work with the UBC Okanagan Development office to pursue funds to support specific programs such as the ICER Scholarship,
- Explore the possibility of partnering with other scholarships offered and existing internship programs in the community.

CONTINUE TO IMPROVE OUT THEORY AND PRACTICE

We will continue to pursue excellence in Community Engaged Research and growing the Institute to include, represent and support researchers working in our field of research. To achieve this, we will:

1. Carry on with the existing speaker series and support for symposia, conferences and other events,
2. Reach out to include the community more effectively in these events (we are considering developing an evening speaker series in downtown Kelowna), and
3. Continue to support existing and ongoing initiatives within the university, including the Community Service Learning program and the Community Based Research committee.

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ICER Governance and Membership

GOVERNANCE

Current Steering Committee Members:

- Jon Corbett, Institute Director
- Mike Evans
- Jeannette Armstrong
- Lawrence Berg
- Judy Gillespie
- Rachelle Hole
- Leyton Schnellert
- Jessica Stites-Mor

MEMBERSHIP

As of April 2017, ICER membership is as follows:

- 27 Full members (Faculty)
- 10 Associate members
- 7 International / National Collaborating Centers and Institutes
- 89 Graduate students
- 1 Technician
- 1 Staff

NEW MEMBERSHIP

Over the past year, at UBC Okanagan 4 new faculty members and one staff member, and from the community one member, has joined the Institute:

1. Bonar Buffam
2. Mary Butterworth
3. Cynthia Mathieson
4. David Jefferess
5. Ross Hickey
6. Heather Deegan (Interior Health)

For a detailed list of the ICER membership, please consult Appendix A.

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STAFF AND ADMINISTRATION

Dr. Jon Corbett is the current director of the Institute.

Joanne Carey is the current institute coordinator (0.5 FTE). Joanne works in conjunction with the director in the areas of planning, coordination, and communication regarding the Institute by:

- Organizing ICER-supported symposia, guest speakers, conversation starters series, quarterly meetings, AGM, general meetings
- Preparing the Institute's annual activity reports
- Monitoring the budget (in conjunction with the relevant financial office in the Office of Research Services)
- Promoting ICER research to the broader community in collaboration with university media relations officers
- Assisting with HR related to work-study, undergraduate, graduate student and staff appointments
- Developing and maintaining the ICER web site, and social media (Twitter and Facebook)
- Coordinating the production of ICER Press publications

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Contact Information

For general information or inquiries about ICER, please visit our website at: <http://icer.ok.ubc.ca/> or contact:

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E-mail: jon.corbett@ubc.ca

Joanne Carey, MA

Coordinator, The Institute for Community Engaged Research

(in the office, Tuesdays & Thursdays)

Tel: 250-807-9667

Email: joanne.carey@ubc.ca or Icer.ok@ubc.ca



INSTITUTE FOR
COMMUNITY
ENGAGED RESEARCH

ICER ANNUAL REPORT 2016-2017

Appendix A: ICER Membership

Full Members:

1. Luis Aguiar
2. Jeannette Armstrong
3. Lawrence Berg
4. Michael M. Burgess
5. Shirley Chau
6. John Corbett
7. Aleksandra Dulic
8. Michael Evans
9. Stephen Foster
10. Judy Gillespie
11. Rachelle Hole
12. Susan Holtzman
13. John Janmaat
14. Gareth Jones
15. Ruthann Lee
16. Virginie Magnat
17. Ashok Mathur
18. Colin Reid
19. Leyton Schnellert
20. Christine Schreyer
21. Jessica Stites Mor
22. John Wagner
23. Kenneth Carlaw
24. Sabre Cherkowski
25. Sue Frohlick*
26. Allison Hargreaves
27. Margaret Macintyre Latta

Associate Members

1. Ayumi Goto
2. Pamela Richardson

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3. Mary Stockdale
4. Constance Crompton**
5. Bonar Buffam*
6. Mary Butterworth*
7. Cynthia Mathieson*
8. David Jefferess*
9. Ross Hickey*
10. Heather Deegan

* Awaiting full membership during next AGM

** Became an associate member in April 2016

Community Partners

1. Alternator Centre for Contemporary Art
2. Canadian Mental Health Association
3. Central Okanagan Food Policy Council
4. City of Vernon
5. Community Service Learning Program (UBC Okanagan)
6. Community Engagement Strategist (UBC Okanagan)
7. Disability Resources Centre (UBC Okanagan)
8. En'owkin Centre
9. Independent Living Vernon
10. Interior Health
11. Inn From the Cold
12. Kelowna Community Resources
13. Living Positive Resources Center
14. Okanagan Fruit Tree Project
15. Okanagan Nation Alliance
16. Pathways Society
17. School District 10
18. School District 23
19. School District 67
20. School District 74
21. School District 83
22. South Okanagan Immigrant Community Services (SOICS)
23. UBC Okanagan Equity and Inclusion
24. Vernon Community School

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International / National Collaborating Centers and Institutes

1. Centre for Inclusion and Citizenship, UBC
2. CRUSH – Critcha Urban Sustainability HUB, Lund University Sweden
3. Department of Curriculum and Instruction, Faculty of Education (UVIC)
4. Faculty of Education (UBC Vancouver)
5. Icelandic Tourism Research Center (University of Akureiri & University of Iceland)
6. SPaCE – Sustainability, Partnerships and Community Engagement (Southern Cross University)
7. Wageningen University and Research Centre, The Netherlands

Annual Report 2016 – 2017

March 31, 2017

Institute for Healthy Living and Chronic Disease Prevention



THE UNIVERSITY OF BRITISH COLUMBIA



**Institute for Healthy Living and
Chronic Disease Prevention**
PARTNERS IN RESEARCH FOR BETTER HEALTH

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THE UNIVERSITY
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Our Vision

The Institute for Healthy Living and Chronic Disease Prevention is an innovative and collaborative research centre that places UBC Okanagan in the forefront of community-based health promoting research through advancing research methods, building research capacity and fostering the use of knowledge in ways that benefit individuals, families and communities, and reduce the burden of chronic disease.

Our Mission

The mission of the Institute for Healthy Living and Chronic Disease Prevention is to create and use new knowledge to enhance healthy living and chronic disease prevention through the development of interdisciplinary and community-based collaborations.

Introduction

The Institute for Healthy Living and Chronic Disease Prevention (IHLCDP) has concluded another very successful year in supporting the growth and impact of health research on our campus. Our knowledge exchange activities continue to attract diverse audiences from our region and across Canada. In large part, this success is due to increasing recognition of the exceptional research underway on our campus. Our capacity for enabling research teams to reach interested communities and knowledge users through our events and activities provides an increasingly valuable asset to researchers and is a clear demonstration of UBC's commitment to community engagement. In our annual report this year we highlight our achievements, provide a compilation of our knowledge exchange events, and feature our involvement in key research activities and training.

IHLCDP 2016-2017 Year in Review

We continue to support research focusing on healthy living and chronic disease prevention with the following activities:

- Providing our researchers with expanded opportunities for knowledge exchange and community engagement with 38 IHLCDP hosted or co-hosted events, and an attendance of over 1600.
- Strengthening ties with community-based partners and establishing new partnership activities with the IH Research Department, Bridge Youth and Family Services, Interior Savings Credit Union, Canadian Institute for the Relief of Pain and Disability, and Propel Centre for Population Health Impact.
- Working with Interior Health and other stakeholders as a member of the *Regional Alliance for Rural Health* Steering Committee to build a network to support action-oriented, community-engaged research collaborations that strengthen health and wellbeing in rural communities and enrich educational programs.
- Mobilizing research and action to promote wellbeing on campus through the Campus Health Voice Project activities, and participation on the UBC Wellbeing Steering Committee and the Wellbeing at UBC Okanagan Advisory Committee.
- Providing research teams with consultations and support with development and implementation of knowledge exchange activities and partnerships.
- Promoting research training opportunities for undergraduate and graduate students.
-

In 2016-2017 over 1600 people attended our knowledge exchange events.

IHLCDP Knowledge Translation and Exchange

Our Outreach and Engagement

During the past year the IHLCDP has expanded its knowledge exchange activities through our webinars and other events to in order to support the dissemination and use of our growing research evidence related to healthy lifestyles and chronic disease prevention into day to day applications, and evidence-based policy and practice in communities across our region and beyond. In the past year, we hosted or

co-hosted 38 events, and increased the number of community-based events over the previous year (see Table 1). The range of topics and events has also grown (see Appendix A for a complete list) as well as the number of people attending our events either in person or by webinar (see Table 2).

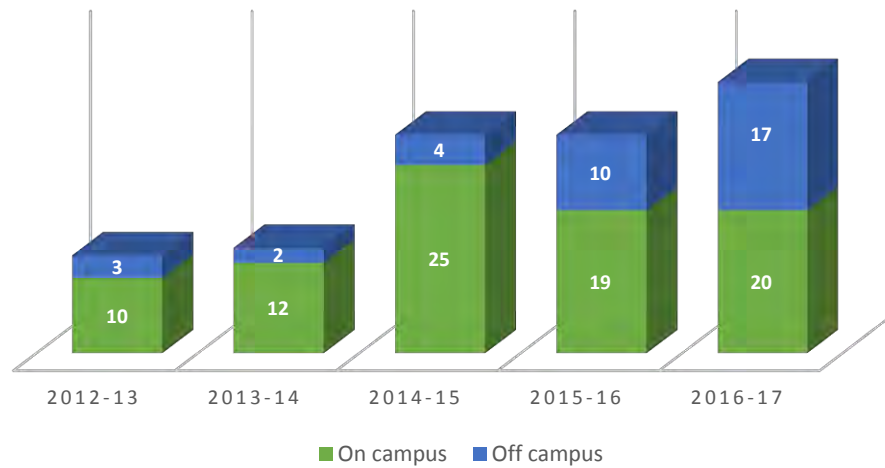
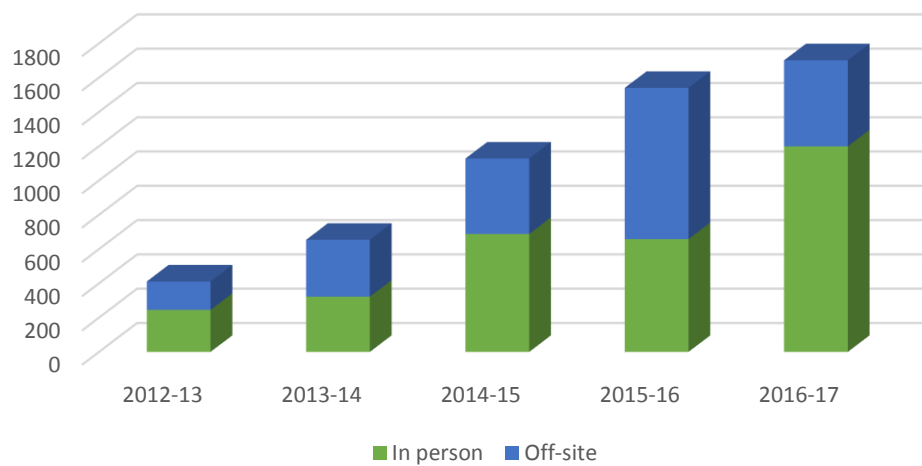
IHLCDP Knowledge Exchange Activities

- Partnerships in Research Seminar Series (co-presented by collaborative research teams)
- Research to Practice Seminar Series (co-hosted with North Okanagan Hospice Society)
- **New:** Campus-Community Partnership for Rural Health seminar series (co-hosted with the Interior Health Research Department)
- 4th Annual Okanagan Embrace Aging month (co-hosted with Interior Health and Interior Savings Credit Union)
- UBC Celebrate Research Week with IHLCDP hosted Café Scientifique (co-hosted with Interior Health and Interior Savings Credit Union) and invited Lunch and Learn session entitled, *Rural health in rural hands: Building partnerships with a regional alliance for health research*



The 4th Annual Okanagan Embrace Aging month, co-hosted with Interior Health and Interior Savings Credit Union, included over 20 educational opportunities and events focusing on an expanded number of topics related to healthy aging throughout March 2017. This year events were held in Kelowna, West Kelowna and Vernon as well as on the UBCO campus. Attendance over the month topped 1100, an increase of 51% over the previous year. The planning committee included: Dr. Deanne Taylor, Kim Barnes and Betty Brown (Interior Health), Corrine Johnson and Rod Rieu (Interior Savings Credit Union), Joyce Springate and Pat Andrews (community members), Nick Bray (UBCO Graduate student), Lindsay Burton (Alumni and Research Assistant, UBCO) Dr. Colin Reid (School of Health and Exercise Science), and Dr. Joan Bottorff and Jacquetta Benard from the IHLCDP.

Embrace Aging Welcomed New Partners: Interior Savings Credit Union as a co-host and supporter, as well as community members, Joyce Springate and Pat Andrews, and Nick Bray, student representative, to our planning committee.

TABLE 1: IHLCDP EVENT HISTORY 2012-2017**Table 2: Attendance at IHLCDP Events 2012-2017**

Featured IHLCDP Research Activities and Training

Campus Health Research Supports Wellbeing at UBC

On October 31, 2016, our Campus Health team joined Dr. Deborah Buzzard and others across our campus to activate the Okanagan Charter to demonstrate organizational commitment to health promotion and wellbeing at UBC Okanagan. Recognized at this event was the outstanding leadership and vision of Dr. Claire Budgen, IHLCDP Associate and Campus Health lead to December 2015, for her outstanding work to promote healthy campuses that laid the foundation for current efforts, the Okanagan Charter, and the Wellbeing at UBC initiative. A similar event was held at UBC's Vancouver campus, establishing Wellbeing at UBC as a campus-wide priority. Our Campus Health team is represented on the UBCO Wellbeing Advisory Committee and the UBC Wellbeing Steering Committee.

In support of Wellbeing at UBC, our Campus Health team, in collaboration with students, staff and faculty have been involved in a number of projects over the past year.

- VOICE 4 was launched to gather views on system factors influencing mental wellness at UBCO using a community-based participatory action research approach. With the support of 80 student co-researchers, over 4,000 completed Community Dialogue surveys have been collected. Members of the campus community have also been invited to share their views in interviews, or using photovoice and story capture methods. The team has obtained funding for a UBC Sustainability Scholar and Workstudy Undergraduate Co-Researcher to assist with data analysis over the summer and prepare reports of findings. The VOICE 4 research project is funded by Campus Health, and supported by the UBCO Workstudy Program, the VOICE Research Team, and the VOICE Advisory Committee.
- The Campus Health and VOICE team are evaluating the use of a treadmill desk in the UBCO Library to promote physical activity while studying. In this pilot project, students, staff and faculty are being encouraged to try out the desk and provide feedback by completing an online survey. To date, there have been 80 unique users and over 325 treadmill key sign outs. Users are invited to complete an online survey to provide feedback on the treadmill desk. UBCO TV prepared this video on the project:
<https://m.ubc.ca/okanagan/okvideo/search?search=Search&filter=treadmill+desk&feed=youtu-tube-ubcotv&id=WCnh1w-XakE>
- The VOICE team are collaborating with the UBCO Food Exchange to research the topic of student food security on campus. Supported by a grant from the Equity Enhancement Fund, the team completed a literature review on student food insecurity and university food banks, and hosted dinners with students to gather views about food security. An assessment of food security at UBCO was included in the VOICE 4 Community Dialogue survey, and responses will be analyzed over the summer.

Our Campus Health and VOICE teams have employed 7 undergraduate students as research assistants through the UBCO Workstudy Program, and over 80 undergraduate students joined our team as VOICE co-researchers.



Left to right: Melissa Feddersen, Campus Health Specialist; Blake Edwards, undergraduate student; Deborah Buszard, Deputy Vice Chancellor & Principal; Casey Hamilton, Campus Health Facilitator; and Joan Bottorff, Director, IHLCDP

Rural Communities as Hubs for Innovations in Health Promotion

The IHLCDP has taken an active role in a working group to form a *Regional Alliance for Rural Health* to increase and advance knowledge to improve rural health and wellbeing, through collaborative community-engaged action research on the social determinants of health. Initiated by Interior Health with enthusiastic support from multiple academic and health partners, the work has progressed to the point where a draft Protocol Memorandum of Understanding (MOU) has achieved approval by the current membership and a version of the MOU is proposed for partner sign off in 2017. Members of the Regional Alliance currently include six post-secondary institutions, two Divisions of Family Practice Chapters, the First Nations Health Authority, Interior Health representatives (Research Department, Rural Hospital and Community Integrated Service administrators and Aboriginal health), and two local government association representatives.

Building International Research Collaborations

In partnership with IHLCDP Associate Dr. Cristina Caperchione and with the support of the UBC Visiting Professor Fund, the IHLCDP co-hosted a visit by Dr. Kate Hunt, Associate Director and Professor, MRC/CSO Social and Public Health Sciences Unit, Institute of Health and Wellbeing, University of Glasgow, Scotland in September 2016. Dr. Hunt provided an IHLCDP seminar on her research with Football Fans in Training, a weight management and healthy living program for overweight men, and another on the development, evaluation and roll-out of public health interventions. She also met with research teams, and provided individual consultations with faculty, students and other stakeholders in the community. The visit has resulted in expanding research collaborations between UBCO researchers and Dr. Hunt and her team.



Left to right: Dr. Kate Hunt, University of Glasgow and Drs. Cristina Caperchione and Joan Bottorff, University of British Columbia Okanagan

International Visiting Scholars to the IHLCDP in 2016-2017

Dr. Kate Hunt, Associate Director and Professor, MRC/CSO Social and Public Health Sciences Unit, Institute of Health and Wellbeing, University of Glasgow, Scotland

Dr. Uba Backonja, Assistant Professor, Nursing & Healthcare Leadership; Adjunct Assistant Professor, Biomedical Informatics & Medical Education, School of Nursing, University of Washington, Tacoma

Featured research focusing on older adults

Supporting mental health in rural communities

Dr. Nelly Oelke, IHLCDP Associate and Assistant Professor in the School of Nursing, is leading a program of community-based research focused on improving services and supports for adults 50 and over with mental health concerns in the South Okanagan and Similkameen. The team includes representatives from Interior Health, community organizations, a community member and UBC researchers Dr. Carolyn Szostak and Jon Corbett. The team are currently using social network analysis, focus groups, and community meetings to explore and facilitate collaborations among participating organizations and set priorities for addressing needs of this target population.

Using exercise to fight frailty

Dr. Gareth Jones, Assistant Professor in the School of Health and Exercise Science, is leading research on the best ways to reverse frailty, the physiological decline many people experience as they get older.

Women from the community who were becoming frail were invited to the Healthy Exercise and Aging Laboratory (HEAL) on campus to complete a 12-week exercise program of functional resistance training and balance delivered by UBCO undergraduate and graduate students. The results showed that the exercise intervention was effective at reversing frailty. As one of the only frailty exercise research programs currently underway in Canada, Dr. Jones and his team are now testing whether a tailored, multi-component program of exercise can assist both pre-frail and frail adults. This research is profiled in this UBCO video

<https://www.youtube.com/watch?v=v2dgRWU9kL0&t=2s> Dr. Jones' interdisciplinary research team includes MSc students Nick Bray and Rowan Smart, Dr. Jennifer Jakobi (Associate Professor, Health and Exercise Science), Dr. Kathy Rush (Associate Professor, Nursing), and Dr. Charlotte Jones (Associate Professor, Medicine).



IHLCDP in the Community

Invited Academic Co-sponsor and member of the conference planning committee for the *Safe, Healthy, and Productive Workplaces: Learning from Research and Practice Conference* hosted by the Canadian Institute for the Relief of Pain and Disability. The conference will be held on UBC campus from June 1-3, 2017.

IHLCDP Activities by the Director

Member, Wellbeing at UBC Steering Committee, UBC

Member, Wellbeing at UBC – Okanagan Advisory Committee

Nominated Principal Investigator, Campus Health Development Grant (Ministry of Health/Interior Health), UBC Okanagan

UBC Representative, Interior Health Research Advisory Council

Member, National Board of Directors, Canadian Cancer Society (to Aug 2016).

Invited participant, *Best Brains Exchange on Masculinity and Male Suicide Prevention*, Hosted by Public Health Agency of Canada, CIHR, Mental Health Commission of Canada, Movember, and Men's Depression and Suicide Network. September 30, 2016, Ottawa, ON.

IHLCDP Advisory Committee

The IHLCDP Advisory Committee held two meetings during the year.

See Appendix B for a list of members.

IHLCDP Associates

The IHLCDP continues to welcome associates from the community and academia in its research activities. Currently the Institute has 68 associates. See Appendix C for a complete list.

Over the past year our UBC Okanagan IHLCDP Associates received over \$2.3 million in externally funded research grants. In addition, they have received prestigious awards and new positions. We highlight some of these achievements below:

- Dr. Mary Jung, Associate Professor in the School of Health and Exercise Science, was a recipient of the UBCO Health Researcher of the Year Award.
- Dr. Ali McManus, received a CFI and BCKDF award to establish the Paediatric Inactivity Physiology Laboratory at UBCO
- Drs. Kathleen Martin Ginis, Heather Gainforth, and Mary Jung in the School of Health and Exercise Science received a CFI award to establish the Centre for Translational Research in Behaviour Change for People with Chronic Conditions.
- Dr. Nelly Oelke, Assistant Professor, School of Nursing, is the new Academic Co-Lead BC Support Unit, Interior Centre at Interior Health providing co-leadership for the Centre including leadership on implementation science and assistance with patient engagement.

The work of our IHLCDP Associates has also been featured throughout the year on the UBC Okanagan website:

- Dr. Mary Jung: *Digital tools can motivate diabetics to exercise and eat well.* By Patty Wellborn, May 10, 2016. <https://news.ok.ubc.ca/2016/05/10/digital-tools-can-motivate-diabetics-to-exercise-and-eat-well/>
- Dr. Susan Holtzman: *Men who have sex with men in small cities less likely to be tested for HIV.* By Patty Wellborn, June 2, 2016. <https://news.ok.ubc.ca/2016/06/02/men-who-have-sex-with-men-in-small-cities-less-likely-to-be-tested-for-hiv/>
- Dr. Gareth Jones: *Exercise prescriptions could keep elderly out of hospitals.* By Patty Wellborn, September 21, 2016. <https://news.ok.ubc.ca/2016/09/21/exercise-prescriptions-could-keep-elderly-out-of-hospitals/>
- Dr. Mary Jung: *Fitness apps more effective when they are personalized.* By Matthew Grant, September 29, 2016. <https://news.ok.ubc.ca/2016/09/29/fitness-apps-more-effective-when-they-are-personalized/>
- Dr. Cristina Caperchione: *UBC researchers team up with Kelowna Rockets to support men's health.* By Patty Wellborn, October 20, 2016. <https://news.ok.ubc.ca/2016/10/20/ubc-researchers-team-up-with-kelowna-rockets-to-support-mens-health/>
- Dr. Heather Gainforth: *People trying to quit smoking don't always focus on tobacco cessation.* By Matthew Grant, October 25, 2016. <https://news.ok.ubc.ca/2016/10/25/people-trying-to-quit-smoking-dont-always-focus-on-tobacco-cessation/>
- Dr. Joan Bottorff: *UBC research aims to increase health of men in blue-collar jobs.* By Patty Wellborn, November 1, 2016. <https://news.ok.ubc.ca/2016/11/01/ubc-research-aims-to-increase-health-of-men-in-blue-collared-jobs/>
- Dr. Zach Walsh: *Marijuana could help treat drug addictions, mental health.* By Matthew Grant, November 26, 2016. <https://news.ok.ubc.ca/2016/11/16/marijuana-could-help-treat-drug-addiction-mental-health/>
- Dr. Marie Tarrant: *Pregnant women at risk of getting the flu are not getting vaccinated.* By Matthew Grant, November 22, 2016. <https://news.ok.ubc.ca/2016/11/22/pregnant-women-at-risk-of-getting-the-flu-are-not-getting-vaccinated/>
- Dr. Mary Jung: *Daily reminders to increase calcium intake are effective.* By Patty Wellborn, November 29, 2016. <https://news.ok.ubc.ca/2016/11/29/daily-reminders-to-increase-calcium-intake-are-effective/>
- Dr. Marie Tarrant: *New moms moving toward the bottle.* By Patty Wellborn, December 7, 2016. <https://news.ok.ubc.ca/2016/12/07/new-moms-moving-toward-the-bottle/>
- Dr. Jonathan Little: *Pumping iron is good for the heart, UBC researchers show.* By Christine Zeindler, January 11, 2017. <https://news.ok.ubc.ca/2017/01/11/pumping-iron-is-good-for-the-heart-ubc-researchers-show/>
- Drs. Jennifer Jakobi and Gareth Jones: *Hand-grip test can indicate decline in physical function of Parkinson's patients.* By Patty Wellborn, February 1, 2017. <https://news.ok.ubc.ca/2017/02/01/hand-grip-test-can-indicate-decline-in-physical-function-of-parkinsons-patients/>

- Dr. Kathy Rush: *Digital photography could be a key factor in rural health care*. By Patty Wellborn, February 9, 2017. <https://news.ok.ubc.ca/2017/02/09/digital-photography-could-be-a-key-factor-in-rural-health-care/>
- Dr. Zach Walsh: *Given the choice, patients will reach for cannabis over prescribed opioids*. By Christine Zeindler, February 27, 2017. <https://news.ok.ubc.ca/2017/02/27/given-the-choice-patients-will-reach-for-cannabis-over-prescribed-opioids/>
- Dr. Cristina Caperchione and Paul Sharp: *Even when given pedometers, university students don't make time to exercise*. By Patty Wellborn, March 7, 2017. <https://news.ok.ubc.ca/2017/03/07/even-when-given-pedometers-university-students-dont-make-time-to-exercise/>
- Dr. Carole Robinson: *Lack of adequate support a barrier for those wishing to die at home*. By Patty Wellborn, March 8, 2017. <https://news.ok.ubc.ca/2017/03/08/lack-of-adequate-support-a-barrier-for-those-wishing-to-die-at-home/>

Conclusion

Canada continues to face significant challenges in preventing chronic disease, with more than one in five Canadian adults living with a chronic disease that could largely be prevented. There is no doubt that research related to health promotion and supporting healthful lifestyles across the lifespan continue to be a priority. Over the past year, there has been significant growth in research programs addressing this need, and a parallel growth in interest from the wider community in our research. Together, these developments have provided unique opportunities for engaging communities and stakeholders in research partnerships, and extending our networks for knowledge sharing. In addition our expanding research programs are providing rich hands-on research training for both undergraduate and graduate students.

The Institute remains committed to supporting research teams by profiling their research through our seminar series and other activities, facilitating knowledge translation efforts, and expanding regional, national and international partnerships. Finally, we look forward to supporting efforts to intensify research collaborations to establish UBCO as a centre of excellence in health promotion and chronic disease prevention research that is relevant, accessible and useful.

Appendices

Appendix A IHLCDP Supporting Knowledge Exchange

IHLCDP Partnership in Research Series	
<i>Down on the farm: Understanding male farmers and mental health</i> Dr. Philippe Roy, University of Montreal	Monday, May, 30, 2016
<i>Playing to strength: Leveraging masculinities to promote men's physical activity and healthy eating</i> Ms. Megan Klitch, Canadian Cancer Society, BC and Yukon Division Dr. Cherisse Seaton, UBC Okanagan Dr. Joan Bottorff, UBC Okanagan	Wednesday, June 15, 2016
<i>If they build it, will they act? ProjectMOVE – a novel approach for increasing physical activity among breast cancer survivors</i> Dr. Cristina Caperchione, UBC Okanagan	Friday, October 14, 2016
<i>Do good things really come in small packages? Small Changes – A big idea to deal with the obesity epidemic</i> Dr. Lesley Lutes, UBC Okanagan	Thursday, January 26, 2017
<i>Assessing Social Return on Investment (SROI) in health promotion: Findings from the Healthy Together[®] Program</i> Ms. Stephanie Robertson, SiMPACT Strategy Group Dr. Anima Anand, The Bridge Youth & Family Services	Thursday, February 16, 2017
<i>The curious case of age related muscle fatigue: Keys to staying active and strong</i> Dr. Brian Dalton, UBC Okanagan	Friday, March 10, 2017
Research to Practice Seminars	
IHLCDP with North Okanagan Hospice Society	
<i>Indigenous Voices: Stories of serious illness and grief</i> Ms. Kali Leary, Métis & Inuit Cancer Control and the Underserved Populations Program, CancerCare Manitoba	Tuesday, November 15, 2016
<i>Dying at home: Enabling caregivers' determination</i> Dr. Carole Robinson, UBC Okanagan	Tuesday, January 24, 2017
<i>Giving voice to older people and family caregivers: A tablet-based tool to enhance person-centred palliative care</i> Dr. Rick Sawatzky, Trinity Western University	Tuesday, March 21, 2017
Campus-Community Partnerships for Rural Health	
IHLCDP with Interior Health Research Department	
<i>Aging at risk: The South Okanagan-Similkameen Rural Mental Health Project</i> Dr. Nelly Oelke, UBC Okanagan Ms. Tracy Janzen, Graduate student, UBC Okanagan Dr. Carolyn Szostak, UBC Okanagan	Wednesday, November 2, 2016

<i>Closing the gap in rural health care services: Exploring the entrepreneurial activities of citizen led coalitions</i> Dr. Kathy Rush, UBC Okanagan Dr. Mike Chiasson, UBC Okanagan Ms. Marilyn Clark, Sorrento Health Centre	Tuesday, January 17, 2017
<i>An asset-based community development approach to 'healthful aging' and care in rural communities</i> Dr. Denise Cloutier, University of Victoria Dr. Karen Kobayashi, University of Victoria Mr. Walter Popoff, Regional District of Central Kootenay	Tuesday, March 14, 2017
Other IHLCDP Events	
A Knowledge Exchange Webinar	Monday, May 2, 2016
MSFHR – Program Consultation	Wednesday, June 22, and Thursday, June 23, 2016
Citizen Series Webinar host site for BC Healthy Communities and Norther Health <i>Growing up Northern: Raising healthy children, families and communities</i>	Tuesday, June 28, 2016
A Visiting Scholar Event <i>Why might gender be important in the design and delivery of public health interventions?</i> Dr. Kate Hunt, University of Glasgow, Scotland	Thursday, September 8, 2016
A Visiting Scholar Event A win, win, win? Negotiating challenges, partnerships and public benefits in the development, evaluation and roll-out of public health interventions Dr. Kate Hunt, University of Glasgow, Scotland	Friday, September 9, 2016
An Embrace Aging Event <i>Savvy Seniors: New communication technologies and you</i> Facilitated by the Community Service Learning Program, UBC Okanagan	Wednesday, March 1, 2017
An Embrace Aging Event <i>Age of Love Movie – Vernon</i>	Wednesday, March 1, 2017
An Embrace Aging Event <i>Age of Love Movie – Kelowna</i>	Thursday, March 2, 2017
An Embrace Aging Event <i>Age of Love Movie – West Kelowna</i>	Friday, March 3, 2017
Celebrate Research Week <i>Rural health in rural hands: Building partnerships with a regional alliance for health research</i> Dr. Joan Bottorff, Dr. Judy Gillespie, Dr. Mike Chiasson, UBC Okanagan, and Betty Brown, Interior Health	Tuesday, March 7, 2017
An Embrace Aging Event <i>Seniors fraud protection tips – Kelowna</i> Interior Savings Credit Union	Tuesday, March 7, 2017

An Embrace Aging Event <i>MyHealthPortal: Interior Health electronic health records and you</i> Ms. Pamela Reese, Interior Health	Wednesday, March 8, 2017
An Embrace Aging Event <i>Sound of Music: A partnership to enhance lives</i> Baptist Housing	Wednesday, March 8, 2017
An Embrace Aging Event <i>Senior fraud protection tips – Vernon</i> Interior Savings Credit Union	Wednesday, March 8, 2017
Café Scientifique <i>Side stepping the effects of stroke</i> Ms. Jennifer Monaghan, Stroke Survivor Dr. Brodie Sakakibara, UBC Vancouver Dr. Andis Klegeris, UBC Okanagan Dr. Harry Miller, UBC Okanagan Ms. Jennifer Upshaw, PhD candidate, UBC Okanagan	Thursday, March 9, 2017
An Embrace Aging Event <i>Singing make everything better</i> Mr. Nigel Brown, Sing for your Life Canada Foundation BC	Monday, March 13, 2017
An Embrace Aging Event <i>Age of Love Movie – Oliver</i>	Tuesday, March 14, 2017
An Embrace Aging Event <i>Sleep: The key to healthy aging</i> Dr. Ronald Cridland, Kelowna Sleep Clinic	Wednesday, March 15, 2017
An Embrace Aging Event <i>Estate planning essentials: What you need to know – Vernon</i> Interior Savings Credit Union	Wednesday, March 15, 2017
An Embrace Aging Event <i>Estate planning essentials: What you need to know – Kelowna</i> Interior Savings Credit Union	Thursday, March 16, 2017
An Embrace Aging Event <i>Exercise: Putting the brakes on aging</i> Dr. Gareth Jones, UBC Okanagan	Wednesday, March 22, 2017
An Embrace Aging Event <i>Okanagan Men's Shed Open House: Building the well-being of men in the community</i>	Thursday, March 23, 2017
An Embrace Aging Event <i>Introduction to Pickleball</i> Pickleball Kelowna	Saturday, March 25, 2017
A Visiting Scholar Presentation <i>Date visualization and healthcare: Current trends and untapped potential</i> Dr. Uba Backonja, University of Washington	Thursday, March 30, 2017

Appendix B IHLCDP Advisory Committee

Betty Brown	Community Research: Lead, Interior Health Practice Office – Research Department
Linda Hatt	Associate Dean, Curriculum and Student Affairs, Irving K Barber School of Arts and Science, UBC Okanagan
Tracey Hawthorn	WRAP Coordinator, Human Resources, UBC Okanagan
Jennifer Jakobi	Associate Professor, School of Health and Exercise Sciences, Faculty of Health and Social Development, UBC Okanagan
Charlotte Jones	Southern Medical Program, Faculty of Medicine, UBC Okanagan
Glenn McRae	CNO and Professional Practice Lead, Interior Health
Roger Parsonage	Corporate Director, Population Health, Interior Health
Carole Robinson	Professor, School of Nursing, Faculty of Health and Social Development, UBC Okanagan
Edward Taylor	Associate Professor, School of Social Work, Faculty of Health and Social Development, UBC Okanagan
Paul van Donkelaar	Director, Professor, School of Health and Exercise Sciences, Faculty of Health and Social Development, UBC Okanagan

Appendix C IHLCDP Associates

Antifeau, Elisabeth	Helgason, Nial	McManus, Ali
Anton, Gayle	Hill, Trish	Oelke, Nelly
Berg, Stephen	Holder, Mark	Olsen, Lise
Brown, Betty	Holtzman, Susan	Parsonage, Roger
Bryant MacLean, Leslie	Hughes, Andrew	Penny, Tricia
Callaway, Robert	Jakobi, Jennifer	Pesut, Barbara
Campbell, Sarah	Jones, Charlotte	Plamondon, Katrina
Caperchione, Cristina	Jones, Gareth	Reid, Colin
Chau, Shirley	Jung, Mary	Robinson, Carole
Cook, Heather	Kjorven, Mary	Rush, Kathy
Corbett, Jon	Konnert, Joanne	Shahram, Sana
Dalton, Brian	Krank, Marvin	Shojania, Kam
Deegan, Heather	Kurtz, Donna	Smith, Michelle
Drewitz, Cheryl	Li, Eric	Taylor, Darlene
Evans, Michael	Little, Jonathan	Taylor, Dee
Filiatrault, Paul	Lovegrove, Gord	Taylor, Edward
Forneris, Tanya	Lutes, Lesley	van Donkelaar, Paul
Foster, Tracy	Maitland, Julie	Walsh, Zach
Gainforth, Heather	Maiwald, Karin	Wells, Susan
Ghosh, Sanjoy	Mallinson, Julian	Willis-Stewart, Sally
Hamilton, Casey	Marck, Patricia	Wilson, Roger
Hatt, Linda	Marcolin, Barb	Zebedee, Janelle
Hawthorn, Tracey	Marshall, Jamie	

Appendix D IHLCDP Personnel

Institute Administrative Support

Jacquetta Benard

Research Support

Gayl Sarbit, Knowledge Broker

Alex Cloherty, Research Assistant

Andrew Munroe, Knowledge Exchange Specialist

Anne Huisken, Research Assistant

Cherisse Seaton, Research Coordinator

Ian Newcombe, Research Assistant

Renee Toxopeus, Research Assistant

Work Study Research Assistants

Kennedy Amyotte, Undergraduate student

Alana Perusse, Undergraduate student

Himayini Sharma, Undergraduate student

Jackson Traplin, Undergraduate student

Campus Health Project

Casey Hamilton, Campus Health Specialist

Melissa Feddersen, Campus Health Specialist (to February 15, 2017)

Chelsey Hartwig, Campus Health Specialist (March 1, 2017 --)

UBC's Okanagan campus Graduate Students (supervised by the Director)

Katrina Plamondon, IGS PhD Student

Laura Struik, IGS PhD Candidate

2016/2017

APRIL

MARCH

ANNUAL REPORT

BRAES

Okanagan Institute for Biodiversity,
Resilience, and Ecosystem Services

braes.ok.ubc.ca

I. Walker



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

BRAES as a place of:

RESEARCH

BRAES is committed to producing world-class research that will distinguish UBC Okanagan as a place of excellence in the fields of biodiversity and environmental sustainability. We are continually striving to enhance our research capacity and impact, locally and globally. In so doing, we increase our ability to train, nurture and empower the next generation of leaders.

LEARNING

BRAES is a place of lifelong learning, creating opportunities for institute members and the broader community to engage in knowledge sharing activities. In addition, through its dedicated research facilities and organization of scientific activities, BRAES provides an enhanced training environment for undergraduate and graduate students.

ENGAGEMENT

BRAES values community engagement and non-academic partnerships as a means of leveraging the relevance and impact of our work. BRAES members have on-going collaborations with more than 50 government, non-government, community, and international organizations.

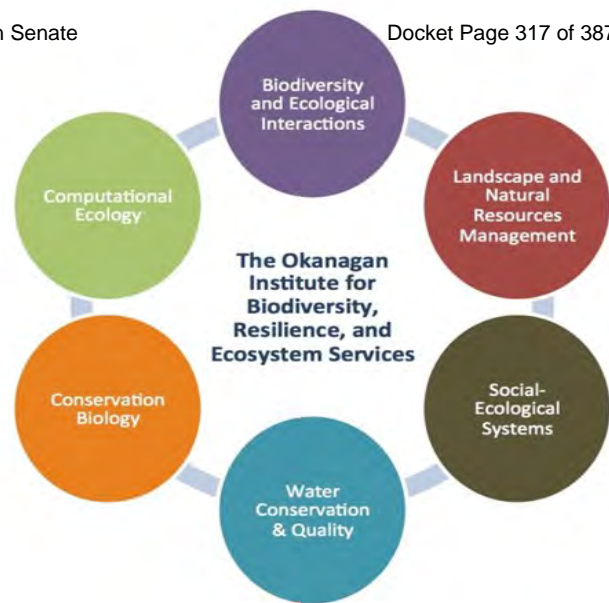
INTERNATIONALISM

BRAES aims to be a portal for global engagement, connecting our campus community to the world. Our members currently carry out research on seven continents, with active projects in places such as the Great Barrier Reef, the Galapagos Islands, the Nepalese Himalayas and the South African Succulent Karoo.

INNOVATION

Today's environmental challenges are wicked problems, for which no clear solution exists. By facilitating interdisciplinary collaboration, BRAES creates a place for ideas to incubate, leading to innovative outcomes that respond to the needs and imperatives of today's society.

BRAES at a Glance



30 faculty members

Over 150 student and postdoctoral trainees

6000 sq. ft. of dedicated research laboratory space

Numerous affiliated laboratories

\$3.0 million in research funding in 2016-2017

150 scientific publications in 2016-2017

Partnerships with more than 50 non-academic organisations



BRAES Highlights 2016-2017

L. Parrott

More than 10 MSc and PhD Graduates

More than 80 events including: research forums, research seminars, invited guest speakers, workshops, research group meetings and social events

Co-hosting conferences and events with partner organizations (e.g., Okanagan Research Forum)

More than 1500 attendees to BRAES events from the campus community and the general public

DVC sponsoring of 2 students to attend the **World Student Environmental Global Summit** in London, United Kingdom.

Web-streaming from UBC Vancouver of the **Biodiversity Seminar Series** organized by the Biodiversity Research Centre.

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BRAES Objectives and Directions 2017-2018



- Continuing to provide an enriched graduate training environment
- Submission of new collaborative research grants e.g. NSERC– CREATE: Resilient Ecosystems: Wildfire, ecology, education, disturbance. (FIREWEED)
- Seeking new sources of funding for BRAES operations
- Continued collaboration with UBC-V Biodiversity Centre (*Biodiversity Seminar Series, student co-supervision, graduate courses*)
- Increase the Institute's national and international visibility through improved communication materials (*website, brochure, newsletters & research profiles*)
- Continued high impact, regionally and globally relevant research

1. BRAES STRATEGIC DIRECTIONS



1.1 Vision

To advance efforts to protect species and ecosystems through interdisciplinary research, training and community engagement.

1.2 Mission

To conduct fundamental and applied research in biodiversity and conservation that has regional and international impact.

To become a leading international centre for the training of highly qualified undergraduate, graduate and postgraduate personnel. These researchers will be uniquely positioned to bridge disciplinary barriers to inform and guide effective conservation research and management strategies.

To foster strategic partnerships with First Nations, government, industry, and non-governmental organizations and to maintain active engagement with community stakeholders through educational outreach and stewardship activities.

1.3 Links with UBCO Research and Strategic Plans

Research activity at UBC's Okanagan campus is guided by two plans: Place and Promise: The UBC

Plan, which is a UBC-wide strategic plan, and The Strategic Research Support Plan,

specifically developed to guide research activity on the Okanagan campus. A new plan for 2017-2022 is currently under review.

The BRAES mission and vision are closely aligned with the 2009 UBC Okanagan Strategic Research Plan. The UBCO Strategic Research Plan emphasizes the importance of interdisciplinarity, partnerships and excellence in research, all demonstrated strengths of BRAES.

"Sustainable Environments and Populations" is noted as one of six Areas of Research Priority, specifically naming BRAES as an established entity of multidisciplinary strength to lead "research on environmental quality, adaptive responses and sustainable development (to) inform management and policy decisions that contribute to healthy environments for people and other organisms."

BRAES mission is also contributing to the UBC Strategic plan commitment of Research Excellence specifically with its goal of increasing the quality and impact of UBC's research and scholarship, participating in actions such as:

- Supporting and enhancing UBC researchers' grant funding competitiveness and success.
- Enhancing infrastructure to support leading edge research.
- Fostering UBC's globally influential areas of research excellence.

2. BRAES OPERATIONS



2.1 Governance

The VP Research at UBC Okanagan appoints the Institute Director who is a tenured Associate Professor or higher rank and who is presently a UBC Okanagan faculty member. The BRAES director reports to the VP Research.

The Director is responsible for coordinating the operations of BRAES, including its administrative staff and budget. The Institute has a Steering Committee that consists of the Director (Chair), the Deans of the Irving K. Barber School of Arts and Sciences (IKBSAS) and the Faculty of Creative and Critical Studies (FCCS), 3 or 4 faculty Institute members and 1 Graduate student member. Faculty steering committee members are elected by the membership for a 3 year period. The graduate student member is elected by other student members of BRAES for a 1 year term.

The Director supervises the Coordinator who is responsible for the day-to-day Institute activities and for planning, coordination, and communication within the Institute.

Current Steering Committee Members:

- Dr. Lael Parrott, Institute Director
- Dr. Michael Evans, Dean's delegate, IKBSAS.

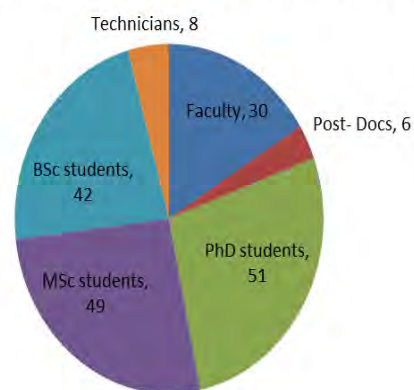
- Dr. Stephen Foster, Dean's delegate, FCCS.
- Dr. Greg Garrard
- Dr. Melanie Jones (study leave)
- Dr. Bob Lalonde
- Dr. Rebecca Tyson
- Graduate Student: Rachel Field
- Carolina Restrepo-Tamayo, Institute Coordinator

BRAES Lab Coordinator: Dr. Melanie Jones (Dr. Jones has been replaced by Dr. Louise Nelson while on study leave.)

2.2 Membership

As of March 2017 BRAES has 186 members distributed as follows: 30 Faculty Members, 6 Post-Doctoral Researchers, 51 PhD Students, 49 Masters Students, 42 Undergraduate Students and 8 Technicians (see Figure 1).

Fig. 1 : BRAES MEMBERS 2016-2017



Over the past year, 2 new faculty members along with their research groups have joined the Institute :

- Dr. Michael Deyholos, Irving K. Barber School of Arts and Sciences
- Dr. Adam Ford, Irving K. Barber School of Arts and Sciences

For a detailed list of faculty members please consult Appendix 1.

- Writing grants for BRAES and working with the Development Office to secure external funding for BRAES
- Developing and maintaining the BRAES web site
- Coordinating and preparing a quarterly BRAES newsletter.
- Developing an annual budget in collaboration with the institute director

2.3 Staff and Administration

The institute has a director who is appointed by the VP Research. Dr. Lael Parrott is the current director.

BRAES has a part-time coordinator who is responsible for planning, coordination, and communication within the BRAES Institute by:

- Organizing BRAES conferences, workshops, training sessions, retreats and annual general meetings.
- Preparing the Institute's annual activity reports
- Preparing budgets and forecasting requirements
- Facilitating collaborative agreements involving researchers, granting agencies and departments within the institute
- Promoting BRAES research to the broader community, in collaboration with university media relations officers
- Securing industry and other partners of BRAES for long-term collaborations

3. BRAES RESEARCH



3.1 Context

BRAES research has focused on identifying and managing species and habitats at risk, understanding and predicting biotic responses to environmental change, and sustaining resources and ecosystem services in natural and managed landscapes.

Our underlying motivation is to increase scientific understanding of ecological systems and to inform management and planning decisions that promote the preservation of biodiversity and ecosystem services in terrestrial, marine and aquatic systems.

BRAES members work from the genetic to landscape scales and use a wide range of field, laboratory and quantitative methods. BRAES facilitates multidisciplinary collaboration, leading to innovative research that transcends traditional approaches to ecology and conservation.

3.2 Research Themes

BRAES research falls under six inter-related themes (Figure 2).



FIGURE 2: BRAES RESEARCH THEMES

Conservation Biology

Conservation biology focuses on the identification and description of habitats necessary to support species at risk, and the development of scientific tools to support the conservation of these habitats. BRAES researchers use a range of tools to examine how species may respond to changing environments, habitat loss, and modified landscapes. The results of this research are applied to address the effectiveness of conservation laws and policies and to inform decision-makers on how best to conserve biodiversity in terrestrial, marine and freshwater ecosystems.

Landscape and Natural Resource Management

Research under this theme integrates ecology with human impacts on the landscape, searching for the most environmentally sustainable methods to use our natural resources. Projects include studying the impacts of forestry on forest hydrology and biodiversity, ecological restoration following human disturbances, modeling the impacts of land use change on key ecosystem services, advanced agro technology, and land use planning to sustain biodiversity.

Water Conservation & Quality

Water provisioning is a key ecosystem service on which humans depend and which is critical to supporting all terrestrial life-forms. Research in this area focuses on sustaining this ecosystem service by enhancing the quality of the terrestrial and aquatic environments that filter and modulate fresh water supplies. Projects include studies of ecotoxicology in aquatic ecosystems, water quality monitoring, and relationships between land use and water quality and availability.

Computational Ecology

Research in computational ecology combines quantitative methods with data to model and describe population and community dynamics in time and space. Methods range from statistical modeling of diversity and heterogeneity to the development of dynamic models using analytical or simulation-based approaches. These tools can be used to predict the effect of natural or human-caused disturbances on species and ecosystems or to predict the spatial spread of an invasive species across a landscape, for example. This theme reflects the strong links in BRAES between the mathematical and ecological sciences,

leading to development of innovative methods in environmental modelling and data analysis.

Social-Ecological Systems

This theme lies at the interface between the environment and society. The study of social-ecological systems relates to how humans shape and are reshaped by their natural environments, and includes the study of cultural perceptions of the environment. Research under this theme explores the nature of social-ecological resilience, adaptation of human communities to environmental change, and how cultural representations of nature influence human behavior.

Biodiversity and Ecological Interactions

This theme involves the study of the inter-relationships between biodiversity and ecosystem processes, from genetic to ecosystem and landscape scales. BRAES researchers working under this theme study diverse questions related to community assembly, invasive species, population dynamics and ecological connectivity, for example. A strong emphasis within this theme is on soil microbiology: understanding the contribution of mycorrhizal fungi and other micro-organisms to soil fertility and nutrient cycling in natural and agro-ecosystems. The fundamental work carried out under this theme provides the scientific foundation for conservation, restoration, and management efforts and for understanding relationships between biodiversity and ecosystems services provisioning.

3.3 Record of Publications, Students and Research Funding 2016-2017:

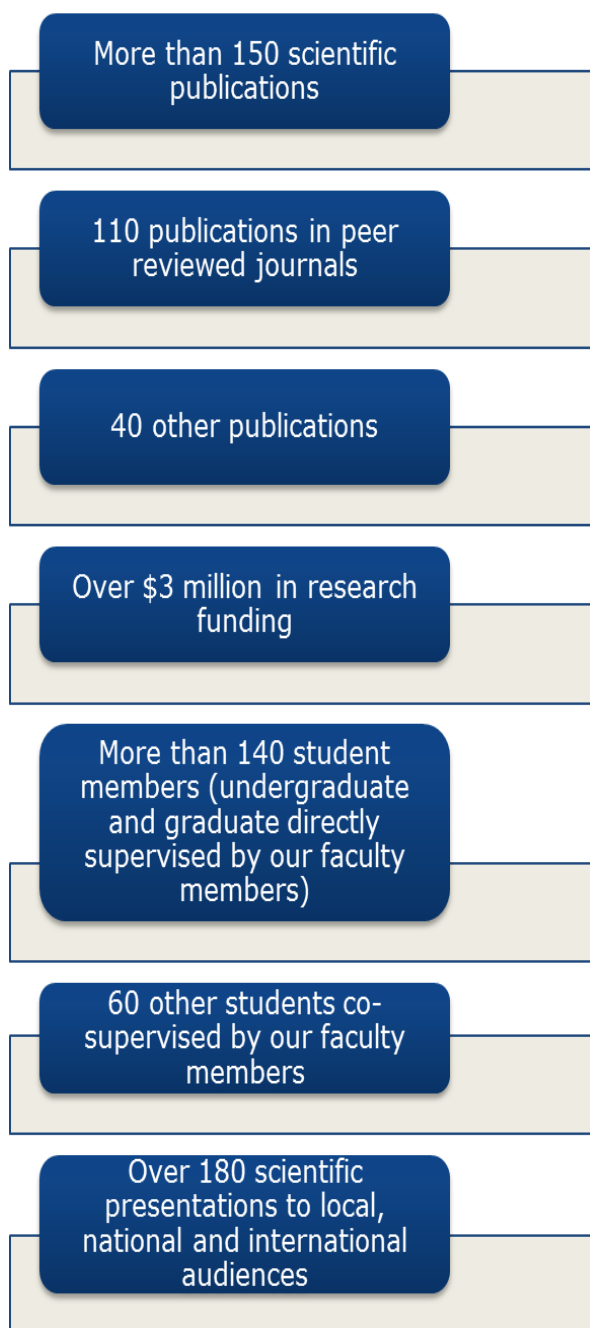


FIGURE 3: BRAES RESEARCH RECORDS
2016-2017

See Appendix 2 for a selected list of publications

3.4 Space and existing resources

A CFI grant was secured in 2004. This helped support the construction of the 3rd floor of the Science Building, including about 6000 square feet of BRAES laboratory facilities that are equipped with state-of-the-art instrumentation. More specifically, the facilities include:

- Molecular Lab
- PCR Product Room
- DNA Sequencing Room
- Prep Room
- Clean Cold Room
- Dirty Cold Room
- Equipment Room
- Dirty Ecology Lab
- Microscope Room
- Culture Room
- Computing/GIS Room
- Physiology Lab
- Radiation Lab

These facilities are being used by BRAES members to conduct their research and to accomplish the BRAES mission. BRAES members have been very productive in 2015-2016 with about 150 publications and over \$3.0 million in grant funding. This level of productivity would not be possible without the facilities.

3.5 Partnerships

BRAES values partnerships within the University and with government, non-government, community, and international organizations. Partnerships include activities such as joint

research projects, funding agreements, student supervision, dissemination or application of research.

Below, we list a few of the groups with whom we have established collaborations:

Within The University of British Columbia:

- Okanagan Sustainability Institute (Okanagan)
- BC Regional Innovation Chair in Water Resources and Ecosystem Sustainability (Okanagan)
- Beatty Biodiversity Research Centre (Vancouver)
- Centre for Applied Conservation Biology (Vancouver)

Canadian governmental agencies:

- Environment Canada
- Canadian Wildlife Service
- Parks Canada
- Agriculture Canada
- BC Ministry of Forest, Lands and Natural Resources Operations
- BC Parks
- Canadian Food Inspection Agency
- Department of Defense
- City of Armstrong
- Natural Resources Canada
- Regional District of Central Okanagan
- City of Kelowna
- District of Lake Country
- Okanagan Basin Water Board
- BC Ministry of Agriculture
- Canadian Department of Fisheries and Oceans

International governmental agencies

- US National Park Service
- US National Forest Service
- Montana Fish, Wildlife and Parks
- US Department of Agriculture
- L'Institut National de la Recherche Agronomique (France)

Non-governmental entities:

- Island Conservation
- Okanagan Basis Water Board (OBWB)
- BC Wildlife Federation
- Conservation Northwest
- Okanagan Collaborative Conservation Program (OCCP)
- South Okanagan Similkameen Conservation Program (SOSCP)
- Wildlife Conservation Society
- American Museum of Natural History
- Water Stewardship Council
- Nature Trust of BC
- Get to Know FORREX
- Great Northern Landscape Conservation Cooperative
- British Columbia Institute of Agrology Okanagan Chapter

Industrial partners:

- Tolko
- Tree Fruit Growers Association Dobson Engineering Ltd.
- Summit Environmental
- Summerhill Winery
- Ecoscape Environmental Consultants Ltd.

3.6 Interdisciplinary Research

BRAES researchers work in a range of environments and locations around the globe. They maintain active affiliations with many partner organizations, including government ministries and NGOs. BRAES is committed to promoting research partnerships and carrying out interdisciplinary research that will directly inform environmental policy and management decisions.

Affiliated research groups and laboratories:

- Biodiversity and Landscape Ecology Research Facility
- Complex Environmental Systems Laboratory
- The Ecological and Conservation Genomics Lab
- Fragment Analysis and DNA Sequencing Services (FADSS)
- Forest and Mycorrhiza Ecology & Ecophysiology Research Group
- Soil Microbial Ecology Group

Vertebrate Conservation Discussion Group

The group is formed by: Dr. Karen Hodges, Dr. Michael Russello and Dr. Jason Pither and their lab members. This group meets weekly from September through April. Kirsten Lawson and TJ Gooliaff, graduate students with Dr. Karen Hodges, did a fantastic job coordinating the meetings this year.

Computational Ecology Research Group

The group is formed by: Dr. Lael Parrott, Dr. Rebecca Tyson, Dr. Robert Lalonde, Dr. Jason Pither and their lab members. The group meets weekly through the academic year.

Soil Microbial Ecology Group

The group is formed by: Dr. Louise Nelson, Dr. Melanie Jones, Dr. Dan Durall, Dr. Miranda Hart, Dr. John Klironomos and their lab members.

3.7. Research Groups within BRAES

Our Institute has formed thematic research groups that meet every week to present their recent work, to discuss research papers of interest, or to have invited guests present their work.

The current groups are:

4. BRAES ACTIVITIES



4.1 Speaker Series, Seminars, Workshops, Conferences and Forums

4.1.1. BRAES partners in the classroom speakers series

This speaker series brings BRAES' non-academic partners to campus to speak about the work they do and the challenges and issues they face in their professions. The talks are held during scheduled undergraduate class times so that our undergraduate students have the opportunity to interact with scientists and practitioners working in non-academic environments. All BRAES members and the general public are also invited to attend. An informal networking session follows each talk to facilitate discussion and interaction with the speaker.

4.1.2 Distinguished Guest Speakers

BRAES hosts 2-3 distinguished scientists per year to speak on environmental topics of broad interest. The guest stays on our campus for about a week to have the opportunity to interact and meet with our members, and deliver a public talk.

4.1.3 Research Seminars

In addition to our distinguished speakers series, BRAES organizes research seminars, where other academics visiting our campus present their research to our members and the campus community.

4.1.4 Workshops Series

The series includes a succession of workshops that are offered during the school year on relevant topics of interest to researchers in the university community and BRAES partner organizations.

4.1.5 Biodiversity Research Seminar Series streaming from the Biodiversity Research Centre in Vancouver

In January 2016, BRAES began a partnership with the UBC Biodiversity Research Centre to stream to our campus their renowned Biodiversity Research Series. Every Wednesday at noon the Centre hosts invited researchers in biodiversity to speak in the Beaty Auditorium at the UBC Biodiversity Museum. From September 2016 through April 2017, we were able to stream from UBC Vancouver 23 presentations and we had 2 live presenters in Kelowna that were streamed into the Beaty Auditorium. Based on this success, we will continue working together with the Biodiversity Research Centre for the 2017-2018 season.

4.1.6 Okanagan Research Forum



The Okanagan Research Forum: Building a Resilient Okanagan Landscape, was hosted by the UBC Institute for Biodiversity, Resilience, and Ecosystem Services (BRAES) and the UBC Institute for Community Engaged Research (ICER), in collaboration with partner organizations on December 5th, 2016. The Forum encouraged knowledge sharing and dialogue between UBC Okanagan Researchers and the broader community, including government and local organizations. Every two years, a Forum will be organized with a specified theme. This year's theme was resilience, a particularly relevant topic for the Okanagan

region considering the pressures we face due to climate change, population growth, and changes in land use.

The Okanagan Research forum is a new featured event that ICER and BRAES will put together every two years and replaces the Okanagan Water and Biodiversity Forum that happened in 2014.



4.1.7 WSEN Conference



For the second consecutive year, during the summer of 2016 two BRAES students represented our campus at the World Student Environmental Global Summit that took place in the United Kingdom.

After the Summit, BRAES and the Office of the Deputy Vice Chancellor hosted a reception to present the results of our member's participation in that event.

Our two representatives to the conference were selected via merit based on their proposal for the conference. The two students were:

- Jenna Hutchen, MSc Student with Dr. Karen Hodges.
- Carmen Chelick, MSc Student with Dr. Jason Pither.

We thank the Office of the Deputy Vice Chancellor for their financial support that has enabled our students to participate in this international conference.

4.1.8 BRAES Posters Session

The BRAES posters session is a new event that was launched in March 2017, as part of Celebrate Research week. During this event our members had the opportunity to present posters of their research to the University community. This year the event was hosted in the third floor of the Science Building where all our labs are located. The event was very successful and we hope to repeat this event in 2018.

4.1.9 BRAES Social Events

Once or twice a year our institute hosts a social event where all our members have the opportunity to share stories and successes in an environment different than the research one. Last year BRAES hosted one social event at the end of April.

Table 1: Summary of BRAES Events, 2016-2017

BRAES EVENTS 2016-2017							
Year	Date	# of Events	Speaker	Type of Event	Event Name	Attendant	Virtual
2016	Sep-29	1	Various	BRAES- BCIA Partnership	What does a career in Agrology looks like?	35	
2016	Oct-17	1	BRAES Students attending WSEN	Social Event	WSEN Wine and Cheese	55	
2016	Oct-27	1	Peter Guttorp, Intergovernmental Panel on Climate Change	Distinguished Guest Speaker	The Heat is On!	260	
2016	Nov-28	1	Antonio del Campo, Visiting professor University of Valencia	Classroom Speaker Series	Managing Forests for Water and Enhanced Climate Resilience	45	
2016	Nov-30	1	Michael Bonsall, University of Oxford	Distinguished Guest Speaker	Spatial ecology: the role of Allee effects and stochasticity on species persistence	35	45
2016	Dec-05	1	Various see list Attached	Okanagan Research Forum	Building a Resilient Okanagan Community	105	
2016	Dec-05	1	Kyle Pows Whyte, Michigan State University	Distinguished Guest Speaker	Community Resilience: The Perspective of an Indigenous Environmental Activist	50	
2017	Mar-03	1	BRAES Members	Posters Session	Celebrate Research Week: BRAES Posters Session	45	
2017	Mar-30	1	Jennifer Ruesink, University of Washington	Distinguished Guest Speaker	Linking functional diversity to the ecological valuation of habitat	35	50
2016-2017		25	Various, see list attached	Biodiversity Seminar Series		305	
2016-2017		24	Computational Ecology Research Group (CERG)	Research Group Meetings		192	
2016-2017		24	Vertebrates Research Group	Research Group Meetings		245	
		82	Events		Sub totals	1407	95
					TOTAL	1502	

Attendance to BRAES events in 2016-2017 increased from the previous year by almost 50%

4.2 Outreach Activities



BCIA- BRAES Partnership: What does a Career in Agrology Look Like?

This event was hosted at UBC Okanagan on September 29th and included presentations by professional Agrologists. Our members had the opportunity to network with B.C. institute of Agrologists (BCIA) members and shared experiences about work experience, careers etc.

Website, Poster, Newsletter

The Institute has an active website that is updated regularly with new information and activities. The website can be found here: <http://BRAES.ok.ubc.ca/>

BRAES Outreach at a Glance

BRAES members were involved many other activities such as conference presentations, invited talks, meetings and workshops, media interviews and publications among others:

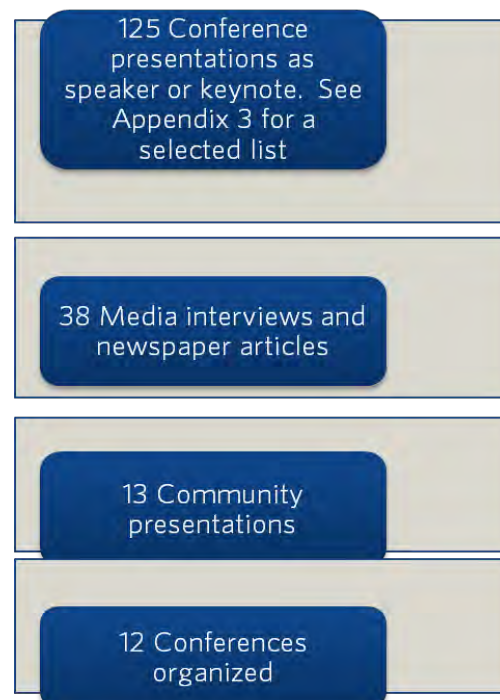
Outreach Activities:

BRAES, as stated in its goals, is working more and more with non-academic partners. During 2016-2017 BRAES co-hosted several events with partner organizations, including:

BRAES—ICER— City of Kelowna—BC Wildlife Federation and OBWB Partnership; Okanagan Research Forum

The nature of this event was described in the BRAES activities section, however, this event was our most important outreach activity this year, with more than 150 attendees in total. The event took place on December 5th, 2016 at the Kelowna Yacht Club.

The Forum Program is provided in Appendix 4 .





Okanagan Research Forum



Poster Sessions



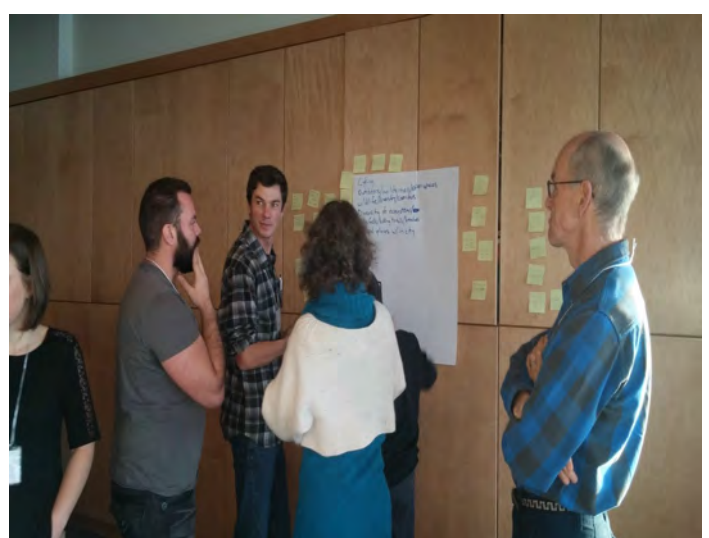
Social Events



Collaborations



Research Groups Meetings



Activities with Partners

5. BRAES CONTACT INFO

For general information or inquiries about BRAES,
please visit our website at:
<http://braes.ok.ubc.ca/> or contact:

Dr. Lael Parrott

Director, the Okanagan Institute for Biodiversity,
Resilience, and Ecosystem Services

Tel: 250-807-8122

Email: lael.parrott@ubc.ca

Or

Carolina Restrepo-Tamayo

Coordinator, The Okanagan Institute for
Biodiversity, Resilience, and Ecosystem Services

Tel: 250-807-9023

Email: carolina.restrepo@ubc.ca

APPENDIX 1: BRAES FACULTY MEMBERS

- John Braun, Arts and Sciences
- Sylvie Desjardins, Arts and Sciences
- Aleksandra Dulic, Creative and Critical Studies
- Michael Deyholos, Arts and Sciences
- Daniel Durall, Arts and Sciences
- Sylvia Esterby, Arts and Sciences
- Adam Ford, Arts and Sciences
- Greg Garrard, Creative and Critical Studies
- Kevin Hanna, Arts and Sciences
- Miranda Hart, Arts and Sciences
- Karen Hodges, Arts and Sciences
- Nancy Holmes, Creative and Critical Studies
- John Janmaat, Arts and Sciences
- Melanie Jones, Arts and Sciences
- Laura Hooker, Arts and Sciences
- John Klironomos, Arts and Sciences
- Robert Lalonde, Arts and Sciences
- Karl Larsen Thompson Rivers University
- Bruce Mathieson, Arts and Sciences
- Susan Murch, Arts and Sciences
- Louise Nelson, Arts and Sciences
- Lael Parrott, Arts and Sciences
- Michael Pidwirny, Arts and Sciences
- Jason Pither, Arts and Sciences
- Scott Reid, Arts and Sciences
- Michael Russello, Arts and Sciences
- Rebecca Tyson, Arts and Sciences
- John Wagner, Arts and Sciences
- Ian Walker, Arts and Sciences
- Adam Wei, Arts and Sciences

APPENDIX 2: BRAES SELECTED LIST OF PUBLICATIONS

A selected list of our member's publications can be requested from our Coordinator

APPENDIX 3: BRAES SELECTED LIST OF PRESENTATIONS

A selected list of our member's presentations can be requested from our Coordinator.

APPENDIX 4: Okanagan Research Forum Program

Building a Resilient Okanagan Community

December 5th, Kelowna Yacht Club

WELCOME



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THE UNIVERSITY OF BRITISH COLUMBIA

Okanagan Institute for Biodiversity,
Resilience, and Ecosystem Services
(BRAES)



INSTITUTE FOR
COMMUNITY
ENGAGED RESEARCH



*Imagine*Kelowna

26 | BRAES 2016/2017 ANNUAL REPORT



Okanagan Basin
WATER BOARD



9 a.m. - 5 p.m.

8:30 — 9:00 a.m. **Coffee and registration**

9:00 — 9:15 a.m. **Welcome—Opening prayer**

JON CORBETT, UBC Okanagan

LAEL PARROTT, UBC Okanagan

LUKE STACK, City of Kelowna

SESSION 1: SETTING THE STAGE

9:15—10:30 a.m. **I Moderator: Nelson Jatel,**

Okanagan Basin Water Board

Panelists:

Jordan Coble, Westbank First Nation

John Janmaat, UBC Okanagan

Brigitte Le Normand, UBC Okanagan

Lael Parrott, UBC Okanagan

Anna Warwick Sears, OBWB Executive Director

10:30 — 10:45 a.m. **Break**

SESSION 2: ECOLOGICAL RESILIENCE

10:45 a.m.—12 p.m. **I Moderator: Melissa Tesche**

Okanagan-Kootenay Sterile

Insect Release Program

Panelists:

Carolyn Callaghan , Canadian Wildlife Federation

Grant Furness, B.C. Ministry of Forests, Lands and Natural Resources Operations

Jason Pither, UBC Okanagan

Lisa Wilson, Okanagan Nation Alliance

12:00 — 1:00 p.m. **Lunch**

SESSION 2: HUMAN AND SOCIAL RESILIENCE

10:45 a.m.—12 p.m. **I Moderator: Jon Corbett,**

UBC Okanagan

Panelists:

Glenda Cooper, City of Kelowna

Greg Garrard, UBC Okanagan

Paul Sharp, City of Kelowna

Mary Stockdale, UBC Okanagan

SESSION 4: VISION FOR OKANAGAN LANDSCAPE

2:15—3:30 P.m. **I Moderators:**

Lael Parrott, UBC Okanagan

Jon Corbett, UBC Okanagan

3:30 — 3:45 p.m. **Break**

POSTERS SESSION— WINE AND CHEESE

3:45 —5 p.m.

EVENING SPEAKER

6:45 - 8:30 p.m.

6:45 — 7:00 p.m. **Coffee and registration**

7:00 — 7:10 p.m. **Welcome**

Wisdom Tettey, UBC Okanagan

KEYNOTE PRESENTATION

7:10—8:30 p.m. **I Dr. Kyle Pows Whyte**

Michigan State University

Community Resilience: The Perspective of an Indigenous Environmental Activist

THANK YOU

A sincere thank you to all sponsors, presenters, delegates and volunteers who have contributed to making the Okanagan Research Forum possible. Success will be achieved as we continue to share ideas and work together to actionable solutions for our region.

Okanagan Campus,
3333 University Way
Kelowna, B.C. Canada V1V 1V7
Tel. 250.807.8000
www.ok.ubc.ca



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THE UNIVERSITY OF BRITISH COLUMBIA

Okanagan Institute for Biodiversity,
Resilience, and Ecosystem Services
(BRAES)



May 2017 update of the Regional Socio-Economic Development Institute of Canada (RSEDIC)

RSEDIC was created in 2015 to connect with communities, both locally and internationally. Its purpose is twofold:

1. To impact regional economies, and
2. To provide interdisciplinary research and training opportunities for faculty and graduate students.

RSEDIC houses a number of active interdisciplinary research projects, and is involved in major cross-campus initiatives. 2016-2017 was a busy year for RSEDIC, with the institute now positioned for growth in 2017-2018.

Research Activities

RSEDIC houses three major research initiatives, and all three have seen significant activity during the 2016-2017 academic year.

1. Positioning the BC Wine Industry for International Growth

Working with KEDGE Business School (Bordeaux, France) since Fall 2012, colleagues from UBC's Okanagan campus have been engaging the British Columbia wine industry on its strategic development. The group of colleagues organizing the project are: Kim Buschert (UBC Library/Faculty of Management); Malida Mooker, Roger Sugden and Marcela Valania (UBC Faculty of Management); Jacques Olivier Pesme (KEDGE Business School, Bordeaux, France).

In 2015, Western Economic Diversification Canada provided \$630,000 funding as part of a \$1.3M project over three years (2015-2018), to enable the institute to support the emergence of British Columbia as a global wine region. Plans for this funding included organizing an industry task force on wine labeling and presentation, establishing a task force on the industry's identity, analyzing intelligence that the industry gathers from international trade shows, using research and industry knowledge to identify and assess options for the industry's organization, and modelling from advanced wine regions in the world.

A notable initiative was the introduction in 2014 of the annual UBC-KEDGE Wine Leaders Forum, which offers winery owners and principals an independent and

challenging arena for open participation, free expression and collective learning. There have now been four Wine Leaders Forums, with the 2017 forum recently held April 23-26 in Naramata, BC. The 2017 forum saw participation grow to 14 winery participants, with the primary outcome an agreed-upon list of tasks and action items to be shared between participating wineries and the industry more widely.

A major achievement in 2016 was the completion of the task force on wine labelling, which had significant impact on the wine industry. Following dissemination of the final report by the task force (see Appendix 1), the recommendations were taken up by industry representatives and used to stimulate discussion and industry deliberations. Based on these deliberations, recommendations were forwarded by the Canadian Vintners Association to the Minister of Agriculture and Agri-Food.

In 2017, the project team was also awarded \$19,115 from the Social Sciences and Humanities Research Council (SSHRC) under the Connection Grant program for a dissemination project entitled “British Columbia as a Wine Territory: Catalyzing Shared Understanding of its Identity” (see Appendix 2, summary of project). The project team successfully set up the initial exhibition at the 2017 Wine Leaders Forum, and the exhibition will now be broken into four parts and distributed across BC wineries, including: Okanagan Crush Pad, Painted Rock Estate Winery, Summerhill Pyramid Winery, and Tinhorn Creek Vineyards. The exhibition at the wineries will be available between the busy tourist months of May – August. In September, the exhibition will be brought back together for a final display at the Penticton Public Library, which will run alongside a speaker’s series on the wine industry and its impact on regional socio-economic development. The project employs a graduate student research assistant from the department of Creative Studies, and is providing training in community and industry outreach and engagement.

2. Occupational structure in the Okanagan Nation Territory

This project is a cross-campus and inter-university research project focused around the role that the history of occupational structure plays in the development of regional economic strategies. An initial workshop was held in June 2016, with a follow-up scheduled for June 2017 (see Appendix 3, workshop attendees 2016-2017).

A forthcoming issue of *BC Studies* will include the first publication out of this research collective, “Economic Development of Interior British Columbia: A Case Study of Occupations in the Okanagan, 1881-1921” (Sugden and Sugden, 2017). A follow-up presentation, “Economic Development of Interior British Columbia: A Case Study of Wages in the Okanagan 1911-21” was presented at the Economic History Society Annual Conference, Royal Holloway, London, April 2017; and a refined version will be given at the Canadian Network of Economic History sessions at the Canadian Economics Association Annual Conference, Antigonish, June 2017.

In late 2016, the Occupations initiative received \$4955 in funding from UBC’s internal Humanities and Social Sciences grant program for a small project, “The History of

Occupations of Okanagan First Nation Men and Women” (see Appendix 4, summary of project). The project supports a part-time undergraduate research assistant in History/Indigenous Studies.

\$10,000 of RSEDIC funds have been allocated for 2017 toward expanding this project in partnership with Snecwips Heritage Museum, in Westbank.

3. Socio-technical change and regional economic development

In 2016, a UBC Okanagan faculty contingent (including RSEDIC director, Sugden) travelled to Germany and the Netherlands to discuss partnerships with the German Aerospace Centre and the Technical University of Delft. This trip precipitated the development of an emerging cluster of researchers around the development and deployment of technology with a concern for shaping and impacting the regional socio-economic development of rural and remote communities.

In February 2017, an application was submitted to Western Economic Diversification Canada to support a post-doctoral fellow to undertake a comprehensive study of the industry potential and economic impact of developing and deploying small-scale electric airplanes in Western Canada (see Appendix 5, summary of project). This project is the first attempt to formalize what is developing as an innovative interdisciplinary methodology around a specific case study (“Clean Flight” – see Appendix 6). The WD application had the full support of all Deans on UBC’s Okanagan campus. If successful, this project will also result in an application for an NSERC Connect grant in the fall of 2017 to support a workshop dedicated to building a cross-sectoral consortium. It is also envisaged that the clean flight initiative will be foundational for a SSHRC Insight grant application to be submitted in October 2017.

Cross-campus initiatives

1. Community-University portal

The primary cross-campus initiative supported by RSEDIC in 2016-2017 has been the planning and initial development of a Community-University portal to support research, student learning, and community engagement (see Appendix 7, summary of project). The portal project is a joint-initiative between RSEDIC and the Institute for Community Engaged Research (ICER) with the support of the UBC Okanagan library. The project team – Jon Corbett (ICER Director), Roger Sugden, Heather Berringer (Chief Librarian, UBC’s Okanagan campus), and Mary Butterfield (Faculty of Management Research Coordinator) – has successfully applied for \$25,000 of internal funding, and \$5000 of RSEDIC funds have been allocated to this project for 2017. The project has recruited a community-based advisory committee to oversee the development of the portal, and construction of the tool is scheduled to begin in July 2017. The project team submitted an application for further funding (\$25,000) for the project to the Canadian Internet Registration Authority in March 2017.

2. 2017 RSEDIC Seed Grant

The Strategic Research Support Plan for UBC's Okanagan campus prepared by the Vice Principal Research (2017) has outlined a process for the allocation of resources through the UBC Excellence Fund. This process includes funding in support of research cluster development on campus, and identifies six thematic areas and two cross-cutting strategic domains that will receive priority for funding. Regional socio-economic development has been identified as one of the cross-cutting themes, and in an effort to stimulate research activity in this area, RSEDIC launched a seed grant competition in early 2017 (see Appendix 8, RSEDIC Seed Grant program terms). The competition closed April 18, 2017, and funding decisions are expected by the end of May, 2017. These funded projects will be featured on RSEDIC's website, and will be the focus of an RSEDIC workshop in the fall of 2017. \$22,000 of RSEDIC funding has been allocated to the seed grant competition in 2017.

Membership

RSEDIC membership has remained static since its formation in 2015. The primary administrative goal for RSEDIC in 2017 is to re-engage and expand the membership, beginning with an AGM to be held later in 2017. This AGM will include updates on activities to date, and a strategic planning session to co-create goals for the Institute moving forward. Opportunities to be explored include establishing a speaker's series, engaging with other research institutes based at UBC's Okanagan campus for further joint-initiatives, and the preparation of a plain-language report on socio-economic research on UBC's Okanagan campus for local, regional and provincial stakeholders.

Attachments

- Final report and recommendations of the task force of labeling and presentation
- Appendix 1: Summary of SSHRC Connection grant "British Columbia as a Wine Territory: Catalyzing Shared Understanding of its Identity"
- Appendix 2: Occupations workshop attendees 2016-2017
- Appendix 3: Summary of UBC Okanagan Humanities and Social Sciences grant "The History of Occupations of Okanagan First Nation Men and Women"
- Appendix 4: Summary of Western Economic Diversification application "Clean Flight"
- Appendix 5: Socio-Technical Change and Regional Socio-Economic Development brief
- Appendix 6: Summary of Community-University Portal project
- Appendix 7: RSEDIC Seed Grant program terms



FINAL REPORT AND
RECOMMENDATIONS
OF THE
TASK FORCE ON LABELLING AND
PRESENTATION

Roger Sugden and Jacques-Olivier Pesme
May 2016





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FOREWORD

The international partnership between the University of British Columbia (UBC) in the Okanagan, Canada, and KEDGE Business School in Bordeaux, France, is intended to critically appreciate and support development of the British Columbia wine industry by bringing to bear the capabilities of universities.

This report is an output of the Task Force on Labelling and Presentation struck as part of the UBC-KEDGE project, *Position the British Columbia Wine Industry for International Growth*, which is supported by Western Economic Diversification. The aim of the project is to organize knowledge so as to help the industry to position itself internationally; in particular, so as to understand what would be required for British Columbia to emerge as a globally recognized wine region and, if industry actors so choose, so as to help them achieve that standing.

The task force comprised volunteers from wineries across British Columbia, who determined the principal areas it should concentrate upon. The report includes a summary of the task force development and its work, and presents recommendations from the industry participants.

A handwritten signature in black ink, appearing to read "J. Pesme".

Jacques-Olivier Pesme
Director, Wine and Spirits Academy
KEDGE Business School, Bordeaux, France

A handwritten signature in black ink, appearing to read "Roger Sugden".

Roger Sugden
Dean, Faculty of Management
Advisor to the Principal on Innovation and Economic
Development
University of British Columbia, Canada



ACKNOWLEDGEMENTS

We would like to especially acknowledge the contribution of the members of the British Columbia wine industry who participated in the task force.

Thanks to those from the industry and wider community who took the time to take part and share their observations in the UBC-KEDGE town hall meetings and the 2016 Wine Leaders Forum.

This report would not have been possible without the contribution of Kim Buschert. We would also like to thank Kim Partanen, who provided research support, and Malida Mookan and Marcela Valania for their valuable comments and suggestions.



EXECUTIVE SUMMARY

In November 2015 the Task Force on Labelling and Presentation was struck, as part of the UBC-KEDGE Wine Industry Collaboration project, *Position the British Columbia Wine Industry for International Growth*, supported by Western Economic Diversification. The task force carried out its main work from December 2015 to March 2016.

The task force committed to engage with industry stakeholders to provide recommendations about labelling and label architecture, including the specification of origin on labelling, for all wines that are produced by wineries in BC, both those containing 100% BC grown grapes and others, for the purposes of growing international and domestic markets.

Two fundamental, inter-related points stood out in task force discussions, at town halls and at the 2016 Wine Leaders Forum:

1. Participants agreed that accuracy about origin in labelling is crucial for a wine region to be taken seriously on an international level, and that British Columbia needs to meet international standards for stating country of origin.
2. They also expressed a desire to ensure clarity in labelling and to avoid misleading consumers in both international and domestic markets.

Participants emphasized that the interim measure in the CFIA guidance allowing use of the term, "Cellared in Canada" is problematic and could stand in the way of the industry adhering to standards such as that of the International Organisation of Vine and Wine (OIV), of providing clarity in labelling and of achieving global recognition.

As a result of these concerns, the task force recommendations focus on exploring actions regarding the interim measure and joining OIV.

The industry members of the task force recommend:

1. That the following options be put to all members of the industry for it to choose amongst regarding the statement "As an interim measure, the statement 'Cellared in Canada' by (naming the company), (address) from imported and/or domestic wines'



may also be used as a country of origin statement for wines blended in Canada" in the CFIA guidance on Labelling Requirements for Alcoholic Beverages:

- a. Maintenance of the status quo
 - b. Removal with immediate effect
 - c. Transition to removal
2. That the industry support the removal of the statement "As an interim measure, the statement 'Cellared in Canada' by (naming the company), (address) from imported and/or domestic wines' may also be used as a country of origin statement for wines blended in Canada" from the CFIA guidance on Labelling Requirements for Alcoholic Beverages
3. In the event that the industry opts for (1)(c), above, that the transition be determined through an inclusive process across all types of wineries in British Columbia
4. That the options be chosen amongst in a recorded vote covering all types of wineries in British Columbia
5. That the industry pursue the possibility of participation in OIV



INTRODUCTION

The wine industry globally has seen the arrival of new producers and the opening of new markets for consumption. Such changes mean that wineries in British Columbia are facing tougher competition. These challenging times require adaptation to new practices, and understanding of new trends and markets.

One of the critical factors in building the foundations of a successful wine industry in any region internationally is the labelling of the region's wines, and in particular the specification of origin on labelling.

In this context, in November 2015 the Task Force on Labelling and Presentation was struck, as part of the UBC-KEDGE Wine Industry Collaboration project *Position the British Columbia Wine Industry for International Growth*, supported by Western Economic Diversification (WD), and following the UBC-KEDGE Industry Collaborative earlier that month.¹

The task force committed to engage with industry stakeholders to provide recommendations about labelling and label architecture, including the specification of origin on labelling, for all wines that are produced by wineries in BC, both those containing 100% BC grown grapes and others, for the purposes of growing international and domestic markets.

The task force carried out its main work from December 2015 to March 2016. Participants determined the principal areas it should concentrate upon, and developed sub-groups to focus on chosen aspects of labelling, and on strategies for communicating with industry and other stakeholders.

This report includes a summary of the task force development and its work, and presents recommendations from the industry participants. The report will be provided to individual wineries across British Columbia, wine industry associations and other interested parties, and

¹The UBC-KEDGE Wine Industry Collaborative is held over 2 days in November of each year. It provides an opportunity for debriefing and questioning by not only wine producers but also all others with an interest in the industry.



federal and provincial ministries and departments responsible for wine labelling and wine industry policy.

TASK FORCE OBJECTIVE AND COMPOSITION

Setting up the task force was first proposed and agreed to at the April 2015 UBC-KEDGE Wine Leaders Forum² by the participant winery owners and principals from diverse segments of the industry. It was then incorporated into the UBC-KEDGE Wine Industry Collaboration project *Position the British Columbia Wine industry for International Growth*, supported by Western Economic Diversification.

The terms and composition of the task force were discussed and agreed to by participants at the November 2015 UBC-KEDGE Wine Industry Collaborative. The complete Terms, including the objective, composition and principles are included in Appendix A: Terms of Reference and Composition. The Terms were circulated to the BC wine industry along with the call for participants; they were also circulated to those industry members who attended the town halls that were held as part of the task force activities (as outlined below).

OBJECTIVE

As described in the Terms of Reference and Composition, the purpose of the task force is “to provide recommendations about labelling and label architecture, including the specification of origin on labelling, for all wines that are produced by wineries in BC, both those containing 100% BC grown grapes and others, for the purposes of growing international and domestic markets.”

(The labelling task force established as part of the UBC-KEDGE project was acknowledged to be separate from, and complementary to, the BC Wine Appellation Task Group. The latter has

² The annual UBC-KEDGE Wine Leaders Forum was established in 2014. Held over 4 days in April each year, the Forum is designed to offer a safe, yet challenging retreat-style arena for discussion of the wine industry’s strategic concerns. It brings together winery owners and principals, international wine management expertise, government representatives, and other concerned parties.



published a statement that while of interest to the industry, International-Canadian blend (ICB) wines were not in the scope of the Appellation Task Group, and ICB wines, among other issues, may be discussed by a group facilitated by UBC-KEDGE.³⁾

COMPOSITION

The task force comprised volunteers from wineries across BC. Owners or principals able to reflect a winery's perspective and approach were encouraged to volunteer, via email invitation sent out to the UBC-KEDGE distribution list. The target was to select up to 15 industry participants, with representation from large (3), medium (4) and small (6) wineries; an additional 2 seats were allocated to ensure geographic representation if needed.

12 participants were selected: 6 small winery participants volunteered, so all were selected; 4 participants from medium wineries were randomly selected from the volunteers; and the 2 volunteer participants from outside the Okanagan were selected to ensure geographical representation. No participants were put forward from large wineries; however, ongoing discussions with them resulted in the task force being offered access to information and research. The 3 seats allocated to large wineries were kept open for them, should they choose to join at a later date. See Appendix B for the list of task force participants.

As described in the Terms, in addition to winery participants, Roger Sugden - Dean of UBC's Faculty of Management - was chair, and Jacques-Olivier Pesme - Director of the Wine & Spirits Academy, KEDGE Business School, Bordeaux - was advisor. The UBC-KEDGE project team provided additional support for information collection, dissemination and logistics.

³BC Wine Appellation Task Group, "ICB Statement," accessed May 18, 2016 from <http://bcwinetaskgroup.ca/icb-statement/>. This statement is referred to in Appendix 2, page 42 of the BC Wine Appellation Task Group report, *Wine Industry Turning Point: Recommended Changes to the British Columbia Wines of Marked Quality Regulations*, April 2016, accessed May 18, 2016 from <http://bcwinetaskgroup.ca/wp-content/uploads/2016/04/BC-Wine-Appellation-Task-Group-Report-Amended-April-2016.compressed.pdf>.



TASK FORCE ACTIVITIES

The task force held meetings in November, December, January and March. Participants attended by telephone or in person. At these meetings the group agreed to the terms of reference put forward by industry participants at the November 2016 UBC-KEDGE Wine Industry Collaborative. They also organized themselves into sub-groups to consider chosen aspects of labelling, and communications to winery and other industry stakeholders. Further, they determined a process for engagement across the industry for sharing information and gathering feedback.

LABELLING FOCUS

Through discussion, the task force confirmed that statements of origin on labels were of particular interest to them. Furthermore, industry participants wanted to understand the regulations governing origin statements, both provincially and federally, to learn about existing international standards, and to review other work completed in Canada on this subject.

To this end, the UBC-KEDGE project team prepared and circulated a backgrounder for the task force which includes a review of the scope of the British Columbia Wines of Marked Quality regulation, a summary of key Canadian Food Inspection Agency (CFIA) guidance on origin terms for wine and products other than wine, and an overview of the Organisation of Vine and Wine International Standards. The backgrounder is provided in Appendix C: Backgrounder on Labelling Requirements for Origin Statements.

COMMUNICATION OF TASK FORCE WORK

At the January meeting the task force reviewed the key information. Participants wanted to disseminate findings as they pertained to regulations across the industry, so as to share the knowledge and gauge response to the material, and to collect input to be considered for the development of recommendations. It was determined that holding town hall meetings would



be the best way to reach industry representatives, and that findings should also be presented at the 2016 UBC-KEDGE Wine Leaders Forum.

TOWN HALLS

6 town halls were scheduled for the week of February 29th to March 4th as follows:

Date/Time	Location
Monday, February 29 2:30pm - 4:00pm	Kelowna Okanagan Regional Library
Tuesday, March 1 10:30am - 12:00pm 2:30 pm - 4:00pm	Osoyoos Walnut Beach Resort Penticton Penticton and Wine Country Chamber of Commerce
Wednesday, March 2 2:30pm - 4:00pm	Webinar
Thursday, March 3 10:30am - 12:00pm	Duncan Cowichan Green Community
Friday, March 4 2:30pm - 4:00pm	Keremeos The Grist Mill

Invitations were sent to the UBC-KEDGE distribution lists for wineries and others with an interest in the wine industry. The task force requested that industry associations promote the town halls to their members.

For the purposes of the town halls, the pertinent information on origin statements for labels that had been collated into the above described and appended backgrounder document was distributed to all town hall attendees. The backgrounder was also distributed widely to the



industry following the town halls, with an invitation to provide written feedback via email. In addition, for the town halls the UBC-KEDGE project team created and delivered a presentation summarizing the information in the backgrounder and providing an overview of the WD supported project.

In total, 40 individuals attended the town halls, including representatives from 27 wineries (not including task force participant wineries). Other attendees included consultants, and representatives from BC winery associations and the provincial government.

2016 UBC-KEDGE WINE LEADERS FORUM

The town hall presentation was adapted (the overview of the WD supported project was removed, and themes from the town halls added) and presented on April 5 at the 2016 Wine Leaders Forum. Additional feedback was gathered from Forum participants, to inform task force recommendations.

SUMMARY OF FINDINGS

The following is a summary of the findings collated in the backgrounder document that was provided to the industry at the town halls and via email. The full document is included in Appendix C.

BC REGULATIONS

The Wines of Marked Quality regulation (currently part of the Agri-Food Choice and Quality Act, which will be replaced in 2018 by the Food and Agricultural Products Classification Act⁴) outlines criteria for the use of geographical indications for BC wine. BC wine regulations do not cover internationally blended wine that is produced in BC, nor do they regulate the use of

⁴Canada. British Columbia. Ministry of Agriculture. *Providing consumers certainty when buying B.C. organic products*, 2016. <https://news.gov.bc.ca/releases/2016AGRI0004-000212>. Bill 11 - 2016 received Royal Assent on March 10, 2016 (<https://www.leg.bc.ca/parliamentary-business/legislation-debates-proceedings/40th-parliament/5th-session/bills/progress-of-bills>).



the “Cellared in Canada” statement on labels. The Canadian Food Inspection Agency (CFIA) provides federal guidelines in these areas.

FEDERAL REGULATIONS AND GUIDANCE

CFIA defines the terms Product of Canada and Made in Canada, and provides guidance specifically for wine. Country of origin statements are required for wine. The name of the country should be used if the wine comprises at least 75% juice from grapes grown in that country. If it does not, the label must include the names of countries from which the grapes or juice or wine originate.

An additional term is permissible: “as an interim measure, the statement ‘Cellared in Canada by (naming the company), (address) from imported and/or domestic wines’ may also be used as a country of origin statement for wines blended in Canada.”⁵ According to a CFIA communiqué to the Canadian Vintner’s Association in 2001, the “interim measure” was agreed to in 1994 by industry associations, grape growers and the CFIA, pending development of a national standard for wine.⁶

WINE COUNCIL OF ONTARIO

In 2009, the Wine Council of Ontario Industry Working Group on Label Clarity recommended that CFIA permit the use of “Blended from International and Canadian Wines” in place of Cellared in Canada.⁷

⁵Canada. Canadian Food Inspection Agency, “Country of Origin for Wine,” *Labelling Requirements for Alcoholic Beverages*, accessed May 17, 2016, <http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/alcohol/eng/1392909001375/1392909133296>.

⁶Email response to UBC-KEDGE by an officer of CFIA, January 29, 2016.

⁷Wine Council of Ontario, *Improving Clarity for the Consumer*, 2009.



INTERNATIONAL STANDARD

The Organization of Vine and Wine (OIV) produces an International Standard for the Labelling of Wine, which is a “recommendation” to its 46 member states. The standard specifies that country of origin is compulsory information for wine made from grapes grown and vinified in that country, wine vinified in a different country from where the grapes originated, or wine blended from wines of different countries. Further, for blended wines, “in all cases, the countries must be displayed in decreasing order of the proportions of the assemblage.”⁸

FOCUS OF DISCUSSIONS IN THE TASK FORCE, AT TOWN HALLS AND AT THE UBC-KEDGE WINE LEADERS FORUM

Two fundamental, inter-related points stood out in the task force discussions, at the town halls and at the 2016 Wine Leaders Forum:

1. Participants agreed that accuracy about origin in labelling is crucial for a wine region to be taken seriously on an international level, and that British Columbia needs to meet international standards for stating country of origin.
2. They also expressed a desire to ensure clarity in labelling and to avoid misleading consumers in both international and domestic markets.

Participants emphasized that the interim measure in the CFIA guidance is problematic and could stand in the way of the industry adhering to standards such as that of OIV, of providing clarity in labelling and of achieving global recognition.

As a result of these concerns, the task force recommendations focus on exploring actions regarding the interim measure and joining OIV.

⁸The International Organisation of Vine and Wine, *International standard for the labelling of wine*, 2015, accessed May 18, 2016 <http://www.oiv.int/public/medias/2618/oiv-wine-labelling-standard-en-2015.pdf>.



CONCLUSIONS

The principal conclusion from the task force deliberations is that, if British Columbia wishes to be recognized globally as an international wine region, then it needs to meet international expectations on labelling and geographical origin, and whilst the current CFIA regulations are largely in line with those expectations, the interim measure in the CFIA guidance is not.

Participants in the task force clearly recognize that the task force is made up of very few members of the industry. Accordingly, the aim of the report is to put into the public realm considerations for wider discussion and possible action across the entire industry, if the industry so chooses. Indeed, further action might include industry wide discussions at suitable venues organized by appropriate industry bodies.

RECOMMENDATIONS

The industry members of the task force recommend:

1. That the following options be put to all members of the industry for it to choose amongst regarding the statement "As an interim measure, the statement 'Cellared in Canada' by (naming the company), (address) from imported and/or domestic wines' may also be used as a country of origin statement for wines blended in Canada" in the CFIA guidance on Labelling Requirements for Alcoholic Beverages:
 - a. Maintenance of the status quo
 - b. Removal with immediate effect
 - c. Transition to removal
2. That the industry support the removal of the statement "As an interim measure, the statement 'Cellared in Canada' by (naming the company), (address) from imported and/or domestic wines' may also be used as a country of origin statement for wines blended in Canada" from the CFIA guidance on Labelling Requirements for Alcoholic Beverages



3. In the event that the industry opts for (1)(c), above, that the transition be determined through an inclusive process across all types of wineries in British Columbia
4. That the options be chosen amongst in a recorded vote covering all types of wineries in British Columbia
5. That the industry pursue the possibility of participation in OIV

POST SCRIPT: INDUSTRY INITIATIVES INDEPENDENT OF THE TASK FORCE

At the time of writing this report, representatives of the industry and others, independently of the Task Force on Labelling and Presentation organized as part of the UBC-KEDGE project, prior to the release of the task force recommendations, have made calls for the removal of the interim measure, albeit at the initiative of and with support from some task force participants. These calls include:

OPEN LETTER TO THE BCWI BOARD OF DIRECTORS

In March 2016, and without the involvement of UBC-KEDGE, a letter requesting that the BCWI support an active campaign for the removal of the interim measure was circulated for wineries to sign at a BCWI town hall.

UBC-KEDGE WINE LEADERS FORUM OUTCOMES

As an outcome of the 2016 Wine Leaders Forum, representatives of the 11 participating wineries decided to:

- Request that the BCWI board ask the minister for CFIA to put in place an 18 month sunset period on removal of the interim measure in the CFIA guidance on Labelling Requirements for Alcoholic Beverages - *"As an interim measure, the statement 'Cellared in Canada' by (naming the company), (address) from imported and/or domestic wines' may also be used as a country of origin statement for wines blended in Canada"* - and in which there will be federal stakeholder industry consultations on application of the existing regulations.



- To our knowledge, this request was brought as a motion to the BCWI board meeting on Monday, April 11th, which was carried.
- Draft a letter to MPs Dan Albas and Stephen Fuhr to request that the Library of Parliament create a report on the OIV, to be shared with other like-minded MPs and from which information will be shared with Wine Leaders Forum participants, potentially leading to a request for a full parliamentary committee study.

ENGAGING THE FEDERAL GOVERNMENT

On April 12, 2016, and also without the involvement of UBC-KEDGE, MP Michelle Rempel read a statement in the House of Commons, urging the standing committee on agriculture to study the effectiveness and impact of the interim measure. She had submitted a letter to this effect to the Chair of the Standing Committee on Agriculture and Agri-Food on April 11. The letter refers to the likelihood of recommendations to change the interim measure as a result of the collaborative project between UBC and the BC wine industry.

These actions were followed by a Twitter discussion on 'truth in labelling' under the #BCWineChat and #ONWineChat threads on April 20.

In addition, three British Columbia winery representatives traveled to Ottawa on April 18, to meet with interested Members of Parliament to request support of the Standing Committee review.

A website, <http://truthinlabelling.ca> was launched for people to petition the government to end the interim measure.⁹ At time of writing, it was not clear how many individuals had signed the petition.

⁹ "truthinlabelling.ca," accessed May 25, 2016, <http://truthinlabelling.ca/>.



APPENDICES

APPENDIX A: TASK FORCE TERMS OF REFERENCE AND COMPOSITION

Task Force on Labelling and Presentation: Terms of Reference and Composition

Objective

To provide recommendations about labelling and label architecture, including the specification of origin on labelling, for all wines that are produced by wineries in BC, both those containing 100% BC grown grapes and others, for the purposes of growing international and domestic markets

Indicative questions for the task force to consider*

- What, if anything, must be mentioned about origin on labels?
- What, if anything, must be avoided on labels?
- Is it necessary to introduce or reinforce regulations?
- Does compulsory information need to be created?

* The task force through its operation will determine the actual set of questions that it will address

Principles of operation

The task force needs to:

- Engage flexibly with the industry across BC
- Be proactive in engaging with and going to interested parties, e.g. regional associations
- Focus on using reason and evidence:
 - Listen
 - Challenge
- Be committed to reaching consensus, subject to reason and evidence

Process to determine industry participants

- Request volunteers from the wineries across BC to participate in the task force, given the principles
- Volunteers need to be winery owners or principals or those in a position to reflect a winery's perspective and approach
- Select up to 13 participants from industry volunteers:
 - Up to 3 from large wineries



- Up to 6 from small wineries, randomly selected from volunteers
- Up to 4 from medium wineries, randomly selected from volunteers

If the number of volunteers in a size category is less than the number of participants allowed for in that category, select everyone that volunteers.

Volunteers may designate one alternate, who must be specified at the first meeting.

- In addition, Jacques-Olivier Pesme and Roger Sugden may select up to 2 additional participants from the volunteers, at their discretion, if there were otherwise to be an absence of geographical representation

Composition and roles

- The task force will comprise:
 - Up to 15 industry participants as determined by the above selection process
 - Jacques-Olivier Pesme (advisor) and Roger Sugden (chair)
- Ultimate responsibility for report drafting lies with Jacques-Olivier Pesme and Roger Sugden, in accord with the principles

Task force support

- Task force meeting logistics, including providing remote access options, documentation, and information support (collating data, literature reviews, etc. as needed) provided by Kim Buschert (project coordinator)
- Travel funding support for task force participants
- Privileged access to the April Wine Leaders Forum for task force participants

Task force timeline and estimated time commitment

- *September 2015 - October 2015* Data collection by UBC-KEDGE project team, including through online surveys and telephone interviews; analysis of data
- *2 and 3 November 2015* Wine Industry Collaborative on labelling and presentation task force
- *Week of 23 November* First task force meeting (remote or in-person, 90 minutes), to review and confirm terms of reference, and to discuss indicative questions and information collection process
- *Week of 14 December* Task force meeting (remote or in-person, 60 minutes), to refine indicative questions, set work plan and schedule



- *January 2016 - February 2016* Engagement by the task force across the entire industry, as determined by the task force; for example, small delegations meeting with regional associations, etc.
- *Week of 26 January 2016* Face-to-face meeting of the task force (1/2 day), for task force participants to exchange and deliberate initial findings
- *Week of 29 February 2016* Meeting of the task force (remote or in-person), to exchange findings and consider initial draft recommendations for inclusion in report
- *March 2016* Initial draft of task force report produced
- *April 2016* Initial draft of report discussed at Wine Leaders Forum
- *May 2016* Final report disseminated for action across the industry

APPENDIX B: LIST OF WINERY TASK FORCE PARTICIPANTS

Evelyn Campbell, Blasted Church Vineyards	Spencer Massie, Clos Du Soleil
Ezra Cipes, Summerhill Pyramid Winery	Sandra Oldfield, Tinhorn Creek Vineyards
Penelope Furt-Roche, Roche Wines	Severine Pinte, Le Vieux Pin Winery/Lastella Winery
Andy Gebert, St. Hubertus & Oak Bay Estate Winery	Joanna Schlosser, Niche Wine Company
Andy Johnston, Averill Creek Vineyard	Bruce Schmidt, Intersection Estate Winery
Curtis Krouzel, 50th Parallel Estate	John Skinner, Painted Rock Estate Winery



APPENDIX C: BACKGROUNDER ON LABELLING REQUIREMENTS FOR ORIGIN STATEMENTS



LABELLING REQUIREMENTS - ORIGIN Backgrounder

Prepared by the Task Force on Labelling and Presentation
For the purposes of industry consultation
February 2016



Labelling Requirements for Origin Statements: Backgrounder

1. Introduction and Purpose

This backgrounder is intended to summarize British Columbia legislation, federal regulations and international standards relating to labelling of wine, specific to statements of origin. This document will be used for discussion purposes by wineries, grape growers and other interested industry participants. The Task Force on Labelling and Presentation, set up as part of the UBC-KEDGE led project, *Position the British Columbia Wine Industry for International Growth*, supported by Western Economic Diversification, will gather comments and suggestions from industry participants. These will be used to inform recommendations which will be provided by the task force to federal and provincial ministries and departments responsible for wine labelling and wine industry policy, as well as to wine industry associations.

2. British Columbia Legislation

a. BC Wine Act

The BC Wine Act was repealed on April 29th 2011, and has been replaced by the Agri-Food Choice and Quality Act under which the Wines of Marked Quality Regulation falls. Wine labelling requirements for BC VQA and BC wines of distinction are covered within this regulation.

b. Agri-Food Choice and Quality Act

Part 1 (section 3) of the Agri-Food Choice and Quality Act outlines its "Quality Programs" and the guidelines around prescribed words on labels. The section states a certificate holder "may use a prescribed word, name, phrase, symbol, label, mark or form of packaging, in accordance with the regulations and any conditions attached to the certificate, to describe, identify, label, advertise or market the person's agri-food product."

The regulation referred to is the Wines of Marked Quality Regulation, which is an agri-food quality program, and the certificate mentioned is either a practice standards certificate for



wineries, and/or a wine quality certificate for wines. The Act itself doesn't comment any further on wine labeling as this information is contained within the regulation.

c. Wines of Marked Quality Regulation

Section 27 of the Wines of Marked Quality Regulation outlines the criteria for use of geographical indications for BC Wine, and Section 28 covers specific geographical indications and their use.

To use 'British Columbia or other BC geographical indications, wine must consist of 100% BC grapes. To use indications other than British Columbia, i.e., Golden Mile Bench, 95% of the grapes must be from the Golden Mile Bench.

In November 2015, the BC Appellation Task Group released its report, which includes recommendations regarding changes to the Wines of Marked Quality regulation. New sub-appellations and requirements for recognition as BC wine are part of the recommendations.

The Wines of Marked Quality regulation does not cover the use of 'Cellared in Canada', nor does it offer indications for internationally blended wine that is produced and sold in BC. Label indications for these wines fall under federal guidelines regulated by the Canadian Food Inspection Agency (CFIA).

Sources:

BC Wine Act, R.S.B.C c. 39 (1996). Retrieved from
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96039_01

Agri-Food Choice and Quality Act, S.B.C. c. 20 (2000). Retrieved from
http://www.bclaws.ca/civix/document/id/complete/statreg/00020_01#section3

BC Wines of Marked Quality Regulation (2005). Retrieved from
http://www.bclaws.ca/civix/document/id/complete/statreg/79_2005



3. CFIA Labelling Requirements

a. "Made in Canada" and "Product of Canada"

According to the Canadian Food Inspection Agency (CFIA), there is a definite distinction between the terms "Product of Canada" and "Made in Canada."

In order for a food item to be labelled "Product of Canada," virtually all of its ingredients have to be Canadian. For wine to be labelled a "Product of Canada" it has to consist of at least 75% Canadian grapes and/or juice.

Made in Canada is essentially something that has been changed into a new product in Canada with contents obtained elsewhere, or a combination of Canadian and foreign products with a manufacturing connotation.

Product of Canada is something that contains ingredients from Canada. For something to be labelled a product of Canada, the percentage of foreign ingredients has to be insignificant (less than 2%).

The guidelines defining these two terms were established in 2008, to "help Canadians make informed choices about the products they are purchasing," whether they are looking for products with significant amounts of Canadian ingredients, or if they want to know their purchase has been produced to Canadian standards.

Furthermore, to promote consistency, using these two terms is preferred over other terms. However, other terms such as "Roasted in Canada," "Packaged in Canada," "Distilled in Canada" or "Processed in Canada" are permitted, "provided that they are not false or misleading."

Use of these terms is optional - but once used, the product must meet the conditions of the guidelines.

Country of origin for wine is covered under mandatory labelling requirements for specific products.



b. Country of Origin for Wine

A "clear indication of the country of origin" is mandatory for wine labels.

To claim to be "of a country," the wine must meet one of two conditions. From the labelling requirements:

- a) the wine is made from at least 75% of the juice of grapes grown in that country and it is fermented, processed, blended and finished in that country, or
- b) in the case of wines blended in that country, at least 75% of the finished wine is fermented and processed in that country from the juice of grapes grown in that country.

If the above conditions for country of origin are NOT met, the label must "describe the various origins," for example:

- "Made in Canada from (naming the country or countries) grapes (or juices)" or
- "Blended in Canada from (naming the country or countries) wines"

An additional declaration is allowable, "as an interim measure":

the statement "Cellared in Canada by (naming the company), (address) from imported and/or domestic wines" may also be used as a country of origin statement for wines blended in Canada.

The interim measure allowing the Cellared in Canada declaration was added in 1994, and was approved by industry associations, grape growers and the CFIA. The purpose of this statement was to meet the mandatory labelling requirements, until a National Standard of Canada was developed.

As of a 2001 CFIA communication to the Canadian Vintners' Association, the standard had not yet been completed; therefore, the interim statement remained in effect (email response to UBC-KEDGE by an officer of CFIA, Jan. 29, 2016). At time of writing for this backgrounder, no Canadian standard covers wine labels. The standard, CAN/CGSB-177.1-96 included label requirements, but has been withdrawn.



In 2009, the Wine Council of Ontario Industry Working Group on Label Clarity recommended that CFIA permit the use of "Blended from International and Canadian Wines" in place of Cellared in Canada (Wine Council of Ontario, 2009).

Sources:

Canadian Food Inspection Agency. (n.d.). *Origin claims. Guidelines for "Product of Canada" and "Made in Canada" claims.* Retrieved from

<http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/origin/eng/1393622222140/1393622515592?chap=5>

Canadian Food Inspection Agency. (n.d.). *Origin claims. Additional information.* Retrieved from <http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/origin/eng/1393622222140/1393622515592?chap=6#s9c6>

Canadian Food Inspection Agency. (n.d.). *Labelling Requirements for alcoholic beverages. Country of origin for wine.* Retrieved from

<http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/alcohol/eng/1392909001375/1392909133296>

Wine Council of Ontario. (2009). Improving clarity for the consumer.

Standards Council of Canada. (1996). *Wine.* (CAN/CGSB-177.1-96). Retrieved from <https://www.scc.ca/en/standardsdb/standards/6339>

4. International Organisation of Vine and Wine (OIV) - International Standard for Labelling Wines

The OIV consists of 46 member states from around the world. It produces resolutions, technical standards, best practice guidelines, statistics and analyses, which are available through its website, www.oiv.int.

The International Standard for the Labelling of Wines, 2015 edition is "a recommendation from the OIV to the Member States. Its aim is to ease international exchange and to ensure fair information to consumers" (OIV, 2015).



The standard's General Measures section states, "Labelling must include compulsory information to which optional information can be added." Furthermore, it forbids any content relating to origin that is misleading. (OIV, 2015).

Section 2.5 specifies that country of origin is compulsory information for wine made from grapes grown and vinified in that country, wine vinified in a different country from where the grapes originated, or wine blended from wines of different countries.

Section 4.7 covers how the country of origin may be presented.

- For blended wines: "blend of wines from..."
- For wine vinified from grapes of another country: "wine produced in ... from grapes harvested in..."
- Comparable phrases may be used for the above.
- However "in all cases, the countries must be displayed in decreasing order of the proportions of the assemblage."

Sources

The International Organisation of Vine and Wine. (n.d.) *Member states and observers*. Retrieved February 12, 2016 from <http://www.oiv.int/en/international-organisation-vine-and-wine/member-states-and-observers>

The International Organisation of Vine and Wine. (2015). *International standard for the labelling of wine*. Retrieved from <http://www.oiv.int/js/lib/pdfjs/web/viewer.html?file=/public/medias/2618/oiv-wine-labelling-standard-en-2015.pdf>



BIBLIOGRAPHY

BC Wine Appellation Task Group. "ICB Statement." Accessed May 16, 2016,

<http://bcwinetaskgroup.ca/icb-statement/>

BC Wine Appellation Task Group. *Wine Industry Turning Point: Recommended Changes to the British Columbia Wines of Marked Quality Regulations*. 2016. Accessed May 18, 2016,

<http://bcwinetaskgroup.ca/wp-content/uploads/2016/04/BC-Wine-Appellation-Task-Group-Report-Amended-April-2016.compressed.pdf>

Canada. British Columbia. Ministry of Agriculture. *Providing consumers certainty when buying*

B.C. organic products, 2016. <https://news.gov.bc.ca/releases/2016AGRI0004-000212>

Canada. Canadian Food Inspection Agency. "Country of Origin for Wine." *Labelling*

Requirements for Alcoholic Beverages. Accessed May 17, 2016,

<http://www.inspection.gc.ca/food/labelling/food-labelling-for-industry/alcohol/eng/1392909001375/1392909133296>

International Organisation of Vine and Wine, *International standard for the labelling of wine*,

2015. <http://www.oiv.int/public/medias/2618/oiv-wine-labelling-standard-en-2015.pdf>

"Truthinlabelling.ca." Accessed May 25, 2016, <http://truthinlabelling.ca/>

Wine Council of Ontario, *Improving Clarity for the Consumer*, 2009

PROJECT SUMMARY

The wine industry in British Columbia (BC) has a major economic impact - approximately 300 wineries contribute over 10,000 jobs and \$2 billion to the province. Yet this impact would be significantly greater if the wine region did not suffer from a lack of territorial cohesion, i.e. little sense of being a wine territory with its own identity. To help address this issue, our overarching goal is to mobilize both research and industry knowledge relevant to the development of BC as a wine territory, so as to catalyze shared understanding of the territory's identity

This will be achieved through a visual exhibition that showcases knowledge about how people in the industry perceive themselves and their relationships with each other, their relationships with the land and wider environment, and other distinct features of BC as a wine territory. The exhibition will be presented in wineries and a public library, and be complemented by a series of public talks. There will also be poster displays in libraries across the province, aimed at fostering widespread engagement amongst the industry, citizens and visitors to the region.

The project is a collaborative endeavour amongst academic researchers at the University of British Columbia (UBC), KEDGE Business School (Bordeaux, France) and Open University (UK), and wineries and libraries in BC. Exhibition materials include photographs, artefacts, and other visual representations that reflect both academic research on the BC wine industry, and the perspectives of winery owners and other individuals and organizations associated with the industry.

The exhibition will be presented in three phases. Phase I is at the 2017 UBC-KEDGE Wine Leaders Forum, which is a retreat for British Columbian winery owners and principals that will be hosted in April 2017 as part of a \$1.3 million initiative supported by Western Economic Diversification Canada, intended to help BC emerge as a globally recognized wine region. In Phase II, for the period June-August 2017, the exhibition will be dispersed to 4 wineries in BC (that are confirmed). Phase III will see the exhibition re-assembled in September-October 2017 at the Penticton Public Library (also confirmed). As the exhibition moves across the phases, it is expected to grow organically by incorporating new perspectives and contributions from the industry and the wider public. Outputs include a digi-essay, conference presentation and journal paper, and further dissemination will be achieved through social media, partner networks, industry associations, and the existing UBC-KEDGE website.

The project will provide a space for dialogue amongst multiple actors, strengthening channels of communication, critical reflection, collaboration and shared understanding across the BC wine industry, and between academic researchers, industry and the community. The outcomes include student training and skill development through mentoring.

We expect that everyone experiencing the project will gain understanding of the approachability and relevance of research, therefore of the role of universities in impacting their region. This understanding will lead to new and enhanced partnerships across the different audiences. The exhibition is the communicative medium that represents research on regional socio-economic development. This medium makes knowledge accessible and engaging to a wider set of audiences, stimulating them into dialogue. Thus our project will create a flow of knowledge among multiple stakeholders, enhancing territorial cohesion and impacting economic and social development.



**THE RECENT HISTORY OF OCCUPATIONAL STRUCTURE
AND REGIONAL ECONOMIC STRATEGY IN NON-METROPOLITAN REGIONS**

RESEARCH WORKSHOP

Community Core of Westbank First Nation - 11th and 12th June 2016

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Appendix 2: Occupations workshop attendees 2016-2017

Keith Sugden	Cambridge Group for the History of Population and Social Structure, University of Cambridge, UK	ksugden1@aol.com
Roger Sugden	Faculty of Management, UBC's Okanagan campus	roger.sugden@ubc.ca
Laura Thorne	Library, UBC's Okanagan campus	laura.thorne@ubc.ca
Marcela Valania	Faculty of Management, UBC's Okanagan campus	marcela.valania@ubc.ca

Tentative attendees for June 10, 2017 workshop:

Patricia Roy - Department of History, University of Victoria

Ross Hickey - Irving K. Barber School of Arts and Sciences, UBC's Okanagan campus

Eric Li - Faculty of Management, UBC's Okanagan campus

Keith Sugden - Cambridge Group for the History of Population and Social Structure, University of Cambridge, UK

Malida Mookan - Faculty of Management, UBC's Okanagan campus

Marcela Valania - Faculty of Management, UBC's Okanagan campus

Jordan Coble - Sncəwips Heritage Museum, Westbank First Nation

Roger Sugden - Faculty of Management, UBC's Okanagan campus

Mary Butterfield - Faculty of Management, UBC's Okanagan campus

Ian Pooley – Okanagan historian

Paul Davies Irving K. Barber School of Arts and Sciences, UBC's Okanagan campus

Jack Wilson – undergraduate student (UBCO)

Cristalle Smith – undergraduate student (UBCO)

Tom Velk – Department of Economics, McGill University

Mengyue Zhao – McGill University

Heather Berringer – UBC Okanagan library

Chris Hives – UBC archives

The central objective of this project is to undertake pilot research on the history of *occupations* of Okanagan First Nations men and women in the late nineteenth and early twentieth centuries. This pilot work will be done in partnership with Westbank First Nation, and will support the development of a SSHRC Insight Grant on the topic of the relationship between occupational structure in the Okanagan region and planning for future economic development to be submitted in October 2017. This grant will support one full-time graduate student, and will result in a minimum of two co-authored journal articles.

Occupational structure refers to the distribution of people across different economic activities in the labour force, relationships among activities, and how each is supported and altered through local and remote knowledge, labour markets, cultural change, and public policy (Sugden and Sugden, 2016). Occupations matter because what people do is fundamental to their wellbeing (Sen, 1985), and because economic activity in general is reflected in how people are occupied in particular (Markusen, 2004; Koo, 2005). More specifically, knowledge about the history of occupational structure might be a catalyst for citizens to think about an economy’s future development, and might enable citizens to build that future (Mookken and Sugden 2016). Previous research on Canada’s economic history at the sub-national level typically considers the city or province as the unit of analysis (Coe and Emery, 2004; Emery and Levitt, 2002; Emery and Kneebone, 2008; Hickey and Jacks, 2011; Inwood *et al.*, 2014). *In contrast, this project focuses on occupations in a previously neglected, non-metropolitan region – the Okanagan – and in particular aims to work with an historically marginalized population.*

This project draws on the research approach developed by the *Cambridge Group for the History of Population and Social Structure* at the University of Cambridge, UK (e.g. Shaw-Taylor and Wrigley’s ongoing study of the occupational structure of Britain, 1379-1911, at the country, urban, local and rural levels¹; Shaw-Taylor, 2017; Wrigley, 2010). According to that approach, notable sources of knowledge on occupations are quantitative data and oral histories, as well as complementary material such as archive photographs and paintings. This project proposes to excavate and analyse primary data on the historical occupations of Okanagan First Nations men and women. This data includes but is not limited to the 1881-1921 Canadian censuses, and the 1913 Royal Commission on Indian Affairs in British Columbia. It is important to appreciate, however, that each of these records is problematic. Most notably, they are extremely poor in reflecting the actual occupations of First Nations peoples (Sugden and Sugden, 2016). As a result of the incomplete quantitative records, it will be important to consult the archives and existing oral histories at the Westbank First Nation Sncəwips Heritage Museum.

¹ <http://www.campop.geog.cam.ac.uk/research/projects/occupations/abstracts/>

Consortium for Clean Flight and Remote Access (CCFRA): Summary

Key activities: The central goal of this project is to identify a plan to grow clean flight technology opportunities for western Canadian organizations in the marketplace. “Clean flight” encompasses zero-emission aerospace activity, from the development of zero-emission unmanned aerial vehicles (UAVs) currently underway at UBC’s Okanagan campus, to the creation of electric helicopters and hybrid passenger jets, currently a major focus in Germany. This 12-month project proposes a comprehensive year-long study involving market intelligence, innovative cluster growth, export possibilities, and community needs assessment, as well as the development of a consortium of stakeholders who will lead the development of clean flight industry and markets in western Canada. This study will result in a roadmap that will lay out a plan for growth of the western Canadian economy. This is expected to focus on two areas. The first, and primary focus of the study, is on identifying the opportunities for the production, use, sale, and export of clean flight technology on the global market. The secondary focus of the study is to identify the potential for use of these technologies to grow the economies of western Canadian rural and remote communities by providing increased access to resources and supplies. The Consortium for Clean Flight and Remote Access (CCFRA) will create capacity in BC’s interior to contribute to the development, building, and operating of zero-emission aerial vehicle technology, policy development and social structures.

Project plan: The proposed project will run from September 1, 2017 to September 1, 2018 and will focus on the two primary objectives of building a consortium of stakeholders around clean flight and remote accessibility, and conducting an analysis to identify how to grow clean flight opportunities within Western Canada. Achieving these objectives will require successful completion of the following secondary objectives:

1. Establishing UBC’s Okanagan campus as the R&D hub for clean flight in Canada.
2. Working in partnership with Western Canadian industries and international partners to develop agreement on the content and design of next steps.
3. Conducting a needs assessment for rural and remote areas and communities in Western Canada, including the opportunity cost to develop the first generation of zero-emission unmanned aerial vehicles (UAVs) for the delivery of various cargo.
4. Developing a detailed 5-year project plan for the UBCO consortium’s contribution to the global challenge of clean flight and the local opportunity for delivery of essential services and cargo to remote communities.

Project milestones:

September 2017: Initial workshop to allow emerging stakeholder group to identify key areas of focus for the study.

September 2017 – September 2018: Study to identify opportunities to establish, develop and grow the industry around clean flight technology. Study will include market intelligence, stakeholder engagement, and cost analysis. Draft report to be delivered May 2018 and finalized September 2018.

May 2018: Consolidate relevant stakeholders around draft report and formalize roadmap for technology development and industry growth.

Key outcomes: Clear plan for growth of the development, commercialization, and production of clean flight technology that will: 1) surpass the current marketplace standard; 2) increase the training and employment of HQP in western Canada; and 3) increase the opportunities for SMEs and other organizations to pursue an international research and development opportunity.

**Socio-technical change and regional socio-economic development at UBC's Okanagan campus:
An introduction to the clean flight initiative**

The clean flight initiative represents an emerging approach at UBC's Okanagan campus that focuses on the development and deployment of technology with a concern for shaping and impacting the regional socio-economic development of rural and remote communities. Drawing broadly from all Faculties on the Okanagan campus, the approach brings together expertise in (*inter alia*) critical sustainability, rural health, remote service delivery, municipal planning, data science, economics, engineering, chemistry and management. In doing so, it aims to bridge both UBC campuses, providing opportunities for faculty based in Vancouver to develop their research in unique circumstances.

The emerging cluster on socio-technical change and regional socio-economic development has coalesced around the clean flight initiative as an opportunity to develop and apply a novel interdisciplinary approach. Central to this approach is the engagement of communities, municipalities, First Nations government, industry, and other relevant stakeholders in the co-creation of research priorities. The initiative is being driven with faculty across the Okanagan campus, and has the support of all Okanagan campus Deans. It is a focus for developing relationships across universities in the BC Interior, notably with UNBC, and has at its core developing international relationships with leading European institutions - Deutsche Luft und Raumfahrt Institutes (German Aerospace Research Institutes, DLR) and Delft University of Technology, Netherlands (DUT).

The clean flight initiative is at the intersection of key research interests across the Okanagan campus. The term "clean flight" encompasses zero-emission aerospace activity, from the development of zero-emission unmanned aerial vehicles (UAVs) currently underway in the Okanagan, to the creation of electric helicopters and hybrid passenger jets, currently a major focus of our partners in Germany. The clean flight initiative draws upon relationships with DLR and DUT regarding the development of clean flight technology in Europe, and the manufacturing and deployment of such technology in Western Canada and beyond. During 2017-2018, the project team involved in the clean flight initiative aims to build a multi-stakeholder consortium, as well as conduct a 12-month study identifying opportunities to establish, develop and grow an industry around clean flight technology in Western Canada. The study will rely on the production chain established by DLR with regard to the development of a small, regional electric plane, and will include market intelligence, stakeholder engagement, and cost analysis.

This initiative is housed within the Regional Socio-Economic Development Institute of Canada, and relies centrally on expertise in Management, Engineering, Chemistry, Nursing, and Economics. The project team submitted an application for funding to Western Economic Diversification Canada in February 2017, and intends to apply for an NSERC Connect to fund a workshop in fall 2017. A proposed cohort of post-doctoral fellows under the broader cluster initiative of socio-technical change and regional socio-economic development will contribute to the longer-term goals of the clean flight project once the multi-stakeholder consortium has been established.

The clean flight initiative enables UBC's Okanagan campus to develop work in a number of areas, such as:

- Regional economic development opportunities for a new, high-value industry with value-added job creation
- Public policy development
- Sustainability and environmental monitoring and modeling
- Urban planning and design
- Computer simulation and digital twinning
- Research based design, new materials, propulsion systems, etc.
- Concepts based in consumer and customer research
- Advanced manufacturing, industry 4.0, computer simulation and modeling

The proposed project will create an open source Community-University portal at the University of British Columbia's Okanagan campus. The portal application and source code will be fully license-able using the MIT License to other university campuses and organizations. The Community-University portal will facilitate access and relationship building between Universities and their constituent communities, allowing for the exchange of ideas and initiatives that will support collaborative research projects and experiential learning opportunities.

The Community-University portal will provide a *virtual* community entry point with the purpose of directly supporting collaboration. The portal will be an interface between the University and the community that will allow for two-way interaction. Community members and organizations will use the portal like a virtual library service desk, posing questions and problems. Some of these questions may lead to new research relationships, while some may support experiential learning opportunities. The portal will be constructed in the spirit of community-based research, where the community drives the process and method of engagement – posing questions and problems around which relationships can both coalesce and grow. The collaborations and partnerships that result from the portal will provide unique opportunities for both community-engaged research and transformative student learning for faculty and students.

This project will benefit the UBC Okanagan campus community, as well as the wider Okanagan community. Many post-secondary institutions have non-academic units dedicated to “community engagement”; the Vancouver and Okanagan campuses of UBC are no different. However, these offices focus on ensuring that the University is able to reach the community; holding public events, and building relationships based on donor, student recruitment, or research needs. There is currently no mechanism that allows communities to reach into the university, nor to provide direction to faculty, staff, and administration on the research needs of the community. The Community-University portal will act as such a mechanism, providing a way for community members to access the University on their own terms.



RSEDIC Seed Grant – Spring 2017 Competition

The purpose of the RSEDIC seed grant is to provide funding to support new areas of regional socio-economic research, and to increase the capacity for regional socio-economic inquiry on campus. Activities undertaken through the seed grant can include for example knowledge syntheses, and/or the collection of pilot data on a new topic. Applicants are encouraged to explore new research questions relevant to regional socio-economic issues that may arise out of existing or on-going research projects. Interdisciplinary applications that address the connections between regional economic development, health, arts, culture, and/or technology are especially encouraged, as are applications that push the boundaries of what is traditionally understood as socio-economic activities. Seed grant applications that can demonstrate a clear path for further development of the proposed project will be given priority. Successful applicants will be required to submit a short report on their progress and participate in a RSEDIC workshop in the fall of 2017. Successful Vancouver applicants are encouraged to discuss arrangements for the workshop with RSEDIC.

Value and duration: Grants are for up to a maximum of \$3500 over 6 months. No extensions are available.

Eligibility: The RSEDIC seed grant is open to all full-time tenure-stream faculty in the professorial stream on both campuses of UBC. Up to two awards may be granted to applications led by Vancouver-campus PIs. Faculty can only submit one application as primary applicant, but are able to be co-applicants on multiple applications. The applicant shall have, at the time of application for the funding, a term of appointment spanning the period of funding, or a signed commitment for a term of employment spanning the period of funding. Applicants who have any overdue final reports for internal funding, holds on their accounts or any other issues outstanding with the Office of Research Services on either campus at the time of application are ineligible.

Eligible expenses: The RSEDIC seed grant funds should be used to support a research assistant (UBC student or post-doctoral fellow). Up to 25% of the total award may be used for travel for research purposes if the collection of data is required for the seed grant project. Only expenses outlined in the original application are eligible for reimbursement. The purchase of non-disposable research equipment and/or travel to discuss or disseminate research are not eligible expenses under this program. Eligible use of funds is based on the tri-agency financial administration guide:

http://www.nserc-crsng.gc.ca/Professors-Professeurs/FinancialAdminGuide-GuideAdminFinancier/index_eng.asp

Evaluation: The applications will be evaluated by an inter-disciplinary committee of UBC Okanagan researchers, and chaired by the Director of RSEDIC who will receive and approve as final decisions by the committee. Evaluation will be based on the following criteria:

1. A statement of goals, project overview, significance/impact of the project. A clear statement of the relevance of the proposed project to regional socio-economic development is required. 50%
2. A clear work plan for undertaking the proposed work, as well as next steps for the project. 25%
3. The excellence of the researcher. 25%

Grant Administration: Individual PGs (research accounts) will be established for each grant-holder. Expenditures against this PG will be processed through the grant-holder's Faculty/Unit office. No additional funds will be made available during the grant term.

Term of the Grant: The term of each award is May 1 – November 15. No extensions will be granted. At the end of the grant term any unspent funds will be returned to the source PG.

Research Ethics: If the research study in the application requires review and approval by one of the UBC's Research Ethics Boards (i.e. Behavioral, Clinical, Animal or Biohazard), **ethics approval must be obtained within six weeks of the award date** or the grantee will forfeit the award. Applicants who plan to conduct human participants research for a new project that does not have ethics approval are encouraged to consult with Lisa Shearer, of the Okanagan BREB (lisa.shearer@ubc.ca) prior to submission of the application regarding their timeline.

Reporting: A final report must be submitted to the Okanagan campus Office of Research Services no later than six weeks after the end of the award term. Failure to submit reports will prevent consideration of subsequent RSEDIC grant applications.

Acknowledgements and copies of research/creative output: Recipients of the RSEDIC seed grant should acknowledge having received the award in any publication or creative work made possible as a result of being funded. By accepting the award, successful applicants agree to participate in a RSEDIC-supported news story for publication on the RSEDIC website and external circulation. If applicable, a copy of any publications or creative works funded by the award should be forwarded to the Director of RSEDIC.

How to apply:

Prepare all required attachments and submit to the Okanagan campus Office of Research Services by 4pm on April 18, 2017. Applications may be submitted hardcopy to Fipke 336 or electronically to Candace Martyn (candace.martyn@ubc.ca). All applications must be accompanied by a completed Research Project Information Form. The applicant, the applicant's Department Head, and the Dean/Associate Dean of Research must sign the RPIF.

All attachments must be:

- Word processed on 8 1/2 x 11" single-sided white paper, 3/4" margins
- Single-spaced, 12 pt Times New Roman font
- Principal Applicant's name must appear in the top right corner of every page

Proposal Sections:

1. Abstract of Proposed Project: Provide a 100-word summary of your research proposal. If successful, abstracts will be used in RSEDIC publications.
2. Project Description: Provide a one-page description of your research proposal. The description should include research methodology and anticipated research contribution and impact. If your proposed project arises out of an existing or on-going research project, please attach a one-page summary of the project.
3. Budget Justification: Provide a budget justification for the funds being requested (1/2 page maximum). See eligible expenses, above.
4. UBC CV or CCV

Funding contact: Mary Butterfield (mary.butterfield@ubc.ca)

5 May 2017

To: Okanagan Senate
From: Dr. Kate Ross, Registrar
Re: Election Results

Representatives of the Faculties to Senate

Two calls for nominations were issued for faculty members to represent their specific faculties: the first closed on March 22nd and the second closed on April 25th, 2017. Pursuant to Section 15 of the *University Act* the following faculty members are acclaimed as elected as representatives of the Faculties on the Okanagan Senate for terms beginning on September 1st 2017 and ending August 31st, 2020 and thereafter until successors are elected:

Representatives of the Faculty of Applied Science

- Shahria Alam, Associate Professor
- Deborah Roberts, Professor

Representatives of the Faculty of Arts and Sciences

- Jan Cioe, Associate Professor
- Jason Loeppky, Associate Professor

Representatives of the Faculty of Creative and Critical Studies

- Myron Campbell, Instructor
- Jennifer Gustar, Associate Professor

Representatives of the Faculty of Education

- Robert Campbell, Associate Professor
- Greg Wetterstrand, Associate Professor

Representatives of the Faculty of Health and Social Development

- Jennifer Jakobi, Associate Professor
- Manuela Reekie, Senior Instructor

Three individuals put their name forward for the two positions representing the Faculty of Management. An election was held between April 11th and 25th, 2017. One candidate was clearly elected; however, a tie for the second seat resulted:

Representatives of the Faculty of Management

Tamara Ebl, Lecturer	(elected)
Barbara Marcolin	tied
David Walker	tied

As required by Section 16 the *University Act*, the Senate must cast a deciding vote in the case of a tie.

Barbara Marcolin, Associate Professor, Management

It is my distinct pleasure to serve my FOM fellow colleagues as a representative on senate and bring our issues and concerns to the campus and back to faculty members. My many years of experience on University-wide committees, specifically the UBC Okanagan Senate Curriculum Committee, serves the Faculty well by informing people of current directions and trends, discussing our preferences and guiding us through building our Faculty. Over the years, I developed collegial relationships with other Faculties and faculty members across campus for open discussion where we found common ground. FOM gained by being considered in a greater number of campus initiatives.

During the FOM 4-year curriculum design, as academic lead in FOM, I managed collegial discussion of our faculty members choices within the new program. Through many open meetings, continual discussion until we had consensus, and strategizing with colleagues about how our courses integrate with one another, I captured the combination of management foundation disciplines courses and focus areas we desire as the academic faculty curriculum leaders going forward. These foundation discipline courses and focus areas position us well for the strategic choices we will make in June 2017, building upon our yearly retreats and planning within the Faculty.

Please vote for me and I will continue to build collegial opportunities between FOM and Senate.

Take care...Barb

David Walker, Assistant Professor, Management

I would like represent the Faculty of Management on the Okanagan Senate of the University of British Columbia. My desire to undertake this role is based on three objectives:

- 1 - To support strong governance at the University of British Columbia.
- 2 - To represent Faculty of Management interests to a broader university audience.
- 3 - To serve the interests of my colleagues in the Faculty of Management at a university level.

I am a current member of the Okanagan Senate and serve on the Senate's Learning and Research committee.