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MEMORANDUM

ATTENTION Senate **DATE** December 15, 2011

FROM Bill Krane, Acting Vice-President, Academic and Provost, and Acting Chair, SCUP **PAGES** 1/1

RE: Centres and Institutes Renewal Applications (SCUP 11-58)

At its December 7, 2011 meeting SCUP reviewed and approved the renewal of the following research centres and institutes for a five year term:

Institute of Micromachine and Microfabrication Research
Institute for the Humanities
Institute of Governance Studies
Mental Health, Law and Policy Institute
Centre for Education, Law and Society
Centre for Tourism Policy and Research
Co-operative Resource Management Institute
Centre for Experimental and Constructive Mathematics
Pacific Institute for the Mathematical Sciences (PIMS)
TRIUMF – Canada's national laboratory for particle and nuclear physics
Western Canadian Universities Marine Sciences Society (Bamfield)

The renewal applications are attached for the information of Senate.

Encl.

c: N. Haunerland

SCUP 11-58

SFU

OFFICE OF THE VICE-PRESIDENT, RESEARCH

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TO: Sarah Dench, Secretary
Senate Committee on University Planning (SCUP)

FROM: Dr. Norbert Haunerland

DATE: November 15, 2011

RE: Centre and Institutes Renewal Applications

Policy R40.01 specifies the end dates for the existing research Centres/Institutes. Enclosed please find the applications for renewal due this year:

1. Institute of Micromachine and Microfabrication Research
2. Centre for Labour Studies
3. Institute for the Humanities
4. Institute of Governance Studies
5. Mental Health, Law and Policy Institute
6. Centre for Education, Law and Society
7. Centre for Tourism Policy and Research
8. Co-operative Resource Management Institute
9. Centre for Experimental and Constructive Mathematics
10. Centre for Scientific Computing
11. Pacific Institute for the Mathematical Sciences (PIMS)
12. TRIUMF – Canada's national laboratory for particle and nuclear physics
13. Western Canadian Universities Marine Sciences Society (Bamfield)

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: Institute of Micromachine and Microfabrication Research

2. Director of the Centre

Name: Ash M. Parameswaran
Expiry Date of Term as Director: April 2016
Office Location: ASB 8851
Web Address of Centre: www.sfu.ca/~immr
Generic Centre Email: No generic e-mail

Phone Number: 778 782 4971
Fax Number: 778 782 4951
Director's Email: paramesw@sfu.ca

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

This institute will stimulate, encourage and enhance micromachining and microfabrication research by providing a focus and resource base for collaborative and multidisciplinary research leading to new processes and new devices of benefit across a wide array of disciplines.

4. Provide a detailed list of accomplishments of the Centre for the past five years.

The Institute of Micromachine and Microfabrication Research (IMMR) is operating on the basis of a group of researchers who have dedicated to support and collaborate to establish novel microfabrication technology that not only brings forth leading edge academic research, but also explores interaction with external to SFU organizations for research as well as potential commercialization opportunity. The members of IMMR actively support the operations of the Microfabrication Clean Room Facility, called as Engineering Science Clean Room Facility (ESCF) at the school of Engineering Science. This facility not only supports the IMMR members, it also serves the researchers across in Chemistry, Molecular Biology, Mechatronic Systems and Physics departments of SFU.

IMMR members actively participate in the upkeep and running of the ESCF, explore industrial collaboration, create collaborative research and development projects. Researchers from Royal Melbourne Institute of Technology (RMIT), Australia, and Concordia University, Montreal, King Abdulla University of Science and Technology (KAUST) have interacted with IMMR in the past. Further, British Columbia Institute of Technology (BCIT) sends a group of their electronics students every year to observe the microfabrication process and the ESCF offers two courses (ENSC 495 and ENSC 851) where the students are trained in the silicon based microfabrication and micromachining technology.

The academic research related accomplishment of IMMR in the last 5 years has been in the establishment of technology base at the school of Engineering Science. The accomplishments can be categorized into 4 parts.

a) Establishment of Polymer MEMS Technology
b) Establishment of PMMA Microfluidics Technology
c) Development of Polymer Prop-Up Structures useful for inertial sensors
d) Exploration of PMMA microfludic components for bio sensing applications

The active members of IMMR concentrated in developing technology base for micro sensors and actuators. The group concentrated their efforts in developing a novel microfabrication technology that utilizes polymers instead of silicon and its derivatives. This process allowed us to develop a novel polymer based surface micromachining technology. This effort was later complemented by extending the technology for producing PMMA microfluidic components. Typical microfluidic components are made using glass and the process is expensive and uses harsh chemicals and etchants. The research group developed a novel microfluidic technology utilizing PMMA (commercially called Plexiglas). This technology allowed us to produce hard-base microfluidic devices and components that can be used for chemical and biological sensors. Using the technology- base, two key contributions can be listed as a noteworthy accomplishment, namely the prop-up micro structures for inertial sensors and Microfluidic component for antibiotic susceptibility studies.

Prop-up micro structures:

This novel technology utilizes the polymer surface micromachining technology to produce micro platforms that can be 3-dimensionally assembled on a chip surface. This is currently being applied to inertial sensor development and also self assembled on-chip antenna projects.

Microfluidic components for antibiotic susceptibility studies:

The PMMA microfluidics technology that has been established at IMMR has contributed to the development of a micro chip that can be used for determining the correct antibiotic for the diagnosis and treatment of infantile diarrhea in rural India. This project attracted seed funding from Shastri Indo-Canadian Foundation and also served as the foundation for the molecular diagnostics research interest.

The active members of the institute now wishes to continue their collaborative, interdisciplinary research and development in the area of novel point-of-care diagnostic devices that can aptly fit the new paradigm shift in the health care diagnostics area and serving the greater need of the world-wide demand for rapid diagnosis and effective treatment.

5. Has your Centre accomplished its goals?

The centre has successfully demonstrated its strength in technology development and clearly contributed to the application of technology to real world devices and systems.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

Since the past membership list and the organization structure was fairly simple, yet effective, the space below is utilized to describe section-6:

The organizational structure was kept fairly simple so as to reduce bureaucracy and increase productivity. This allowed the enthusiastic members to contribute to the development of the institute's research and development activity without any hindrance. The past membership consisted of 10 members with Dr. Ash Parameswaran as the director. The members were:

Past membership:
Dr. Albert M. Leung, ENSC, SFU
Dr. Glenn Chapman, ENSC, SFU
Dr. Shahram payandeh, ENSC, SFU
Dr. Andrew Rawicz, ENSC, SFU
Dr. Marek Syrzycki, ENSC, SFU
Dr. Paul Li, CHEM, SFU
Dr. Hogan Yu, CHEM, SFU
Dr. Bonnie Gray, ENSC, SFU
Dr. Behraad Bahreyni, ENSC, SFU
Dr. Carlo Menon, ENSC, SFU

Continuing active members from the past list:
Dr. Albert M. Leung, ENSC, SFU
Dr. Marek Syrzycki, ENSC, SFU
Dr. Behraad Bahreyni, ENSC, SFU
Dr. Carlo Menon, ENSC, SFU
Dr. Glenn Chapman, ENSC, SFU
Dr. Bonnie Gray, ENSC, SFU

Members joined and actively participating in the institute activities since Sept 2010:
Dr. Tim Beischlag, FHS, SFU
Dr. Gratein Prefontaine, FHS, SFU
Dr. Ed Park, ENSC, SFU

Members to be invited:
Dr. Arun Garg, Head of Pathology, Royal Columbian Hospital
Dr. Mark Brockman, FHS-IMBB, SFU
Dr. Zabrina Brumme, FHS, SFU
Dr. Woo-Soo Kim, ENSC, SFU

7. Provide a summary of financial resources attracted and used, both from the University and external sources. (Attached a separate document, if necessary.)

The following sections outline the funds attracted for the Institute related research and development activity. These funds are attracted exclusively for the institute activity and do not include any of the member's individual (or group) Tri-Council, CFI or other research grants or contracts.

Funds Attracted:

Period	Source	Amount
Year-1 2006-2007	External	$3000.00
Year-2 2007-2008	External	$6500.00
Year-3 2008-2009	External	$5046.00
Year-4 2009-2010	External	$4218.00
Year-5 2010-2011	External	$23005.00

Funds Used/Spent:

Period	Amount spent	Purpose
Year-1 2006-2007	$5259.59	Materials and supplies, computer purchase for the lab.
Year-2 2007-2008	$1876.10	Materials and supplies, Minor equipment purchase to enhance experimental capabilities.
Year-3 2008-2009	$2933.44	Minor equipment purchase to enhance experimental capabilities.
Year-4 2009-2010	$0.00	None
Year-5 2010-2011	$17519.67	Salary for Research Associate, ENSC laboratory user fee, Materials and supplies.

8. Please identify the university resources, if any, provided to your Centre.

Space: No special space has been provided for the institute.

University Personnel: None

Major Equipment: Institute does not have any specific major equipment allocated for its exclusive use.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

Competitive technology development in the area of microtechnology, MEMS in particular, and its application to the real world scenario require a co-ordinated effort of a combination of expertise. In the past 5 years the active members formed the critical group that provided the knowledge and the direction of activities. This is possible only by an active group that represents various disciplines. Therefore the institute serves as a platform to enable the novel direction of activity that contributes novel research and development.

10. Provide a rationale for the continuation of your Centre.

The institute has established a critical mass in technology as well as direction of research. New membership and activity direction has been focused on the development of novel diagnostic tools and devices. The institute has also attracted amount of funds to start new research direction and activities in the medical diagnostic device development.
The institute allows us to build new collaborations to tackle new challenges according to the SFU strategic research plan. We plan to expand the role of the centre in education by hosting regular meetings among researchers from multiple departments. We are moving forward with building international collaborations with institutions in India, France, USA, and Australia among others and allow enthusiastic younger faculty members to investigate novel potential solutions. The centre provides mentoring opportunity to these young researchers among other benefits. Continuation of the institute will allow the members to actively formulate novel research and development activity, combine their efforts to attract industrial support and launch novel interdisciplinary research and development.

11. List your Centre's goals for the next five years.

Active members of the institute has already established strong links with the Pathology Department of Royal Colombian Hospital, Centre for disease control, Vancouver, BC and TB research Institute, Chennai, India. The institute has made a strong link with enthusiastic and emerging researchers in the faculty of Health Sciences and their advice is invaluable for the future direction of activities. We plan to launch an interdisciplinary, industrially relevant and academically leading research and development activity in the formulation and implementation of ultra miniature medical diagnostic instrumentation. The group has already made efforts to attract funds from global sources such as Gates Foundation. Effort is already underway to hold a meeting for Biomedical and Biotechnology Industries of BC to interact with the institute to understand the challenges in point-of-care technology development. Further, several members of the institute is actively participating in the Canada-India-Research-Network. Further, the group is actively participating in discussions on finding diagnostic solutions for cardio-vascular disease diagnosis, TSH and Lypase monitoring. More importantly, the group had identified target areas in early cancer diagnosis technology and HIV-TB diagnosis techniques. These developments are considered clinically important and commercially attractive areas in diagnostic devices demand. We plan to invite two leading HIV research experts from the Faculty of Health Sciences to be part of the Institute to further enhance the interdisciplinary activities of the Institute. Further the institute has established strong links with the BC cancer agency and we are exploring various

research funding avenues. These activities will allow the institute to have a focused goal in the development of novel miniature diagnostic instrumentation of the future.

The institute allows us to build new collaborations to tackle new challenges according to the SFU strategic research plan. We plan to expand the role of the centre in education by hosting regular meetings among researchers from multiple departments. We are moving forward with building international collaborations with institutions in India, France, USA, and Australia among others and allow enthusiastic younger faculty members to investigate novel potential solutions

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

While the past operational structure was fairly successful, we would like to bring in the changes slowly to make the institute activity better. We will explore different communication techniques offered by various campus units to improve interaction between the members. Also, we plan to introduce industry interaction activities to initiate discussions with local, national as well as international industries and research institutes to explore collaboration. The institute would like to invite few members from the faculty of Health Sciences into the membership. The institute also plans to bring Dr. Arun Garg, the head of the pathology department of Royal Columbian Hospital as a member and also other leading researchers from the BC Cancer Agency. Discussions are underway to include overseas members.

13. Provide an updated calendar description if different from the old listing on the first page.

"This institute will stimulate, encourage and enhance interdisciplinary research that integrates engineering, health sciences, molecular biology and chemistry to formulate technology and procedure to develop novel medical diagnostic instrumentation"

14. Outlook for the future and other comments, by the Director of the Centre:

The new active members and the joint activities have created an energetic co-operation which shows excellent promise for novel technology and diagnostic instrumentation to be developed. Links established with Canada-India-Network, Raman Research Institute, Bangalore India, TB Research Institute, Chennai India and active links with the BC Centre for Disease Control, will propel the institute activities to new heights and contribute significantly to high quality research as well as to society. We plan to host regular seminars and meetings within SFU to encourage a wider participation of campus as well as local community members.

Signature of the Director of the Centre/Institute

_____ Date: 12 Dec 2011

Director

Revised document based on SCUP request, Dec 12, 2011.

Faculty Dean – Centres Only

a. Comment on the Centre's performance:

The Centre is active and is performing well.

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

It is attracting funds and is expected to remain self-sufficient.

c. Recommendation:

I fully support a 5-year renewal.

Signature of the Faculty Dean or Vice-President, Research

L. Cameron Date: Aug. 4, 2011

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date:_____

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Supplementary material submitted for the renewal of the
Institute of Micromachine and Microfabrication Research (IMMR)

List of scientific publications:
The following list the publications of the institute members for the last 5 years. While the institute members have research agenda beyond the mandate of the IMMR, the following list shows only those publications that was linked with the IMMR related research activity and the clean room facility offered by the school of Engineering Science.
Total Journal publications: **54**
Total Conference publications: **133**

Dr. Parameswaran's research group refereed journal publications

1. S. Chhina, A. Bajwa, M. Rahbar, A. Kaleibar, P. Li, M. Parameswaran, "Ultra-low-cost PMMA Microfluidic Device Fabrication and Electrophoeretic Pinch Injection", *Journal of Medical and Biological Engineering*, 31(2): (2011) 105-110
2. B. C. Chang, J. Berring, M. Venkataram, C. menon, M. Parameswaran, "Bending fluidic actuator for smart structures", *Smart Mater. Struct*, 20 (2011) 035012 (8pp)
3. M. Pallapa, L. Ou, M. Parameswaran, H-Z. Yu, "Software-Based Quantization of Bioassays on CD", *Sens Actuators*, B. 148 (620-623)2010.
4. A. Mahanfar, S-W. Lee, M. Parameswaran, R. G. Vaughan, "Self-Assembled Monopole Antennas with Arbitrary Shapes and Tilt Angles for System-on-chip and System-in-package Applications", *IEEE Transactions on Antennas and Propogation*, Vol. 58 No. 9, 2010.
5. M. Rahbar, S. Chhina, D. Sameoto, M. Parameswaran, "Microwave-induced, thermally assisted solvent bonding for low-cost PMMA microfluidic devices", *J. Micromech. Microeng.*, 20 (2010) 015026 (10pp)
6. H. Mansour, S. Arzanpour, F. Golnaraghi, A. M. Parameswaran, "Semi-Active Engine Mount Design Using Auxiliary Magnetorheological Fluid Compliance Chamber", *Journal of Vehicle Systems Dynamics*, NVSD-2009-0053
7. M. Giassa, A. Khosla, B. Gray, A. Parameswaran, K. Kholi, R. Rameseshan, "Applications for Low Frequency Impedance Analysis Systems", *Journal of Electronic Testing, Springer,* 2009, DOI 10.1007/s10836-009-5125-3.
8. William Liu, Nikolai Dechev, Ian G. Foulds, Robert Burke, Ash Parameswaran and Edward J. Park, A novel permalloy based magnetic single cell micro array, *Lab Chip*, 2009, 9, 2381 - 2390, DOI: 10.1039/b821044f
9. A. Mahanfar, C. Menon, R.G. Vaughan, F. Capri, M. Parameswaran, K. Daheshpour, "Tunable Dielectric Resonator Antennas using Voltage-Controlled Mechanical Deformation", *Advances in Science and Technology, Trans. Tech Publications*, Vol 56, (614-619)2008.
10. Y. Li, P. Li, M. Parameswaran, H. Yu, "Inkjet Printed Electrode Arrays for Potential Modulation of DNA Self-Assembled Monolayers on Gold", *Analytical Chemistry*, Vol. 80, No. 22, November 15, 2008, pp 8815-8821.
11. T. Cheung, J. Wong, A. Parameswaran, A. Babul, F. Beg, KL. Kavanagh, A. Jirasek, U. Ribary, "A Scanner Independent Approach to Modeling Neural Activity with a Hardware Phantom", *Biomagnetism: Interdisciplinary Research and Exploration*; R.Kakigi, K.Yokosawa, S.Kuriki, eds, Hokkaido, University Press, pp: 89-91, 2008.
12. M. Haiducu, M. Rahbar, I.G. Foulds, R. W. Johnstone, D. Sameoto, M. Parameswaran, "Deep-UV patterning of commercial grade PMMA for low-cost, large-scale microfluidics, *J. Micromech. Microeng.*, 18 (2008) 115029 (7pp)
13. R.W. Johnstone, I. G. Foulds, M.V. Pallapa, M. Parameswaran, "Isopropanol/water as a developer for poly (dimethylglutarimide)", *Journal of Micro/Nanolithography, MEMS, and MOEMS.*, vol. 7, no. 4, pp. 043006 (5pp) 2008.

14. I.G. Foulds, R.W. Johnstone, S. Tsang, M. Pallapa, M. Parameswaran, "Exposure and development of thick polydimethylglutarimide films for MEMS applications using 254-nm irradiation", *Journal of Micro/Nanolithography, MEMS, and MOEMS.*, vol. 7, no. 2, pp. 023003 (8pp) 2008.
15. S-W Lee, D Sameoto, A Mahanfar and M Parameswaran, "Lithographic stress control for the self-assembly of polymer MEMS structures", *J. Micromech. Microeng.,* 18 (2008) 085004 (8pp)
16. D Sameoto, S-W Lee and M Parameswaran, "Electrical interconnection through optimized wirebonding onto SU-8 structures and actuators", *J. Micromech. Microeng.,* 18 (2008) 075023 (8pp)
17. I. *Foulds, R.W. Johnstone, and M. Parameswaran, "Polydimethylglutarimide (PMGI) as a sacrificial material for SU-8 surface-micromachining", J. Micromech. Microeng., vol. 18, no. 7, pp. 075011 (11pp) 2008.*
18. R.W. Johnstone, A.H. Ma, D. Sameoto, M. Parameswaran, and A.M. Leung, "Buckled cantilevers for out-of-plane platforms", *J. Micromech. Microeng.*, vol. 18, no. 4, pp. 045024 (7pp) 2008.
19. *I.* Foulds, R.W. Johnstone, S.-H. Tsang, M. Hamidi, and M. Parameswaran, "Polydimethylglutarimide (PMGI) as a structural material for surface-micromachining", *J. Micromech. Microeng.*, vol. 18, no. 4, pp. 045026 (8pp) 2008.
20. R.W. Johnstone, I.G. Foulds, and M. Parameswaran, "Deep-UV exposure of poly(methyl methacrylate) at 254 nm using low-pressure mercury vapour lamps," *Journal of Vacuum Science and Technology B.* vol. 26, no. 2, pp. 682-685, 2008.
21. Lin Wang, Paul C.H. Li, Hua-Zhong Yu, Ash M Parameswaran, "Fungal Pathogenic Nucleic Acid Detection Achieved with a Microfluidic Microarray Device" accepted in *Analytica Chemica Acta,* 6, 1 0 (2008) 97–104.
22. X.Y. Peng, P.C.H. Li, H-Z Yu, M. Parameswaran and W.L. Chou, " Spiral microchannels on a CD for DNA hybridizations", *Sensors and Actuators B: Chemical*, 128 (2007) 64–69
23. H. Cho, H. Yu and M. Parameswaran, "Fabrication of Microsensors Using Unmodified Office Inkjet Printers", *Sensors and Actuators B: Chemical*, 123 (2007) 749-756.
24. R.W. Johnstone, S-H. Tsang, I.G. Foulds, S-W. Lee and M. Parameswaran, "Fabrication of an inexpensive cleanroom module for microsystem testing", *J. Micromech. Microeng.*, 17(2007) N47-N51
25. D. Sameoto, S-H. Tsang, I.G. Foulds, S-W. Lee and M. Parameswaran, "Control of the out-of-plane curvature in SU-8 compliant microstructures by exposure dose and baking times", *J. Micromech. Microeng.*, 17(2007) 1093-1098.
26. See-Ho Tsang, Dan Sameoto, Ian G. Foulds and M. Parameswaran, "Automated Assembly of hingeless 90 degree out-of-plane microstructures", *J. Micromech. Microeng.*, 17 (2007) 1314-1325.
27. Dan Sameoto, See-Ho Tsanga and M. Parameswaran, "Polymer MEMS processing for multi-user applications", *Sensors and Actuators A: Physical* 134 (2007)457-464.

Dr. Leung's research group refereed journal publications

1. J. Bahari and A. M. Leung, "Micromachined three-axis thermal accelerometer," *Journal of Micromechanics and Microengineering* 21, pp. 75025-75037 (July 2011)

Dr. Bahreyni's research group refereed journal publications

1. M.A. Rasouli and B. Bahreyni, "Independent tuning of frequency and quality factor of micro-resonators for sensing and timing applications", *Applied Physics Letters*, vol 98, pp. 243508(1-3), Jun 2011.

Dr. Menon's research group refereed journal publications

1. Krahn, J, Liu, Y, Sadeghi A, and Menon, C (2011) A tailless timing belt climbing platform utilizing dry adhesives with mushroom caps, Smart Materials and Structures, Vol.20, No.11 (11pp)
2. Chang, B., Berring, J., Venkataram, M., Menon, C., Parameswaran, M. (2011) Bending fluidic actuator for smart structures, Smart materials and structures, Vol. 20, No. 3 (8pp)
3. Krahn, J, Sameoto, D, Menon, C (2011) Controllable biomimetic adhesion using embedded phase change material, Smart Materials and Structures, Vol.10, No.1, 015014 (8pp)

4. Sameoto, D, Menon, C (2010) Deep UV Patterning of Acrylic Masters for Molding Biomimetic Dry Adhesives, Journal of Micromechanics and Microengineering, Vol.20, No.11, 115037 (10pp)
5. Sameoto, D., Menon, C. (2009) Direct molding of dry adhesives with anisotropic peel strength, Journal of Micromechanics and Microengineering, Vol. 19, No.11, 115026 (5pp)

Dr. Syrzycki's research group refereed journal publications

1. R.Sobot, S.Stapleton, M.Syrzycki, Tunable Continuous Time Bandpass ΣΔ Modulators with Fractional Delays, IEEE Transactions on Circuits and Systems Part I: Regular Papers. Vol.53, No.2, pp.264-273, Feb. 2006.
2. Chin-Hsin Lin, Marek Syrzycki, Single-Stage Vernier Time-to_Digital Converter with Sub-Gate Delay Time Resolution, *Circuits and Systems*, Vol.2, No.4, pp.365-371, Oct. 2011.

Dr. Gray's research group refereed journal publications

1. S.F. Romanuik, S.M. Grist, B.L. Gray, D. Hohertz, K.L. Kavanagh, N. Gulzar, J.K. Scott, R. Nirwan, C. Hui, A.G. Brolo, R. Gordon, "Detecting Antibodies Secreted by Trapped Cells Using Extraordinary Optical Transmission", *IEEE Sensors Journal*, June 6, 2011, doi: 10.1109/JSEN.2011.2158643.
2. J. Patel, B.L. Gray, B. Kaminska, B. Gates, "Flexible polymer sensors for monitoring glucose in tears" *J Diabetes Sci & Tech,* Sept 2011, 5(5): 1036-43.
3. S.F. Romanuik, S.M. Grist, M. Haq, B.L. Gray, N. Gulzar, J.K. Scott, K.L. Kavanagh, D. Hohertz, A.G. Brolo, R. Nirwan, C. Hui, R. Gordon, "Microfluidic Trapping of Antibody-Secreting Cells", *J Med & Biological Eng*, 31(2): 121-127 (2011).
4. A. Khosla, B. L. Gray, "Preparation, micro-patterning and electrical characterization of functionalized carbon-nanotube polydimethylsiloxane nanocomposite polymer", *Macromolecular Symposia*, vol 297 issue 1 pp 210-218, Nov 2010.
5. M. Giassa, A. Khosla, B.L. Gray, M. Parameswaran, K. Kohli ,R. Rameseshan, "Applications for Low Frequency Impedance Analysis Systems", *Journal of Electronic Testing: Theory and Applications*, V 26, Issue 1 (2010), pp 139-144.
6. J.N. Patel, B. Kaminska, B.L. Gray, B.D. Gates, "A sacrificial SU-8 mask for direct metallization on PDMS", *Journal of Micromechanics and Microengineering (JMM)*, 19 115014 (10 pages), (2009).
7. A. Khosla, B.L. Gray, "Preparation, Characterization, and Micromoulding of Multi-walled Carbon Nanotube Polydimethylsiloxane Conducting Nanocomposite Polymer", *Materials Letters*, 63:13-14, pp. 1203-1206, 2009.
8. J. N.Patel, B. Kaminska, B.L. Gray, B. D. Gates, "PDMS as a sacrificial substrate for SU-8 based biomedical and microfluidic applications", *Journal of Micromechanics and Microengineering*, 18:9 (Sept. 2008) 095028, 11 pages.
9. S. Westwood, S. Jaffer, B.L. Gray, "Enclosed SU-8 and PDMS microchannels with integrated interconnects for chip-to-chip and world-to-chip connections", *Journal of Micromechanics and Microengineering*, 18:6 (June 2008) 064014, 9 pages.
10. S. Jaffer, B.L. Gray, "Polymer mechanically interlocking structures as interconnect for microfluidic systems", *Journal of Micromechanics and Microengineering* 18:3 (March 2008) 035043, 10 pages.

Dr. Chapman's research group refereed journal publications

1. F. Vasefi, M. Najiminaini1, E. Ng, B. Kaminska1, G.H. Chapman & J.J.L. Carson, "Angular domain trans-illumination imaging optimization with an ultra-fast gated camera", J Biomed Opt, Vol. 15, issue 6, 061710-1–061710-12, (Nov. 2010)
2. E. Ng, F. Vasefi, B. Kaminska, G.H. Chapman & J.J.L. Carson, "Contrast and resolution analysis of iterative angular domain optical projection tomography", Opt Exp., v18, 19, pp. 19444-19455 (2010)
3. F. Vasefi, E. Ng, B. Kaminska, G.H.Chapman K. Jordan, & J.J.L. Carson, "Transmission and fluorescence angular domain optical projection tomography of turbid media" Appl. Opt. 48, 6448-6457 (2009)

4. F. Vasefi, B. Kaminska, G.H. Chapman, and J.J. Carson "Image contrast enhancement in angular domain optical imaging of turbid media, Optics Express, Vol. 16 Issue 26, pp. 21492-21504 (2008)
5. F. Vasefi, B. Kaminska, P.K.Y. Chan, & G.H. Chapman, "Multi-spectral Angular Domain Optical Imaging in Biological Tissues Using Diode Laser Sources", Optics Express, v 16, 19, 14456-14468, 2008.
6. T. Schneider, H. Zhao, J.K. Jackson, G.H. Chapman, J. Dykes, U.O. Häfeli "Generation of biodegradable camptothecin-loaded polymer microspheres using hydrodynamic flow focusing", J. Pharmaceutical Sciences, Sci 97, 4943-4954, Mar. 2008.
7. F. Vasefi, P.K.Y. Chan, B. Kaminska, G.H. Chapman, N. Pfeiffer, "An Optical Imaging Technique Using Deep Illumination in the Angular Domain", IEEE J. Sel. Topics Quan. Elec., v13, 1610–1620, 2007.
8. M. Karimi, R. Tu, W. Lennard, G. H. Chapman, Karen L. Kavanagh, "Transparent Conducting Indium Bismuth Oxide", Thin Solid Films, v515 (7), 3760-65, 2007.

Dr. Parameswaran's research group conference publications

1. C. Loncaric, C. Ho, M. Parameswaran, H. Yu, A USB Powered Stand-Alone Electrochemical Biosensor for Point-of-Care Medical Diagnosis", 219th ECS Meeting, Montreal, May 1-6, 2011.
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11. N. Pfeiffer, G.H. Chapman, and B. Kaminska, "Optical Imaging of Structures Within Highly Scattering Material Using an Incoherent Beam and a Spatial Filter", Proc., Photonics West, BIOS10, Optical Interactions with Tissue and Cells XXI, v 7562, 756208-1- 08-11, San Francisco, Jan. 2010
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14. M. Najiminaini, F. Vasefi, B. Kaminska., G.H. Chapman, & J.J.L Carson,. Macroscopic fluorescent lifetime imaging in turbid media using angular filter arrays. IEEE EMBS 2009, pp 5364-5368. Sept. 2009.
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25. G.H. Chapman and V. K. Jain, "Defect Tolerance for a Capacitance Based Nanoscale Biosensor", Proc. IEEE Int. Symposium on Defect and Fault Tolerance, 305-313, Boston, MA Oct. 2008.
26. J. Leung, J. Dudasa, G.H. Chapman, Z. Koren, and I. Koren, "Characterization of pixel defect development during digital imager lifetime", Electronic Imaging Sensors, Cameras, and Systems for Industrial/Scientific Applications IX, v 6816, 68160A-1- 0A12 San Jose, Jan 2008.
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Photonics West Optical Interactions with Tissue & Cells XIX, v6854, 68541E1-1E12, San Jose, Jan 2008.
30. J. Dudas, M. L. La Haye, J. Leung, G.H. Chapman, "A Fault-Tolerant Active Pixel Sensor to Correct In-Field Hot-pixel Defects", IEEE Int. Symp. Defect and Fault Tolerance, pp 517-525, Rome, Italy, 2007.
31. J. Leung, J. Dudas, G.H. Chapman, I. Koren, & Z. Koren, "Quantitative Analysis of In-Field Defects in Image Sensor Arrays", Proc. IEEE Int. Symp. Defect & Fault Tolerance, 526-534, Rome, Italy, 2007
32. J.M. Dykes, C. Plesa, C. Choo, and G.H. Chapman, "Bimetallic Thermal Resists Potential for Double Exposure Immersion Lithography and Grayscale Photomasks", Proc. SPIE BACUS Symp. Photomask Technology, v6730, 673040-1 - 673040-10, Monteray, CA, Sept. 2007
33. J. Wang, J.M. Dykes, C. Choo, D.K. Poon, M. Chang, J.T.K. Tsui, and G.H. Chapman, "Bimetallic Thin Film Grayscale Photomasks for Complex 3D Microstructure Creation in SU-8", Proc. IEEE Canadian Conf. Elec. Comp. Eng. 2007, pp 1445-1448, Vancouver, BC Apr. 2007.
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Total Journal publications: **54**
Total Conference publications: **133**

(3)

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Institute for the Humanities**

2. Director of the Centre

Name: Samir Gandesha Phone Number: 604-726-6704

Expiry Date of Term as Director: 2013 Fax Number: 778-782-3405

Office Location: HC 2400

Director's Email: gandesha@sfu.ca

Web Address of Centre: http://blogs.sfu.ca/departments/humanities-institute/

Generic Centre Email: sgz@sfu.ca

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

Now in its 28th year, the Institute for the Humanities at SFU seeks to accomplish three basic objectives: stimulate student interest and faculty research in demonstrating the irreducibility of humanistic perspectives in understanding some of the most pressing social, economic, political and environmental problems we face and, above all, to engage the many publics beyond the academy in city, the province, the country and, indeed, the wider world. The Institute is perfectly placed, therefore, to play a key role in the idea of SFU as "student-centred, research-driven and community-engaged."

4. Provide a detailed list of accomplishments of the Centre for the past five years.

The Institute has hosted numerous public events: lectures, panel discussions, symposia, conferences and book launches over the past five years. The most significant of such events was the major international conference devoted to its multi-year focus on citizenship entitled "Cosmopolis/Cosmopolitics" held in May, 2010. The proceedings have been published in our recently re-launched journal *Contours*. The keynote speakers for this event were Professor Wendy Brown, Political Science, UC Berkeley, and the celebrated Iranian dissident, public intellectual and political philosopher, Ramin Jahanbegloo of the University of Toronto. Please see website for full list of events.

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5. Has your Centre accomplished its goals?

Yes the Institute has done an excellent job of fostering faculty research, supporting students and engaging the communities in the Lower Mainland and beyond.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

Director: Samir Gandesha
Personnel: Sandra Zink, Program Assistant

Steering Committee: Institute for the Humanities
Samir Gandesha, Chair - Associate Professor, Dept. of Humanities
David Mirhady – Assoc. Professor, Chair, Dept. of Humanities
Ian Angus – Professor, Dept. of Humanities
Stuart Poyntz – Assistant Prof. – School of Communication, SFU
Carolyn Lesjak – Associate Prof. – Dept of English
Anne-Marie Feenberg-Dibon – Assoc. Prof, Dept. of Humanities
Eleanor Stebner, Assoc. Prof. and J.S. Woodworth Chair

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources.** (Attached a separate document, if necessary.)

Period	Source	Purpose	Total Budget
Year 1	Endowments	Activities	~$60, 000
Year 2	Endowments	Activities	~$60,000
	Grant Simons	Student Support	$10, 000
Year 3	Endowments	Activities	~$60,000
Year 4	Endowments	Activities	~$60,000
Year 5	Endowments	Activities	~$60,000

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8. Please identify the university resources, if any, provided to your Centre.

Space: One office for Program Assistant. Currently, the Director of the Institute has no dedicated office. This makes it awkward to host meetings with prospective partners, speakers, donors, etc. We hope that this can be addressed in the near future.

University Personnel: .8 Program assistant fully funded by Endowment interest.

Major Equipment: None.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?
Our Institute has used its resources to facilitate interdisciplinary research between SFU faculty and faculty at universities throughout North America and Europe. This has and will continue to provide major benefits not simply to faculty but also to graduate students at SFU with interests in the liberal arts, particularly, of course, students in the new Humanities MA program. The Institute is also in the process of securing, through the Simons Foundation, further funding for graduate scholarships.

10. Provide a rationale for the continuation of your Centre.
The Institute does tremendous out-reach and public "engagement" work for the university by disseminating knowledge produced within the humanistic disciplines and creating much-need opportunities both within and outside of SFU for serious discussion of some of the key questions of our age: the possibilities and limits of democratic politics and citizenship, the environmental crisis, the problems of fundamentalism and pluralism, alternatives to violence, cosmopolitanism versus multiculturalism, non-Western humanistic traditions, etc.

11. List your Centre's goals for the next five years.
The Institute will be hosting a major symposium based on its new theme of "World Humanities" which poses the question as to the possibility of a dialogue between East Asian, Aboriginal and Western humanistic traditions. We hope to be able to collect the

proceedings and publish them with a major university press. We plan to celebrate our 30th anniversary in 2013 with a major lecture series and/or conference. We also hope to build our social media presence to be able to communicate with not just a local or national audience but also to show that we are genuinely "Thinking of the World." This will contribute materially to further raising SFU's profile globally.

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).
The structure, membership and organization has served us well to date and therefore we have no immediate plans to change.

13. Provide an updated calendar description if different from the old listing on the first page.

N/A

14. Outlook for the future and other comments, by the Director of the Centre:
The Institute just launched on September 24th its new website and on-line journal *Contours* at the Waldorf Hotel, which attracted a number of people who had never previously attended Institute events. We are hopeful that we will be able to make in-roads into new constituencies and communities as a result. The future outlook for the Institute is therefore very bright. We see the Institute playing an absolutely key role in the President's vision to make SFU the best comprehensive university in the country by supporting students, facilitating faculty research initiatives and engaging the community.

Signature of the Director of the Centre/Institute

_____ Date: Sept 23, 2011

Director

Faculty Dean – Centres Only

a. Comment on the Centre's performance:

The Centre is very active through public workshops, lectures and conferences in promoting research on important issues of this era. It will be expanding its attention to "World Humanities" to include non-Western and Aboriginal cultures. It reflects SFU's theme of community engagement, disseminates research in the Humanities to the larger community and will participate SFU's commitment to including Aboriginal culture in its activities.

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

The level of Faculty support is not likely to change.

c. Recommendation:

The Centre should be renewed.

Signature of the Faculty Dean or Vice-President, Research

_____ Date: Oct 3/11

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date:_____

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RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Institute of Governance Studies**

2. Director of the Centre

Name: Patrick Smith Phone Number:_778-782-3088__
Expiry Date of Term as Director:_ August 31, 2014__ Fax Number:_778-782-4786____
Office Location:_AQ 6054_____ Director's Email:_psmith@sfu.ca_____
Web Address of Centre: www.sfu.ca/igs_____
Generic Centre Email: _igs@sfu.ca_____

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)
The Institute of Governance Studies is intended to further research on governance issues.
Specifically its objectives include:

1. To provide a focus for research on issues and problems of governance - in Canada, at the municipal, regional/metropolitan, provincial and federal levels, in comparative domestic and Aboriginal systems and in the newly emerging global order.
2. To promote collaboration and research on issues of governance among scholars in a variety of disciplines located at Simon Fraser University.
3. To promote an institutional focus for international scholarship concerning issues of governance.
4. To provide a forum within the Vancouver metropolis, British Columbia and Canada for the presentation and dissemination of research and ideas on issues of governance.
5. To provide a facility in which data for the study of contemporary governance and related public policy can be collected, catalogued and made readily accessible through data management and exchange.
6. To provide a facility in which research and techniques can be made available for exchange with those having responsibility for contemporary governance.
7. To ensure that in keeping with SFU's commitment to local community outreach and connectedness research on governance also informs community discourse and decision-making.

4. Provide a detailed list of accomplishments of the Centre for the past five years.
   - Members/Associates completed the BC portion of a 5-year SSHRCC MCRI funded project ($2.5 million overall) on **Multilevel Governance**; multiple books/special editions of journals have resulted. More are forthcoming. IGS provided BC Team leadership; this project involved 12-15 RAships under research training and funding @ sfu, ubc. uvic, unbc.
   - Members have completed several years of **BC Genome**-funded research ($600,000) with multiple publications completed/multiple RAships @ senior ug/grad levels + post docs provided.
   - A "**Good Governance**" project has produced one book publication and assisted a variety of local/regional community groups – e.g., in Mission, Maple Ridge, Langley, Vancouver and local First Nations as well as provided invited expert advice to the Minister/Ministry of Community (Local Government Branch) of BC. Members have also taken over authorship of the standard text on Local Government in Canada (Nelson: 2012). The Good Governance project has also resulted in a series of planned one day workshops at SFU's Wosk Centre, beginning in December, 2011, in conjunction with the BC Office of Information and Privacy Commissioner/Registrar of Lobbyists. This collaboration with some of BC's Independent Officers is multi-year. The December conference is titled: Àbove Board and Beyond Reproach``, with seed funding from the Registrar of Lobbyists,BC. This project is a good example of IGS`s outreach efforts into the local-regional-provincial community, in keeping with SFU`s new visioning.
   - The international **comparative metropolitan governance network** which IGS has helped establish has produced a continuing series of book publications and placed work at SFU and on BC/Canada at the centre of such academic discourse.
   - The **Global Cities/Regions and Cross-Border Studies networks** continue to engage IGS members-associates in a variety of related projects; these have produced books, articles and special editions of journals, and continue to do so.
   - **Policy works** include a good number of IGS members – whether in re-publishing Canada`s most used Public Policy text (Howlett-Perl) or
   - The **Terrorism-Anti-Terrorism-Human Rights projects** continue with IGS members and Associates abroad.
   - IGS members provide the secretariat for the **British Columbia Political Studies Association**; several (Howlett/Summerville/Smith) were instrumental in the creation and initial editing of the on-line peer reviewed journal, the **Canadian Political Science Review**. This is shared by BCPSA, the Prairie Provinces Political Science Association (the current editors) and the Atlantic Provinces Political Studies Association. A variety of IGS members have published in the CPSR as well as other journals. Howlett/Migone are also involved in the establishment/management of the **World Political Science Review**, which translates into English top rated articles from across a range of national political science journals. It is published by Berkeley Electronic Press.

5. Has your Centre accomplished its goals?
IGS has been helpful in developing a widespread, productive dialogue across a range of policy and governance issues. It has helped develop collaborations leading to a good number of book/journal publications on local, regional, provincial, national and international issues. It has a record of research funding which has allowed for continuing training of young academics. It has hosted visitors from Europe, Asia, South America, New Zealand/Australia, the USA, the Middle East and across Canada; these have provided seminars and research talks with faculty and students as well as with the broader public; IGS has also facilitated meetings between foreign experts and local political leaders. It has organized orientation seminars for mayors/local and central government officials on study tours in Canada – from Viet Nam, Sri Lanka, East Africa, and West Africa – sometimes in collaboration with the International Secretariat of the Federation of Canadian Municipalities.
As such, the continuing work @ IGS involves commitment to attaining the goals established to guide IGS.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.
Organization:
Director and Project Coordinators-Members (at SFU and internationally).
Team meetings-reports-preparations for publication
4: Membership

Regular membership: IGS *regular* membership is available only to Simon Fraser University faculty: from the Faculty of Arts: Political Science: Alison Ayers, James Busumtwi-Sam, Marjorie Cohen, Maureen Covell, Laurent Dobuzinskis, Genevieve Fuji Johnson, Aude Claire Fourot, Andrew Heard, Anil Hira, Michael Howlett, Andreas Migone, Alex Moens, Peggy Myers, Doug Ross, Patrick J. Smith.

Economics: Richard Harris. Business Administration: Aiden Vining, Daniel Shapiro. MPP: John Richards, Kennedy Stewart

Associate/Adjunct/Visiting/Governmental Members include: Alain Gagnon (UQAM), Munroe Eagles, (SUNY-Buffalo), Jim Bickerton (St.FX), Ted Cohn (SFU),John Young (Addis Ababa+ Sudan/Gov of Canada), Shinder Purewal (KUC/SFU), Alex Netherton (MUC), John Shields (Ryerson), Bill Souder, (Telus), Rebecca Raglan (SFU), Alex Macdonald (ex-SFU), Dave Barrett (ex-SFU), Ed Broadbent (ex-sfu), Patsy Kotsopoulos, (CRTC, Govt of Canada), Jeremy Wilson (UVic), Andrew Johnson, (Bishop's), Jacqueline Ismael, (UofCalgary), Brian Downes (Oregon), Art Goddard (formerly with Canadian Consulate, Seattle), Don Alper, (WWU,Bellinghan), Bengt Streigffert, (UofLund,Sweden), Eran Razin, (Hebrew University of Jerusalem), Jung Ho Kim (Kyungpook National Univ, Korea), Chris Leo (UofWpg), Pierre Hamel (UofMtl), Caroline Andrew (UofOttawa), Tracy Summerville (UNBC), Gary Wilson, UNBC), Warren Magnusson (UVic), Tom Hutton (UBC), Bob Young (UWO), Emmanuel Brunet-Jailly (UVic), Tareq Ismael (Calgary), Stuart Farson (SFU), Andy Yan (UCLA), John Young, (UNBC), Dion Curry (Sheffield/EU), Kevin Ginnell (SFU), Steve McBride (McMaster) ....

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources**. (Attached a separate document, if necessary.)

Period Source Purpose Total Budget

Year 1

Total Revenues as of Spring 2006 = $32,268.29
1. Fund 31: 729051 MCS/BC
Start of year = $1,604.60 / End of year = $76.71
2. Fund 31: 759128 MCRI/SSHRCC – Multilevel Governance
Start of year = $12,795.14 / End of year = $5,135.23
3. Fund 21: 170136 Terra Housing
Start of year = $1,55.80 End of year = $491.63
4. Fund 21: 139073 - Canada PCO – CASIS
Start of year = $3.29 / End of year = -$142.99
6. Fund 21: 291327 IGS Publications Revenue Account
Start of year = $213.43 End of year = $389.03
7. Fund 21: 291340 - Think City – Tides (Canada) Foundation
Start of year = $104.43 / End of year = $513.33
8. Fund 13: 973121 – Arts/Publication Grant – BCSTUDIES
Start of year = $6000.00 / End of year = $6,000.00
June'07 MCRI new transfer = $13,466 (+ $2500. via UVic/MCRI)
Total Revenues as of Spring 2007 = $26,071.93

Year 2

The Institute had (as of Spring, 2007) the following SFU accounts;
1. Fund 31: 729051 MCS/BC
Start of year = $1,604.60 / End of year = $76.71
2. Fund 31: 759128 MCRI/SSHRCC – Multilevel Governance
Start of year = $12,795.14 / End of year = $5,135.23
3. Fund 21: 170136 Terra Housing
Start of year = $1,55.80 End of year = $491.63
4. Fund 21: 139073 - Canada PCO – CASIS
Start of year = $3.29 / End of year = -$142.99
6. Fund 21: 291327 IGS Publications Revenue Account
Start of year = $213.43 End of year = $389.03
7. Fund 21: 291340 - Think City – Tides (Canada) Foundation
Start of year = $104.43 / End of year = $513.33
8. Fund 13: 973121 – Arts/Publication Grant – BCSTUDIES
Start of year = $6000.00 / End of year = $6,000.00
June'07 MCRI new transfer = $13,466 (+ $2500. via UVic/MCRI)
Total Revenues as of Spring 2007 = $26,071.93

Year 3

The Institute had (as of Spring, 2008) the following SFU accounts;
Total Revenues as of Spring 2008 = $32,268.29
1. Fund 31: 729051 MCS/BC
Start of year = $76.71 End of year = $
2. Fund 31: 759128 MCRI/SSHRCC – Multilevel Governance
Start of year = $5, 135.23 / End of year = $
3. Fund 21: 170136 Terra Housing
Start of year = $491.63 / End of year = $

4. Fund 21: 139073 - Canada PCO – CASIS
Start of year = $149.99 / End of year = $
6. Fund 21: 291327 IGS Publications Revenue Account
Start of year = $398.03 / End of year = $
7. Fund 21: 291340 - Think City – Tides (Canada) Foundation
Start of year = $513.33 / End of year = $
8. Fund 13: 973121 – Arts/Publication Grant – BCSTUDIES
Start of year = $6000.00 / End of year = $6,000.00
June'08 MCRI new transfer = $13,466 (+ $2500. via UVic/MCRI)
Total Revenues as of Spring 2007 = $26,071.93
Total Revenues as of Spring 2008 = $

Year 4

The Institute had (as of Spring, 2009) the following SFU accounts;
1. Fund 31: 729051 MCS/BC
Start of year = $76.71 End of year = $76.71
2. Fund 31: 759128 MCRI/SSHRCC – Multilevel Governance
Start of year = $6279.99 / End of year = $-8.95
3. Fund 31: 521031 BC Genome
Start of Year = $127,600 / End of Year = $69,817.24
4. Fund 25: 170136 Terra Housing
Start of year = $1644.38 / End of year = $5163.38
5. Fund 21: 139073 - Canada PCO – CASIS
Start of year = $149.99 / End of year = $-1059.22
6. Fund 21: 291327 IGS Publications Revenue Account
Start of year = $408.77 / End of year = $678.23
7. Fund 21: 291340 - Think City – Tides (Canada) Foundation
Start of year = $513.33 / End of year = $-21.40
8. Fund 13: 973121 – Arts/Publication Grant – BCSTUDIES
Start of year = $6000.00 / End of year = $000.00
Total Revenue; 2008=$159,868.29
Total Revenue: 2009=$86,735.56

Year Five

The Institute had (as of Spring, 2010) the following SFU accounts;
1. Fund 31: 729051 MCS/BC
Start of year = $76.71 End of year = $0
2. Fund 31: 759128 MCRI/SSHRCC – Multilevel Governance
Start of year = $6279.99 / End of year = $0
3. Fund 31: 521031 BC Genome
Start of Year = $69,817.24 / End of Year = $21,000
4. Fund 25: 170136 Terra Housing
Start of year = $5163.38 / End of year = $1288.13
5. Fund 21: 139073 - Canada PCO – CASIS
Start of year = $-1059.22 / End of year = $01059.22
6. Fund 21: 291327 IGS Publications Revenue Account
Start of year = $678.77 / End of year = $392.23
7. Fund 21: 291340 - Think City – Tides (Canada) Foundation
Start of year = $513.33 / End of year = $621.75
8. Fund 13: 973121 – Arts/Publication Grant – BCSTUDIES
Start of year = $6000.00 / End of year = $000.00
Plus 2010-11

9 SSHRCC Small Grants: $13,500
10. BC Registrar of Lobbyists $4,000

8. Please identify the university resources, if any, provided to your Centre.
Space: 1 shared office

University Personnel: Director; project teams run by volunteer members

Major Equipment: none

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?
The initial intent and the major contribution of IGS is on research collaboration. A number of research clusters have either been initiated @ IGS or ones which have major IGS membership/involvement. These are regional/provincial, national and international. This collaboration has resulted in two major academic journals – the *Canadian Political Science Review* and the *World Political Science Review* – being established, edited and in one case (with CPSR) now handed on to IGS/BCPSA Associate members in Saskatchewan. In 5 years this journal will rotate back to editorship @ SFU/IGS.
The research collaborations – with the SSHRCC MCRI on Multilevel Governance, for example, or the BC Genome research – the collaborations have resulted in numerous research training opportunities for students – senior undergrad, MA, PhD and post doc.
All of these research clusters have been ongoing and provide opportunities for more future research. All have resulted in book and journal publications with reputable presses.
On a more personal local note, IGS collaborations provided for ongoing research and collegial discussions amongst departmental colleagues during a period when such intra-departmental interactions were strained in recent past years. These collaborations crossed some of the divides which emerged departmentally and allowed for conversations and trust re-building. They have been, and will remain, a positive aspect of our collective life as we go forward.

10. Provide a rationale for the continuation of your Centre.
When IGS was established its goals were clear. (See above). Each of these goals have been met and we have added a new one in keeping with the university's visioning of more community outreach. The research collaborations and clusters of which IGS is a part have healthy academic output, and all have clear intentions to continue working productively into the future. The work is varied – from local governing and intergovernmental relations to international terrorism and cross-border issues. Projects receive funding – from modest to more significant. These research activities support student research training via RA-ships and post docs. Members contribute considerably to policy discourse, locally to internationally based on their research expertise.
An IGS Associate member who has served elsewhere as Dean and Canadian Political Science Association president may have summed up the rationale for continuing IGS work: "I want to work on interesting projects with colleagues that I respect and like." IGS efforts over the past five years have demonstrated that capacity.

11. List your Centre's goals for the next five years.

- Other than more emphasis on community outreach, the goals of IGS will not substantially shift in the next five years. New projects, and new offshoots of ongoing cluster work will continue. That has been the value of the ongoing nature of such efforts. As an example, early 1980's involvement in the North American Federalism project, based at University of California, Berkeley's IGS provided the basis for the initial proposal of such an institute at SFU. Victor Jones, the founder of IGS-UCB was instrumental in its creation here at SFU. This early collaboration of Canadian and American scholars produced a series of books on comparative metropolitan and local governance over the past almost quarter century; the cluster now includes Australasian, European and Middle Eastern scholars as well EG.: (i) Peter Oberlander and Hilda Symonds, eds., *MEECH LAKE: FROM CENTRE TO PERIPHERY - THE IMPACT OF THE 1987 CONSTITUTIONAL ACCORD ON CANADIAN SETTLEMENTS: A SPECULATION*, (Vancouver: Centre for Human Settlements: University of British Columbia, 1988); (ii) Sancton-Rothblatt, eds , *Metropolitan Governance: American-Canadian Intergovernmental Perspectives* (UC Berkeley, 1993)-with 14 authors; (iii) Frances Frisken, ed., *THE CHANGING CANADIAN METROPOLIS: A PUBLIC POLICY PERSPECTIVE*, (Berkeley, California: Institute of Governmental Studies Press, University of California, 1994), Two Volumes – 33 authors; (iv) James Lightbody, *Canadian Metropolitics: Governing Our Cities,* (Toronto: Copp Clark, 1995), 12 authors; (v) *URBAN SOLUTIONS TO GLOBAL PROBLEMS: VANCOUVER~CANADA~ HABITAT II*, P.J. Smith, H.P. Oberlander and T. Hutton, editors, (Vancouver: University of British Columbia, Centre For Human Settlements, 1996), 237pp – 23 authors; (vi) Sancton-Rothblatt, eds , *Metropolitan Governance Revisited: American-Canadian Intergovernmental Perspectives* (UC Berkeley, 1998), - 15 authors; (vii) Katherine Graham and Susan Phillips, eds, CITIZEN ENGAGEMENT: LESSONS IN PARTICIPATION FROM LOCAL GOVERNMENT, (Toronto: IPAC/ICURR, 1998); (viii) Garcea, J. & Lesage Jr., E. (eds.) *Municipal Reforms in Canada: Dimensions, Dynamics, Determinants*, Toronto: Oxford University Press, 2003; (ix) Eran Razin + Patrick Smith, editors, *METROPOLITAN GOVERNING: CANADIAN CASES, COMPARATIVE PERSPECTIVES*, (Jerusalem: Hebrew University of Jerusalem/Magnes Press, 2006), 320pp; (x) Robert Young and Christian Leuprecht, editors, *Canada: The State of the Federation – Municipal-Federal-Provincial Relations In Canada,** (Kingston: Institute of Intergovernmental Relations, Queen's University, 2006); (xi) Lazar-Leuprecht, eds, *Spheres of Governance: Comparative Studies of Cities In Multilevel Governance Systems,* (Montreal-Kingston: McGill-Queen's UP, 2007) – 12 authors (xii) Don Phares, ed, *Governing Metropolitan Regions in the 21st Century, (Armonk,*New York:M.E. Sharpe, 2009)-21 authors; (xiii) Sancton-Young, eds, *Foundations of Governance: Municipal Government in Canada's Provinces* (Toronto: IPAC/Univ of Toronto Press, 2009)-28 authors; (xiv) Stewart-Smith, *Local Government in Canada,* 8th edition, (Toronto: Nelson, 2012) + there are 2 more MCRI books forthcoming,; there have also been multiple journal items related to this work.
- The longevity of these collaborations on local/metropolitan governing attests to the value added @ IGS. Each volume involves multiple authors with IGS connections.

Some of the other research networks are newer but equally as productive – e.g. on Global Cities/Regions and Cross-Border matters; or International Terrorism/Human Rights; (more details in Annual Reports)- these lists can be appended if needed

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

As noted in Goals, to reflect recent visioning for SFU collectively, IGS has added more focus on community outreach. Here the link between research work and community needs is central. In the past two years that has involved advising the Government of BC on local government electoral financing and well as a number of municipalities; it has included work with Aboriginal Organizations, particularly in Vancouver's DTES, on homelessness; it has allowed for advice to citizens' groups in localities such as Mission, Summerland, Central Saanich, etc; it has assisted a First Nation with all-candidates electoral meetings and held seminars to assist their thinking through local issues and concerns; it has produced a book on local democracy and used this in Think City community meetings in Vancouver....

Over the next five years, more of this linking of SFU research work and expertise to our community – locally, regionally, provincially, nationally and internationally will be enhanced. It will be strengthened by a continuing focus upon the importance of research clustering – as already developed and new ventures. The Good Governance series of annual seminars anticipated (from December, 2011) with some of BC's Independent Officers will bring together senior practitioners – in 2011 on lobbying –and community leaders and academic researchers. A timely post seminar publication on each will add to the value of the IGS co-sponsored dialogue.

Over the next five years the IGS will also examine synergies for more collaborative work with centres such as on Global Political Economy or on Political Representation.

The ongoing research teams have had sufficient experience that various members are able to initiate a new research offshoot. This has been especially the case on the comparative metropolitan and intergovernmental governance file – with different members picking up aspects of the research agenda and engaging both existing and new colleagues in 'next' versions of the research.

No major restructuring is anticipated though more internal workshops on grant proposing, led by colleagues with good track records on funding will be included over this next period.

13. Provide an updated calendar description if different from the old listing on the first page.

The Institute of Governance Studies is intended to further research on governance issues.

Specifically its objectives include:

1. To provide a focus for research on issues and problems of governance - in Canada, at the municipal, regional/metropolitan, provincial and federal levels, in comparative domestic and Aboriginal systems and in the newly emerging global order.
2. To promote collaboration and research on issues of governance among scholars in a variety of disciplines located at Simon Fraser University.
3. To promote an institutional focus for international scholarship concerning issues of governance.

4. To provide a forum within the Vancouver metropolis, British Columbia and Canada for the presentation and dissemination of research and ideas on issues of governance.

5. To provide a facility in which data for the study of contemporary governance and related public policy can be collected, catalogued and made readily accessible through data management and exchange.

6. To provide a facility in which research and techniques can be made available for exchange with those having responsibility for contemporary governance.

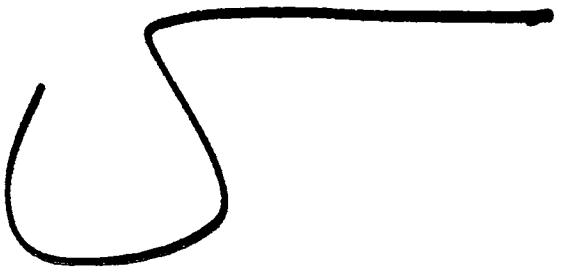
7. To ensure that in keeping with SFU's commitment to local community outreach and connectedness research on governance also informs community discourse and decision-making.

14. Outlook for the future and other comments, by the Director of the Centre:
IGS has the capacity to continue to meet its goals into the future. In doing so, it will continue to contribute to internal university dialogue and to links with research opportunities locally, nationally and internationally. It has established a track record on this and its efforts are reflected in a good range of well-received peer-reviewed publications – books, and journals. It has more recently added an emphasis on local community outreach – to link our research expertise with community issue discussions and problem solving. A number of these connections have been made and efforts over the next five year review period will seek to strengthen this, in keeping with SFU's recent visioning commitment.
The existing research networks have developed strong connections and will continue to be productive. Given the potential for economic challenges into the near future, building on existing connections would appear even more of a necessity.
IGS has been a productive and useful research centre. We look forward to contributing to the next half decade and beyond.

Signature of the Director of the Centre/Institute

Date: July 30, 2011 – with thanks to Assoc Dean P.McF

Director:



Faculty Dean – Centres Only

a. Comment on the Centre's performance:

The Centre is meeting its goals, is aware of the importance of community outreach and provides an important venue for collaborative research across the Faculty. It has an international reputation and has played a significant role in establishing two academic journals.

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

The Centre is largely self-sustaining; the Faculty provides little support.

c. Recommendation:

The Office of the Dean of Arts and Social Sciences recommends that the Centre be renewed for a further five years.

Signature of the Faculty Dean or Vice-President, Research

Date: Aug 28/11

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____

Date:_____

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION

Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: Mental Health, Law and Policy Institute

2. Director of the Centre

Name: Ronald Roesch Phone Number: 778-782-3370

Expiry Date of Term as Director: August, 2012 Fax Number: 778-782-3427

Office Location: RCB 6326 Director's Email: roesch@sfu.ca

Web Address of Centre: http://www.sfu.ca/~mhlpi/

Generic Centre Email: mhlpi@sfu.ca

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

This Mental Health, Law, and Policy Institute (MHLPI) was established in 1991 to promote interdisciplinary collaboration in research and training in areas related to mental health, law and policy. Its membership is drawn from the Department of Psychology and the School of Criminology at Simon Fraser University as well as government and community agencies in Canada and internationally. The MHLPI has received provincial and federal grants for a variety of research projects in the area of mental health and law, and also sponsors lectures and workshops. The MHLPI also publishes forensic psychology books, including manuals for assessing risk for violence and recidivism and assessing mental health problems in pretrial jails.

4. Provide a detailed list of accomplishments of the Centre for the past five years.

The MHLPI has received a number of contracts for research and training during the past five years. These contracts have totaled $591,955.00, including $70,355.00 in overhead funds to SFU. Since its inception, the MHLPI has received nearly two million dollars in contracts and has provided training and research experiences for dozens of graduate students. In this section, I will provide a brief description of contracts and other research and training activities during the past five years.

Training

The MHLPI has been centrally involved in graduate and post-doctoral training during the past five years. The BC Forensic Services has provided funds to the MHLPI for three post-doctoral positions and one clinical internship. The individuals in these

positions were appointed to positions at SFU, and they engaged in clinical and research activities through the MHLPI and Forensic Services. The MHLPI is currently negotiating a contract with Forensic Services for a post-doctoral position for the 2011-2012 period. Accelerate BC provided internship and research funding for a study of mental health issues in an emergency hospital. These funds supported a graduate student for a period of one year.

During the past five years, the MHLPI has hosted visiting graduate students for periods ranging from a week to a semester. These students were from universities in the Netherlands, Belgium, Italy, Scotland, and Portugal. The arrangements were made through either our formal research and training agreements (see #6 below) or by arrangement with MHLPI members in these countries. Faculty from universities in Quebec, the United States, Argentina, Portugal, Norway, Italy, and South Korea have also spent time as visiting scholars at the MHLPI in the past five years.

The MHLPI is collaborating with colleagues at the Don Calabria Institute (the Director of this institute is Dr. Alessandro Padovani, who is a member of the MHLPI) in Verona, Italy to develop a project focused on the analysis and comparison of different models of juvenile justice, in order to assess their efficiency and efficacy both in primary and secondary prevention of youth crime. A funding application has been submitted to the European Commission's 7th Framework Programme.

The MHLPI co-sponsors a biennial conference with Correctional Service of Canada (CSC). The first one was held in 2005. CSC provides funds to the university through the MHLPI to cover the cost of these conferences. The next conference is scheduled for October, 2011, to be held at SFU Harbour Centre.

The MHLPI assisted in the development of an internet-based training program for psychologists in Spain. The first course was offered in 2007. I served as the Honorary President of this course, which is known as the Curso en Psicopatología Criminal of the Centro Internacional de Formación e Investigación en Psicopatología Criminal. Participants include forensic psychologists in Spain who are being trained as specialists to work in forensic psychology.

The MHLPI is a co-sponsor of the International Association of Forensic Mental Health Services annual international conferences. During the past five years, these conferences have been held in Amsterdam, Montreal, Vienna, Edinburgh, and Vancouver. The 2011 conference will be held in Barcelona. The MHLPI Director is currently President of this professional society.

The MHLPI has been asked to assist in the development of the Centre for the Advancement of Law and Mental Health, a research centre being created at Monash University in Australia. The MHLPI director has been appointed to its 12-member Advisory Board, with the goal of strengthening the ties between the two research centres. The Centre was launched on June 1, 2011.

Research

BC Forensic Services provided $300,000 to the MHLPI to develop collaborative research projects. Four projects were identified that received $225,000 of the total budget, with the remaining funds to be used in projects to be identified in the coming

year. The four projects would not have been developed without the funding directly provided to the MHLPI. The following are the projects funded to date:

Study 1: A Prospective, Repeated-Measures Study of Dynamic Risk Factors, Treatability, and Community Outcome among Forensic Psychiatric Patients. Principal Investigator: Kevin S. Douglas, SFU; Co-Investigators: Ronald Roesch, SFU, Johann Brink, Director of Research, BC Forensic Psychiatric Services Commission

Study 2: The Neurocognitive Profiles of Forensic Psychiatric Patients. Research team: Johann Brink, Deborah Ross, and Hendre Viljoen (Forensic Services), Stephen Hart, SFU.

Study 3. Development of the Short Term Assessment of Risk and Treatability (START). This project focused on research to establish a brief, clinical guide for the dynamic assessment of violence risk and treatability. The principal researchers were Christopher D. Webster, Johann Brink, Tonia Nicholls, Mary-Lou Martin, and Connie Middleton.

Study 4. An Examination of the Abilities, Risks, and Needs of Adolescents and Young Adults with FASD in the Criminal Justice System. Investigators: Ronald Roesch and Kaitlyn McLachlan. Funding for this research was also received from the Canadian Foundation on Fetal Alcohol Research. The Foundation grant provided $20,000 and Forensic Services provided an additional $10,000 to support this research.

The MHLPI is also involved in a number of other research projects. MHLPI Director Ronald Roesch and Member Margaret Jackson received a grant from the International Education and Youth Division (PRE) of the Canadian Department of Foreign Affairs and International Trade, International Research Linkage program award for the MHLPI to develop collaborative research with Belgrano University in Buenos Aires, Argentina. The project was entitled "Strengthening Academic Ties Between Argentina and Canada: The Assessment of Young Offenders within a Rights-based Policy Context." The Belgrano researchers met with us at SFU in August, 2009, and Roesch and Jackson met in Buenos Aires and presented at a conference in May, 2010. Data collection on our first project, an evaluation of the Argentinean application of the Spanish version of the Fitness Interview Test-Revised (a structured interview and rating scale designed to assess fitness to stand trial published by the MHLPI), is ongoing.

BC Youth Services contracted with the MHLPI to assist in program development and evaluation of youth services. MHLPI members Jodi Viljoen and Ronald Roesch and a number of graduate students worked on this contract over a two-year period.

The MHLPI has contracted with Giunti O.S. Organizzazioni Speciali Publishers to translate and publish an Italian version of the *Jail Screening Assessment Tool* and *Suicide Manual for Inmates,* and MHLPI members Dr. Silvio Ciappi (University of Pisa), Dr. Patricia Zapf (John Jay College) and Ronald Roesch are collaborating on a research grant application to conduct a study of the reliability and validity of these instruments in Italy.

Other Projects

The MHLPI has been contracted to conduct other projects. A grant from BC Corrections was provided for a study of pretrial mental health screening. This grant funded a research

study designed to assess the reliability and validity of the Jail Screening Assessment Tool (published by the MHLPI) in pretrial centres in BC. The BC Institute Against Family Violence provided funds to the MHLPI for a review of Violence and the Social Determinants of Health ($7,000).

Publications

The Institute publishes a number of forensic assessment instruments. Funds generated by these publications have been used to support student research and conference travel, as well as ongoing validation research on these manuals. Most of our manuals have been reprinted in other languages. For example, the HCR-20 has now been translated into 14 languages and is used throughout the world for violence risk assessment. A U.S. version of the FIT-R was published by Professional Resource Press, and it has also been reprinted in Spanish and French, and as noted above, the JSAT and the SAMI have been translated into Italian. MHLPI members have been active in providing training on the use of these instruments worldwide.

The following is a complete list of assessment manuals and books published by the Institute.

Boer, D. P., Hart, S. D., Kropp, P. R., & Webster, C. D. (1997). *Manual for the Sexual Violence Risk–20: Professional guidelines for assessing risk of sexual violence.* Burnaby, BC: Simon Fraser University, Mental Health, Law, and Policy Institute.

Douglas, K. S., Webster, C. D., Hart, S. D., Eaves, D., & Ogloff, J. R. P. (Eds.) (2002). *HCR-20 Violence Risk Management Companion Guide.* Vancouver, BC: Mental Health, Law, and Policy Institute, Simon Fraser University.

Eaves, D., Douglas, K. S., Webster, C. D., Ogloff, J. R. P., & Hart, S. D. (2000). *Dangerous and long-term offenders: An assessment guide.* Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University..

Eaves, D., Ogloff, J. R. P., & Roesch, R. (2000). *Mental disorders and the Criminal Code: Legal background and contemporary perspectives.* Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University..

Hart, S.D., Kropp, P.R., & Laws, D.R. with Klaver, J., Logan, C., & Watt, K.A. (2003). *The Risk for Sexual Violence Protocol (RSVP).* Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University..

Nicholls, T. L., Roesch, R., Olley, M. C., Ogloff, J. R. P., & Hemphill, J. F. (2005). *Jail Screening Assessment Tool (JSAT): Guidelines for mental health screening in jails.* Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University.

Roesch, R., Zapf, P. A., Eaves, D., & Webster, C. D. (1998). *The Fitness Interview Test* (revised edition). Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University.

Webster, C. D., Douglas, K. S., Eaves, D., & Hart, S. D. (1997). *The HCR-20 scheme (version 2): The assessment of risk for violence.* Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University.

Zapf, P. A. (2006). *Suicide Assessment Manual for Inmates.* Burnaby, BC: Mental Health, Law, and Policy Institute, Simon Fraser University.

The MHLPI published a scholarly journal, the *International Journal of Forensic Mental Health*, from 2002-2008. This journal is the official publication of the International Association of Forensic Mental Health Services. The founding co-editors of this journal were MHLPI members Ronald Roesch and Stephen Hart. In 2008, an agreement was made with a commercial publisher, Taylor & Francis, to publish this journal.

5. Has your Centre accomplished its goals?

The goals of the MHLPI continue to be the promotion of research and training activities in the area of law and mental health. A particular focus has been the facilitation of international collaborations, as well as the dissemination of forensic assessment instruments that can be used in research and practice. This has been accomplished through attaining funding for research, conferences, and workshops, as well as the publication of forensic assessment instruments. During the past five years, the MHLPI has worked with colleagues in many countries, as we have been actively engaged in both research and training activities. In addition to the research described elsewhere in this report, the MHLPI has sponsored conferences in BC and throughout the world. Members of the MHLPI have also been active in providing training on the use of the forensic assessment instruments created by MHLPI members. These training workshops have taken place in over 20 countries. We have also provided training opportunities for students, both at SFU and from other universities who have spent time studying at SFU. The MHLPI has provided funding for graduate students to present papers and posters at international conferences.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

The MHLPI has a director, Professor Ronald Roesch, and a Management Committee (Professors Kevin Douglas, Marlene Moretti, Margaret Jackson, Raymond Corrado, and David Cox) that oversee operations of the MHLPI. There are currently 67 members from Simon Fraser University (Department of Psychology, School of Criminology, Faculty of Health Sciences), the province of British Columbia, and from many countries throughout the world (a complete list is attached). A total of 18 countries are represented (Argentina, Australia, Belgium, Canada, China, Colombia, Italy, Lithuania, the Netherlands, New Zealand, Norway, Poland, Portugal, Scotland, Spain, Sweden, United Kingdom, and United States). Internationally, the MHLPI has ongoing formal research and training agreements with a number of universities and research centres throughout the world. These agreements promote institutional exchange by inviting faculty and staff of the partner institution to participate in a variety of teaching and/or research activities and professional development; organize symposia, conferences, short courses, and meetings on research issues; carry out joint research and continuing education programs; and exchange information pertaining to developments in research and training at each institution.

The MHLPI has formal agreements with the following:

Vrije Universiteit (Amsterdam, The Netherlands)
Institute for Forensic Research (Craców, Poland)
Department of Psychology, Glasgow Caledonian University
Division of Forensic Psychiatry, Karolinska Institute, Stockholm, Sweden
Institut Philippe Pinel de Montreal (Quebec)
Universita' Degli Studi di Siena (Siena, Italy)
Social Research and Policy Implementation Institute (Siena, Italy)
University of Santiago de Compostela (Spain)

7. Provide a summary of financial resources attracted and used, both from the University and external sources.

Period	Source	Purpose	Total Budget
Year 1	1. BC Forensic Services 2. BC Institute Against Family Violence	1. Research and training projects with forensic services. This funding was provided in 2003 and continues to date 2. Literature review of Violence and the Social Determinants of Health	1. 300,000 2. 7,000
Year 2	1. Correctional Service of Canada 2. BC Corrections 3. BC Youth Custody Services	1. Second Biennial Forensic Mental Health Conference 2. Study of pretrial mental health screening 3. Program evaluation	1. 26,500 2. 18,000 3. 85,000
Year 3	British Columbia Forensic Services	Post-doctoral internship for years 2006-2008	109,000
Year 4	1. British Columbia Forensic Services 2. Accelerate BC 3. Correctional Service of Canada	1. Post-doctoral internship 2. Predoctoral internship 3. Third Biennial Forensic Mental Health Conference	1. 68,500 2. 15,000 3. 25,955
Year 5	1. Canadian Department of Foreign Affairs and Internation Trade 2. The Canadian Foundation on Fetal Alcohol Research grant, with supplementary funds from BC Forensic Services	1. Strengthening Academic Ties Between Argentina and Canada: The Assessment of Young Offenders within a Rights-based Policy Context 2. An examination of the abilities, risks and needs of adolescents & young adults with FASD in the criminal justice system	1. 15,000 2. 30,000

8. Please identify the university resources, if any, provided to your Centre.

Space: The university provides space for the MHLPI in RCB 7206. The MHLPI currently provides research space for several faculty members in the Department of Psychology. These include Dr. Stephen Hart, Dr. Jamal Mansour, and Dr. Ronald Roesch. Graduate students also use the MHLPI space to run studies using college student participants.

University Personnel: The Director of the MHLPI receives an annual administrative stipend. No other personnel are funded by the university.

Major Equipment: The university initially provided startup funds for the MHLPI when it moved into its current space in 1998. Since then, computers and other office equipment have been paid for by funds obtained from external agencies or generated from sales for the publications noted elsewhere in this report.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

The MHLPI has promoted research in Canada and internationally in a number of ways. The MHLPI has published forensic assessment instruments that were developed by MHLPI members. These instruments have been translated into many other languages and are used in research throughout the world in studies of the reliability and validity of the instruments as well as their application in other countries. The MHLPI has received contracts directly from provincial and national funding sources that were intended to draw on the resources of the MHLPI. For example, BC Forensic Services has provided $300,000 in research funds for the MHLPI to design and develop research projects on topics relevant to the mission of forensic services. Forensic Services has also provided funds for predoctoral and postdoctoral internships. These interns are employed by SFU through the MHLPI and provide research and clinical services at the Forensic Hospital. The ongoing relationship with Correctional Service of Canada has resulted in a biennial conference, with CSC providing funds to the MHLPI to cover the full cost of the conferences. The Canadian Department of Foreign Affairs and International Trade, International Research Linkage program provided funds to the MHLPI to develop collaborative research with Belgrano University in Buenos Aires, Argentina. Provincial agencies such as the BC Institute Against Family Violence and BC Corrections have provided funds to the MHLPI for specific projects that drew on the expertise of MHLPI members and facilitated the transfer of knowledge gained through our work on forensic assessment instruments. Finally, our affiliation agreements with similar centres in other countries have facilitated both research and training opportunities for MHLPI members and students.

10. Provide a rationale for the continuation of your Centre.

The MHLPI is actively engaged in current and planned research and training activities. As noted, we have ongoing projects and funding in BC through the BC Forensic Hospitals. We currently have one post-doctoral intern and we have initiated a search for a new intern to begin in September, 2011. We have two conferences we are co-sponsoring in the near future. In June, 2011, we are co-sponsoring an international conference to be held in Barcelona, Spain, and in October, 2011, we are co-sponsoring with Correctional Service of Canada a

conference to be held at SFU Harbour Centre. The MHLPI has ongoing research projects with colleagues in Argentina and planned collaborations with colleagues in Italy. In addition, we have ongoing research and training related to the forensic assessment instruments published by the MHLPI.

11. List your Centre's goals for the next five years.

It is expected that the MHLPI will continue to engage in the research and training activities in the area of mental health law and policy. The MHLPI is assisting in the development of a similar centre that is currently being established at Monash University in Australia. As noted in this report, MHLPI members are pursuing a major comparative study of juvenile justice through our connection with the Don Calabria Institute in Italy. We are also working with member colleagues to conduct research on the use of the forensic assessment instruments we have developed and that have been translated for possible use in other countries. Many of the instruments have been translated but there is a need to conduct validation research to ensure that the instruments can be reliably and validly used in other cultures. MHLPI Director Ronald Roesch and members Stephen Hart, Raymond Corrado, and David Cooke are working with MHLPI member Leif Waage at the Bergen Prison in Norway to develop collaborative research projects on risk assessment and management. Of course, we will also continue to be involved in training of graduate and post-graduate students, through our long term affiliation with BC Forensic Services. As well, we have a biennial conference with Correctional Services of Canada that provides educational experiences for over 200 CSC and affiliated employees.

12. Describe other changes planned upon renewal (e.g., membership, organization structure, etc.).

Our membership has steadily grown since the MHLPI began in 1991, and we typically add a few members each year as new collaborations are formed. There are no planned changes to the organization structure.

13. Provide an updated calendar description if different from the old listing on the first page.

The description was recently updated and does not need to be updated at this time.

14. Outlook for the future and other comments, by the Director of the Centre:

I am optimistic about the future of the MHLPI. It has become established and known throughout the world as a centre that produces high quality research, training, and publications. The membership of the MHLPI reflects a diverse and international perspective on research and training in mental health law. I am particularly pleased that we have been able to attract an exceptionally talented membership that includes many of the leaders of our field of research.

Signature of the Director of the Centre/Institute

Ronald Roesch Date: June 20, 2011

Director

8

Faculty Dean – Centres Only

a. Comment on the Centre's performance:

See Attached

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

c. Recommendation:

Signature of the Faculty Dean or Vice-President, Research

Date: Aug 22/11

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date:_____

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Comment on Centre's performance:

The Centre has an international reputation in areas related to mental health, law and policy, such that it is working with researchers at Monash University in Australia to develop a similar unit. It is very successful in securing research funding primarily through government agencies in forensics and corrections. It is active is disseminating research results through conferences and publications. It plays an important role in training of highly qualified personnel through graduate student training, funding post-doctoral positions, and organizing training workshops nationally and internationally.

Comment on future Faculty support for the Centre (financial, teaching release, space, etc.)

The Faculty will continue to provide a stipend to the Director of the Centre. The Faculty supplies space in RCB 7206. Some of that space is being repurposed for the Centre for the Reduction of Violence Among Children and Youth.

Recommendation

The Office of the Dean of Arts and Social Sciences recommends renewal of the Centre. It is a very active unit in research and training, provides a locus for researchers in important areas of law, forensics and policy, and attracts significant funding.

Mental Health, Law, & Policy Institute

Member Name	Institution	Department
Gail Anderson, Ph.D.	Simon Fraser University	Criminology
Liliana E. Alvarez, Ph.D.	Universidad de Ciencias Empresariales y Sociales, Buenos Aires	Forensic Psychology
Ramón Arce, Ph.D.	University of Santiago de Compostela, Spain	Forensic Psychology
Derek Eaves, M.D.	Simon Fraser University	Mental Health, Law, and Policy Institute
Anna Baldry, Ph.D.	Second University of Naples	Psychology
Henrik Belfrage, Ph.D.	Vaxjo University, Sweden	Applied Criminology
Eric Blauuw, Ph.D.	Vrije University	Forensic Psychology
Johann Brink, M.D.	BC Forensic Psychiatric Services Commission	Director of Research
António Castro Fonseca, Ph.D.	University of Coimbra, Portugal	Psychology
Silvio Ciappi, J.D., Ph..D.	University of Pisa, Italy	Criminology
Deborah Connolly, LL.B. Ph.D.	Simon Fraser University	Psychology
David Cooke, Ph.D.	Glasgow Caledonian University	Psychology
Raymond R. Corrado, Ph.D.	Simon Fraser University	Criminology
David N. Cox, Ph.D.	Simon Fraser University	Psychology
Kevin Douglas, LL.B., Ph.D.	Simon Fraser University	Psychology
Prof. Dr. Jorge Oscar Folino	National University of La Plata, Argentina	Forensic Psychiatry
Naomi Goldstein, Ph.D.	Drexel University, Philadelphia	Law and Psychology
William Glackman,	Simon Fraser University	Criminology

Ph.D.		
Robert Gordon, Ph.D.	Simon Fraser University	Criminology
Isabel Grant, LL.B., LL.M.	University of British Columbia	Law
Stephen D. Hart, Ph.D.	Simon Fraser University	Psychology
Jim Hemphill, Ph.D.	Simon Fraser University	Psychology
Margaret Jackson, Ph.D.	Simon Fraser University	Criminology
P. Randall Kropp, Ph.D.	Simon Fraser University	Forensic Psychiatry and Psychology
Friedrich Lösel, Ph.D.	University of Cambridge	Criminology
Marlene M. Moretti, Ph.D.	Simon Fraser University	Psychology
James R. P. Ogloff, J.D., Ph.D.	Monash University, Australia	Psychology
John Petrila, J.D., LL.M.	University of South Florida	Mental Health, Law, & Policy
J. Don Read, Ph.D.	Simon Fraser University	Law and Forensic Psychology
N. Dickon Reppucci, Ph.D.	University of Virginia	Psychology
Ronald Roesch, Ph.D.	Simon Fraser University	Psychology
Randall R. Salekin, Ph.D.	University of Alabama	Psychology
Joti Samra, Ph.D.	Simon Fraser University	Health Sciences
Edward Seidman, Ph.D.	New York University	Psychology
George Tien, Ph.D.	Simon Fraser University	Psychology
Barry Cooper, PhD	BC Forensic Hospital	Psychology
Geert Vervaeke, Ph.D.	Catholic University	Law

Simon Verdun-Jones, J.S.D.	Simon Fraser University	Criminology
Christopher D. Webster, Ph.D.	Simon Fraser University	Psychology
Rita Zukauskiene, Ph.D.	Mykolas Romeris University, Lithuania	Psychology
Art Gordon, Ph.D.	Correctional Service of Canada	Regional Director
Martin Grann, Ph.D.	Stockholm, Sweden	Karolinska Institute
Teresa Jaskiewicz-Obydzinska	Cracow, Poland	Institute of Forensic Research
Leif Waage	Western Norway Correctional Service	Prison Services
Odette Terol Levy, LMFT, PsyD	International Center of Criminal and Forensic Psychopathology, Madrid	Director
Tonia L. Nicholls, Ph.D.	Forensic Psychiatric Services Commission	Senior Research Fellow
Maureen C. Olley, Ph.D.	St. Paul's Hospital, Vancouver	Psychology
Alessandro Padovani, Ph.D.	Don Calabria Institute	Director
Deborah Ross, M.A.	Riverview Hospital	Psychology
Gina Vincent, Ph.D.	University of Massachusetts Medical Center	Assistant Professor
Karen Whittemore, Ph.D.	Forensic Psychiatric Services Commission	Psychology
Patricia Zapf, Ph.D.	John Jay College, New York	Forensic Psychology
Douglas Boer, PhD	University of Waikato, New Zealand	Psychology
Jennifer Skeem	University of California, Irvine	School of Social Ecology
Julian Somers	Simon Fraser University	Health Sciences
Michael van der Wolf, LL.M M.Sc.	Erasmus University, Netherlands	Criminal Law
Hjalmar van Marle,	Erasmus University, Netherlands	Forensic Psychiatry

M.D. Ph.D.		
Julia Isabel Eslava Rincón, M.A.	Pontificia Universidad Javeriana, Bogota, Columbia	Centro de Proyectos para el Desarrollo
Joel Dvoskin , PhD	University of Arizona	Medicine
Alessandro Padovani	Don Calabria Institute	Verona, Italy
Charlotte Waddell, MD	Simon Fraser University	Children's Health Policy Centre
Bob McMahon	Simon Fraser University	Psychology
Jamal Mansour, PhD	Simon Fraser University	Psychology
Candice Odgers, PhD	University of California	Psychology
Bernadette McSherry	Monash University	School of Law
Richard Wollert, PhD	Independent practice	Vancouver, WA
Antonio Andres-Pueyo, PhD	University of Barcelona	Psychology

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **CENTRE FOR EDUCATION, LAW & SOCIETY**

2. Director of the Centre

Name: Dr. Wanda Cassidy Phone Number: 2-4484 CELS Phone: 2-8045

Expiry Date of Term as Director: Continuing Fax Number: 2-4302

CELS Office Location: Galleria, Faculty of Education, SFU Surrey

Cassidy's Faculty Office: 8664, Faculty of Education, SFU Burnaby

Director's Email: cassidy@sfu.ca

Web Address of Centre: www.cels.sfu.ca

Generic Centre Email: cels@sfu.ca

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

The Centre was established in 1984 and given formal approval by the Board of Governors in 1994. Its central purpose is to improve the legal literacy of children and young adults through a program of research, teaching, curriculum development, and community initiatives. Law-related education encompasses: an understanding of law, its role in society and impact on the individual; the relationship between law and governance/ citizenship/democracy; issues relating to social justice and fundamental human rights; conflict and dispute resolution; school law, policies, procedures and culture. CELS works primarily with teachers and prospective teachers, school administrators, and educational and legal organizations to help fulfill its mandate. Projects include: research into cyber-bullying / cyber-kindness; support for a school for high risk youth; investigating the ethics of care and justice in school settings; investigating youths' legal literacy; assessing students' and teachers' understanding of human rights, citizenship, identity and sustainability. Projects vary from year to year, depending on the needs of the educational community, the Centre's priorities, and the ability to obtain external funding. Three Undergraduate courses and one Graduate course in Law Education have been developed and are offered on a regular basis through the Faculty of Education. The three Undergraduate courses also are available through Distance Education. The Centre attracts a number of graduate students interested in human rights, social justice, citizenship education, the ethics of care, and school culture.

4. Provide a detailed list of accomplishments of the Centre for the past five years.

Because the work of the centre focuses on research, teaching, curriculum development and community initiatives our accomplishments are described according to these categories, although there is often overlap among the categories.

Research:

A Qualitative Study of the Lives of Students and Staff in a Holistic Education Program with Individualized Aboriginal Focus (study completed; one journal article completed.)

- This was a joint project with community partner, Focus Foundation of BC. Funding from the Dept. of Justice Canada allowed program development for aboriginal youth deemed "at risk" and who attend the Whytecliff Education Centre, Burnaby and Langley sites. The project re-developed the school curriculum to focus more specially on aboriginal knowledge and ways of learning. CELS contributed curriculum development expertise, and also managed the research portion of this project.

Changing the Life Trajectory of Gang-Involved Aboriginal Youth with Complex Needs (study completed; one book chapter completed, journal articles in progress).

- This project was a follow-up project to the one identified above. Also a joint project between CELS and Focus Foundation of BC, this project was aimed at aboriginal youth with complex, co-occurring needs, who had been referred to Whytecliff Education Centre by the courts or youth justice. CELS was involved in the development of this program and also evaluated it for the Department of Justice.

Extending Cyber-bullying Research into Cyber-kindness – Dean of Education grant to Centres (study completed; one journal article published, one book chapter published, one article out for review)

- The grant was a follow-up to the SSHRC study on cyber-bullying, involving Cassidy and Jackson and Brown (from Criminology). In this study, we sought to examine online exchanges between youth in grades 6-9, from cyber-bullying to cyber-kindness. We were interested in determining the extent to which young people also send kind, thoughtful or considerate messages to each other on social networking sites. This study also involved interviewing teachers and a parents' survey.

Legal Literacy for Youth Project: January 2008-December 2011 (research in progress).

- This project aims to improve the legal literacy of youth in grades 6 to 10 in BC schools, with a cross curricular emphasis and an issue-based focus, concentrating on two broad concepts, the *rule of law* and a *just society* and

emphasizing four main themes: human rights, identity, citizenship and environmental sustainability. This project involves research as well as teacher education, resources development, in-school support at the community level, and web-based initiatives.

- Specific research tasks undertaken to date:
    - Researched legislation and case law related to human rights, identity, environmental sustainability and citizenship (posted on CELS website). Evaluated and wrote a report re where law-related education is found in the BC Curriculum and where there are opportunities to infuse or integrate law-related content (provided a basis for what we developed in the area of curriculum and materials for this project.
      Developed an instrument to survey students in several schools in 5 school districts; administered survey.
      Interviewed the teachers in the schools being surveyed.
      Surveyed students at SFU in the Professional Development Program (prospective teachers).
      Plan to survey students in PDP at UVictoria and UBC in the Fall 2011, with our partner colleagues, Dr. Clark and Dr. MacGregor. These surveys and interview results will provide a greater understanding of students' and teachers' needs in the area of legal literacy.

Exploration of Copyright Law in context of web-based resources (e.g. YouTube), and the relationship to the Supreme Court of Canada ruling on fair use (still in progress).

On-Line Journal: www.lawconnection.ca.
Developed jointly with the Justice Education Society of BC and the Law Clerks at the BC Supreme Court, this journal is designed to provide legal and resources information to teachers on various legal issues. The journal is published approximately 4 times a year, each around a given theme that relates to the BC School curriculum: for e.g. youth justice, consumer law, environmental law, bullying and harassment, etc. The Law Clerks write the legal backgrounders and CELS RAs develop the lesson ideas and the resources for that theme. This involves research, curriculum development and in-school support.

CELS Website: www.cels.sfu.ca
During these past 5 years we have developed and upgraded the CELS website, to highlight our research and the work of CELS and to provide information on law-related topics for schools. Recent evaluation of the use of the site shows that this website gets up to 5,000 hits per month from users.

Teaching

Distance Education Law Education Courses

In the early years of CELS development, we designed 3 new undergraduate courses, which were regularized and are now offered on a regular basis through Distance Education (and sometimes on campus). Courses:

EDUC. 445: Legal Context of Teaching
EDUC. 446: Law for Classroom Teachers
EDUC. 448: Teaching About Justice, Law and Citizenship

Each of these courses is regularly revised (several times over the past 5 years), with approximately 150 students taking these courses each year.

Development of a new course and minor: Infusing Global Perspectives into Curriculum – Educ. 435 and Development of a Minor in International and Global Education in the Faculty of Education, a joint project between CELS and International Programs in the FOE, with seed funding from a CELS CIDA-funded project.

Development of a new Graduate Diploma in the FOE on Global Education, an extension of the CELS CIDA project.

PDP Workshops

Each year, CELS notifies the Faculty Associates and Coordinators working in the FOE teacher education program (PDP) about the workshops we are willing to offer to students. Topics vary each year, but have included: human rights, cyber-bullying, school law, rights and responsibilities of teachers, teaching controversial issues, social justice in the classroom, global perspectives, developing a community of care in schools. Typically CELS staff conduct 5-8 of these workshops each year.

Development of new Graduate Course in Addressing Justice and Law-related Issues in Schools: This course is being offered for the first time as a Special Topics course, during Summer 2011, and will coincide with the Public Lecture Series in the 2011 Summer Institute on *Action for a Just Society*, also organized by CELS.

Development of new M.Ed. in Justice, Law and Ethics in Education
This is a new 2-year program, which will begin in September 2011, and be based at the Surrey SFU campus. Applicants have been selected, and come from the school system and other community-based educational environments.

Conferences

Provincial Global Education Symposium, with the BC Teachers Federation, June 2006, SFU Harbour Centre
Two of the CELS RAs worked with the BCTF to organize this conference, which drew educators from throughout the province, focusing on ways to integrate global concepts and practices into the schools, including issues of human rights and "a just society."

International Values and Leadership Conference, Victoria, BC,
CELS has been a co-sponsor for this conference, each of the times it has been located in Victoria, BC (2006, 2008 and 2011). CELS has participated on the planning committee for this annual conference, and has also supported several graduate students to present at the conference (in other years, the conference has been held elsewhere in the world).

Action for a Just Society: A Focus on Human Rights, Identity, Citizenship and Environmental Sustainability
November 2008, Wosk Centre for Dialogue, SFU
This conference was opened by the Lieutenant Governor of BC, the Honourable Steven Point, followed by a plenary presentation by Dr. Audrey Osler, from the U. of Leeds in the UK. This conference brought together keys players in the human rights and environmental sustainability communities in BC, addressing key law-related issues and also featuring educators who have developed curriculum on the conference themes.

Civic Engagement: Changing your Neighbourhood, Changing the World.
Held at Diamond Alumni Centre, November 2009
This conference featured guest speaker, Dr. Mary-Wynne Ashford, who is internationally known for her work as a physician and Education professor in promoting peace, cooperation and the civil society in local and international settings. This conference also featured the teachers who were involved in CELS-sponsored classroom projects on citizenship, the environment and human rights issues.

Action for a Just Society: A Focus on Youth and Schools
A series of Public Lectures is planned for July 2011, including a new Graduate course (EDUC 711) and an existing Undergraduate course (EDUC 448) to wrap around the lectures series.

Monday July 4, 1:30 – 3:00 pm
Action for a Just Society: Legal Literacy for Youth
Documentary Film Screening by Michael Hawley
Followed by Presentation by Judge Patrick Chen

Wednesday July 6, 2:00 – 4:00 pm
"Just" Volunteerism: A Global Perspective on Issues of Justice and Sustainability
Presentation by Yoo-Mi Lee and Mark Jacobs

Thursday July 7, 1:30 – 3:00 pm
The Environment, Citizenship & Student Action: Law-making from the Ground Up
Presentation by Joan Parsonson

Friday July 8, 10:30 am – 12:00 Noon
"You were born ugly and you'll die ugly too":
Online Freedom of Expression and Youth Culture
Presentation by Wanda Cassidy, Karen Brown and Margaret Jackson

Monday July 11, 10:30 – 3:00 pm
Lesson Plan: The Story of the Third Wave*

www.lessonplanmovie.com
Presentation by Executive Producer Philip Neel and two of the film's participants: Ron Jones, teacher & Mark Hancock, student
Film and response (10:30 am - 12:30 pm)
Interactive workshop with Ron Jones (1:00 - 3:00 pm)

Tuesday July 12, 1:30 - 3:00 pm
Law and Education: Natural Allies or Strange Bedfellows?
Presentation by Michael-Manley-Casimir and Kristen Manley-Casimir

Wednesday July 13, 2:00 - 4:00 pm
Media Literacy for Social Justice
Presentation by Paulina Semenec

Thursday July 14, 1:30 - 4:00 pm
Youth, Schools and Civil Rights
Presentation by David Eby

Curriculum (and Resources) Development

A number of curriculum materials for teachers/classroom use were developed during these past 5 years. These relate to particular areas of the BC schools curriculum, where resources were lacking and we felt we could contribute. All of these are posted on the CELS website.

A Growing Community: A case study where students examine the agricultural land reserve and environmental decisions.

Streamside Setbacks: The Coquitlam Case. A case study/simulation, which addresses salmon and stream development.

Human Rights in BC: A discussion of human rights legislation and policy and where human rights education fits into the BC curriculum.

Aboriginal Education Resources: Prepared by Davita Marsden as part of the study with Focus Foundation on Aboriginal ways of learning. An annotated list of resources by, or featuring, First Nations, that could be use in schools to enhance existing curriculum (currently being revised; not posted on website).

The Lennikov Case (in English and French). A case study that examines the real-life case of M. Lennikov and his fight to stay in Canada. Raises issues related to immigration, human rights and the notion of sanctuary.

A mock trial: "You Can't Say That! It's Cyber-libel": (in English and French). A mock trial designed for Middle School Students (where most of the cyber-bullying and cyber-libel takes place).

Crime and Punishment in Medieval Times: The Life, Trial and Execution of Joan of Arc: (in English and French). This project is geared to grade 8 and 9 social studies and asks students to work in groups to investigate this historical event from the perspectives of gender, power and justice.

The Employment Standards Act of BC and the BC Human Rights Code: (English and French). A practical resource, this instructional package addresses aspects of these acts that are pertinent to high school students. A number of legal case studies are used as examples.

The Royal Proclamation Act of 1763 and the Effect on Aboriginal Issues in Canada today. (in English; French to come). An examination of the impact of this historical act on issues facing First Nations' people today.

Current Legal Issues Position Papers : The CELS website has a current issues section, written by our RAs, which address topical law-related issues in the media, which have a connection to the school curriculum and the interests of students. For example, intergroup dialogue and social justice, police and schools, war crimes, restorative justice, youth justice, victimization.

Community Initiatives

Liaison and Joint Projects with the Public Legal Education Community in BC, Canada and the US.

For example,

PLEI (Public Legal Education and Information) Resource Catalogue. All agencies in the province providing services, education and/or information about the law. CELS is a contributor.

The Legal Portal – CLICK Law (www.clicklaw.bc.ca). The online resource was a few years in the making and came online in April of 2009. This site coordinates the delivery of legal education and information services (governmental and non-governmental) to the BC public. CELS was part of the planning team, and is a contributor.

CELS has a representative on the Steering Committee of Law-related educators of BC.

CELS is represented on the Public Legal Education Association of Canada, Research and Professional Development Committee and the Law-related Education Committee.

CELS is an Associate Member of the Centre for the Study of Leadership and Ethics at Nipissing University. This Centre is part of a consortium of centres based at universities in the USA, Sweden, Australia, Hong Kong and Canada.

Work Directly with Youth and/or Schools

Bees and Lavender Project – Burnaby Mountain Secondary School (2008-9). This project involved a social studies teacher working with her students to help change school district and Burnaby city policy to allow the planting of lavender on a plot of land off Gaglardi Way, as part of a sustainability project. This involved multiple players and agencies inside and outside the school.

Law Making from the Ground Up: The Urban Farm Project – Burnaby Mountain Secondary Secondary School (2009-10). Part II of this sustainability project involved developing an integrated urban farm project at school, which crossed curriculum areas and impacted the schools' policies on food, composting, and land use.

Youth Engagement: Developing Civic and Legal Literacies: Joint Project with U of Victoria and the City of Victoria Youth Council. (2008-2010). Our Collaborator, Dr. MacGregor worked with the CVYC to produce a brochure describing youths' legal rights and responsibilities and the youth also became involved in the civic campaign for the November municipal election.

Whytecliff Education Centre (Burnaby and Langley sites) (2006-2011). CELS staff assist the teachers working at this school for "high need" youth – curriculum design, resources, professional development, etc.

Six partner schools are associated with the Legal Literacy for Youth Project (in Vancouver, Burnaby and Surrey). Work with these schools to implement curriculum and instruction on the 4 themes of the Legal Literacy project: human rights, identity, citizenship, and environmental sustainability.

Environmental Sustainability – Project at Gladstone school involving the Science Department.

CELS staff consult regularly with schools and school districts on law-related curriculum and policy issues.

DVD Documentaries

Dare to Care: Transforming Schools Through the Ethic of Care.
This DVD was a joint venture between filmmakers from Life is Short Entertainment and CELS and features findings from Cassidy, Bai and Beck's SSHRC study on ethic of care in schools. This production won best documentary under 30 minutes at the Global

CommFest Film Festival in Toronto in September 2010. The DVD is distributed internationally by the National Film Board of Canada.

Action for a Just Society: Legal Literacy for Youth
This DVD is in progress and will be completed in 2011. It features members of the legal community, faculty members associated with CELS, and several participating schools involved in our Legal Literacy for Youth study. It is designed to raise discussion around the importance of teaching legal concepts and issues in the K-12 curriculum.

5. Has your Centre accomplished its goals?

Yes.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

Centre Director: Dr. Wanda Cassidy, Associate Professor of Education. Continuing appointment. A responsibility of her appointment in the Faculty of Education.

Project Coordinator: Dr. Karen Brown. This is a 2-day a week position. Dr. Brown was a doctoral student in Criminology and in 2011 successfully completed her Ph.D. She is also a part-time limited term lecturer in Education and also teaches in Criminology.

Administrator: Ms. Ann Cardus. Ann is responsible for the office, the accounting, conference organization, etc. This is a 1-day a week position.

Faculty Co-Investigators and Collaborators: The individuals involved vary depending on the project and research being undertaken. For example, the two primary faculty members associated with the 4-year Legal Literacy for Youth project (in addition to Cassidy) are Dr. Ozlem Sensoy and Dr. Kumari Beck. We also are collaborating on this project with Dr. Penney Clarke from UBC and Dr. Catherine MacGregor from U. of Victoria. Dr.Kelleen Toohey from Education was Acting Director during the 2007-08 fiscal year, when Dr. Cassidy was on Study Leave. Margaret Jackson, from Criminology was an integral member of the team that investigated Cyber-bullying and Cyber-kindness during the 2006-08 period. Heesoon Bai was involved in the preparation of the DVD on Dare to Care. Since the inception of CELS (over 25 years ago), there have been many Faculty members who have participated in the work of CELS, most from Education, but some from other departments. Their involvement relates to the project being undertaken.

Research Assistants:
CELS employs research assistants for its various projects. They attend all CELS meetings, which take place at least once every two months, and sometimes once a month. They

also work with the professors on the various projects, as well as take on specific tasks. During the five-year period of this report, we have employed 15 different RAs for our various projects. Some of these RAs have been with us for the duration of the five years, while others worked with us for up to one year.

Technology Support:
Vincent Wong works on a contract basis for CELS, managing the website and providing technology assistance.

Educational Consultants:
Occasionally CELS employs specialist to undertake specific projects. An example is Patrick Clarke, who recently retired as Director of Professional Development for the BC Teachers Federation and also the Director of Social Justice Education for the BCTF. He is CELS liaison with the schools on our Legal Literacy Project and also is chief author of the curriculum materials we have developed for this project.

Organizational Processes:
The individuals working on the various projects all meet together for a CELS meeting, which is held at least once every two months. Decisions are made collaboratively. A list-serve for CELS is used to communicate in between these meetings.

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources.** (Attached a separate document, if necessary.)

Period	Source	Purpose	Total Budget
Year 1			
2006-07	CELS Endowment Interest for fiscal year: $68,173 Provided through the capitalization formula at SFU. This fund allowed us to support a part-time Project Coordinator for CELS, a one-day a week Office Administrator, undertake various projects, and also provide RA support for these projects.		
2004-06	Joint Project Focus Foundation of BC and CELS (final year): $134,718 *A qualitative study of the lives of students and staff in a holistic educational program with individualized Aboriginal focus.* Funder: Department of Justice, Youth Justice Renewal Fund. Curriculum and research grant to address the educational needs of the Aboriginal students at Whytecliff Education Centre, Burnaby and Langley sites. Project was a joint application to DOJ, with Focus receiving the funds and CELS doing the research on the project and providing curriculum development assistance. Educational DVD also produced: *Aboriginal Spirit.* RAs: D. Marsden & E. Sohbat		
2006-08	Faculty of Education, Special Grant for Research Centres.: $17,046		

From cyber-bullying to cyber-kindness: What students, educators and parents are saying
Allowed CELS to extend Cassidy's SSHRC cyber-bullying research to investigate the opposite ends of online exchanges, cyber-bullying and cyber-kindness. This study involved a student survey for grades 6-9, teacher interviews and a parent questionnaire.
RA: K. Brown

Year 2

2007-08 CELS Endowment Interest for fiscal year: $69,173
Provided through the capitalization formula at SFU. This fund allowed us to support a part-time Project Coordinator for CELS, a one-day a week Office Administrator, to undertake various project, and also provide RA support for these projects.

2008-11 Law Foundation of British Columbia: $337,718 (funds received Jan. 2008)
Legal literacy for youth: An integrated, holistic project for BC schools
This project involved research, resources development, and professional development for teachers and school-based engagement, focusing on grades 6-10 in BC schools, and across several curriculum areas. Also involves producing a DVD on the importance of law-related education in schools.
RAs: K. Brown, M. Wu, A. Dejene, N. Parhar, M. Mizobe, C. Suhr, P. Clarke, M. Hawley, V. Wong, J. Parsonson.

2007-08 Joint Project, Focus Foundation of BC and CELS: $225,000
Changing the life trajectory of gang-involved Aboriginal youth who have complex needs and co-occurring problems
Department of Justice, Youth Justice Renewal Fund (Program development and research grant). CELS jointly wrote the grant proposal with Focus Foundation, with Focus receiving the funds and CELS conducting the research on the program and also offering consultation re the program development. DVD produced for educational purposes: *Tending the Soil,*
RA: L. Power, E. Staples

2007-08 Continuation of grant awarded in 2006: Faculty of Education, Special Grant for Research Centres: $17,046
From cyber-bullying to cyber-kindness: What students, educators and parents are saying

Year 3

2008-09 CELS Endowment Interest for fiscal year: $70,579
Provided through the capitalization formula at SFU. This fund allowed us to support a part-time Project Coordinator for CELS, a one-day a week Office Administrator, to undertake various projects, and also provide RA support for these projects.

2008-11 Continuation: Law Foundation of British Columbia: $337,718
Legal literacy for youth: An integrated, holistic project for BC schools

Year 4

2009-10 CELS Endowment Interest for fiscal year: $56,434
Provided through the capitalization formula at SFU. This fund allowed us to support a part-time Project Coordinator for CELS, a one-day a week Office Administrator, apply a portion to the Director's salary for course release, to undertake various projects, and also provide RA support for these projects.

2009-11 Continuation: Law Foundation of British Columbia: $337,718
Legal literacy for youth: An integrated, holistic project for BC schools

Year 5

2010-11 CELS Endowment Interest for fiscal year: $56,434
Provided through the capitalization formula at SFU. This fund allowed us to support a part-time Project Coordinator for CELS, a one-day a week Office Administrator, apply a portion to the Director's salary for course release, to undertake various projects, and also provide RA support for these projects.

2009-11 Continuation: Law Foundation of British Columbia: $337,718 (project will complete December 31, 2011).
Legal literacy for youth: An integrated, holistic project for BC schools

8. Please identify the university resources, if any, provided to your Centre.

Space:

According to the terms of the CELS endowment, the university provides space for the Centre. We are currently located in one office in the Faculty of Education area on the Galleria level of SFU Surrey. This allows us to work closely with the faculty at the Surrey campus and we are also close to many of our partner schools and schools districts south of the Fraser. Our upcoming (Fall 2011) M.Ed. in Justice, Law and Ethics in Education will be located at the Surrey campus.

University Personnel:

We provide all our own staffing, except that Finance looks after the funds and the distribution of payments. Occasionally, we involve staff from the Centre for Educational Technology in the FOE; for e.g. filming our public lectures or conference presentations.

Major Equipment:

CELS has purchased all our own computers, the projector and office printers and fax machine. The only equipment we use in the FOE is the photocopier and phones. We also use the office furniture provided at the Surrey campus.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

It would be impossible for one faculty member or even several faculty members to accomplish all that we have done in the Centre, since the founding over 25 years ago. A faculty member must focus on his or her own research and building up a research portfolio, whereas the mandate of our centre, the Centre for Education, Law and Society is more applied – to positively impact the legal literacy of children and youth in schools. This requires work directly in schools with teachers and with students and the development of professional development opportunities and other resources for educators, which will enhance their practice. Our projects, then, are both theoretical and applied and are able to impact schools directly. Further, through the funding that has come to our centre, we have been able to hire part-time experts or specialists in education who can help us fulfill our mandate. The funds that we are able to access each year from the $1.411 million CELS endowment provide a foundation from which we can hire a core team of committed staff and RAs, and also develop projects that are longer term in scope, without having to constantly look for additional funding. This core funding has also been the springboard for additional grants, such as the one we received from the Law Foundation during this reporting period. The work we do and the projects we undertake are possible because we are a Centre, a group of educators committed to law-related education for youth, and who seek to impact the field of education.

10. Provide a rationale for the continuation of your Centre.

We do very good work that extends knowledge through research, while also directly impacting the field of education. Our work is highly regarded by educators in the school system, by our funders, and by other provincial, national and international agencies that work in the field of law-related and public legal education. One indication of the level of support we have received internationally is Director Cassidy's 2011 Isidore Starr award from the American Bar Association, Public Education Division, for exemplary work in law-related education, the only non-American to receive this award in the 28 year history of the award. Although this is an individual award, her work has been connected with the work of CELS for the past 25 years, being the co-founder with Dr. Michael Manley-Casimir, in 1984.

Because CELS is situated within the university, we are able to bring the research dimension to the field of school and public legal education, and also to develop longer-term professional development opportunities and courses for teachers. This blend of theory and practice is essential to positively influencing the education of our youth. We also attract graduate students to the work we do in social justice, human rights education, school law and school culture, and provide financial support to them.

We are a team of highly energetic and productive individuals (faculty members, staff and RAs), and we believe that our work also enhances the reputation of the Faculty of Education and of the University.

11. List your Centre's goals for the next five years.

- Complete the Legal Literacy for Youth project:
  - Develop the 3 remaining curriculum projects and post these on the CELS website (also translating these into French)
  - Complete the research with PDP students at SFU and also administer the survey with PDP students at UBC and UVic (with our collaborators there).
  - Analyze the findings from our research with students, and the teacher interviews.
  - Publish the results in professional and academic journals, and hold ProD workshops for teachers to discuss the results
  - Complete the filming and editing of the documentary on *Action for a Just Society* (discussing the importance of law-related education in schools.)
  - Post all related materials on the CELS website for access by educators.

- Implement the planned 2011 Summer Institute Public Lectures on the theme of *Action for a Just Society: A focus on youth and schools*
  - Eight public lectures are being offered from July 4-14
  - A new graduate level credit course: EDUC 711: *Special Topics – Addressing Justice and Law-related issues in schools*, is part of the Institute and complements the public lectures. The course runs from 9 – 4 each day, July 4-15.

- Finalize the planning and implementation of the new M.Ed. in *Justice, Law and Ethics in Education*, to begin in September 2011, at the Surrey campus. The selection of students admitted to this program has been made; these students are also attending the Public Lecture Series at the Summer Institute.

- To coincide with the 2-year M.Ed. we will be implementing a research program, whereby we will assess the impact of this graduate program on participants' knowledge and their work in educational settings. CELS will be contributing funding to this initiative (RA support), plus we plan to apply to the Law Foundation for additional support.

- Course Development and Teaching:
  - We will continue to offer professional development workshops on law-related and social justice topics to students enrolled in SFU's teacher education program. We typically offer 5-8 such workshops each year.

- We also plan to do the required paperwork to make the Special Topics graduate course offered this summer, as a regular course offering.
- We plan to revisit the undergraduate course on Conflict Resolution, which we offered previously as a special topics course, and seek to revise and regularize this.
- We have been discussing with the Associate Director of Graduate Programs in the FOE about the possibility of developing an Ed.D. in the area of Social Justice and Law-related Education.

- Further Research:

  - We expect that there will be areas of further research that will come from our analysis of the data collected from the Legal Literacy for Youth study.

- Journal Development:
  - As a team, we have had discussions about possible starting an international academic journal which would address issues of social justice, law-related education, citizenship, and human rights education. There appears to be a need in this area, with a focus on education; however, we have not yet determined if we will go this route.

- Website Development:
  - We will continue to develop and enhance the information on the CELS website (www.cels.sfu.ca).

- Conferences:
  - CELS typically hosts a major conference every other year. While we have not yet planned for this event, we expect to host at least one major conference during the next 5-year period.

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

In the past (including these past 5 years), CELS has had the benefit of involvement of other faculty members from other SFU departments. We hope to further involve additional faculty members in related fields from other departments in our work, as Associate Members. Otherwise, we feel that our current organizational structure works well.

13. Provide an updated calendar description if different from the old listing on the first page.

The current description is fine.

14. Outlook for the future and other comments, by the Director of the Centre:

We have had a productive 5 years and look forward to an equally productive next 5 years. We appreciate the interest in, and support for, our work shown by the Dean of Education and our colleagues in the Faculty of Education.

Signature of the Director of the Centre/Institute

Director Date: Jan 30/11

Faculty Dean – Centres Only

a. Comment on the Centre's performance:
The Centre has been active in scholarly production, curriculum development and community engagement. Furthermore, in addition to the volume of productivity, the quality of its work is very good

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.): The Centre is essentially self-sustaining. We will continue to provide appropriate space for operations as per current arrangements

c. Recommendation:
I strongly support on-going operation of CELS

Signature of the Faculty Dean or Vice-President, Research

Date: Aug 29/2011

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Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date:_____

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Current membership 2010-11

CELS Personnel

Wanda Cassidy
Director

Wanda Cassidy is Associate Professor of Education at Simon Fraser University and Director of the Centre for Education, Law and Society. She works primarily in the areas of citizenship education and law-related education, with a focus on understanding the values and beliefs that underpin the legal system in a democracy and that contribute to developing a just and caring society. Currently she is completing a four-year research project with 14 teachers/principals to examine and implement the ethics of care in schools. She is also working with colleagues to assess the extent and impact of cyber-bullying in BC schools, as well as its counterpoint, "cyber-kindness." She has been instrumental in establishing a school for "drop-outs" and "push-outs", and is in the process of researching this school's unique program for aboriginal youth. Dr. Cassidy is the author of several books, book chapters, technical reports, journal articles and curriculum resources.

Özlem Sensoy
Research Co-Investigator

Özlem Sensoy is assistant professor of Education at Simon Fraser University. Her research and teaching are focused on examining how media and schools together shape knowledge about social groups based primarily on race, ethnicity, gender, sexuality, class, religion, and other group identities. Dr. Sensoy's work is informed by scholarship in cultural studies, critical pedagogy, critical multicultural education, and anti-oppression (anti-racist, -sexist, -colonialist) theories. She is the author of several journal articles, book chapters, and forthcoming books. For more, visit:http://www.educ.sfu.ca/research/sensoy

Karen Brown
Project Coordinator

Karen Brown is a Ph.D candidate and instructor in the School of Criminology at Simon Fraser University. She has authored and co-authored a number of articles on cyber-bullying/cyber-kindness and violence and threats against Canadian lawyers. She also revised two law-related distance education courses offered by the Centre for Education, Law and Society ("CELS") and the Faculty of Education through Simon Fraser University. She has worked with Dr. Cassidy on two cyber-bullying/cyber-kindness research projects and is currently a research associate on the CELS Legal Literacy for Youth, an integrated, holistic project for British Columbia schools. Her research interests include violence and threats against lawyers, and cyber-bullying/cyber-kindness in schools.

Patrick Clarke
Educational Consultant

Patrick Clarke: Recently retired from the administrative staff of the BC Teachers' Federation where he worked in professional development and social justice programs. He has also been involved in teacher education as a sessional instructor at SFU and UBC. His interest areas are social studies, citizenship education and global education. He has written, taught and mentored on these topics since he began his career in education in BC in the 1970's. As a result of his work at the BCTF and at the universities he is very familiar with the BC school curriculum, education policy and issues in education in BC.

Kumari Beck
Research Collaborator

Dr. Kumari Beck is an Assistant Professor in the Faculty of Education at Simon Fraser University. Her main research is located in international education, and is focused on the internationalization of higher education, the experiences of international students, and the internationalization of curriculum. Other research interests include globalization, postcolonial thought, anti-racist education and critical multiculturalism, curriculum and pedagogy in higher education, and the ethics of care.

Joan Parsonson
Educational Consultant

Joan Parsonson is a social studies teacher and Community Projects Department Head at Burnaby Mountain Secondary School and is involved in research-based learning and community-based sustainable green opportunities for citizenship development. She holds a B.Ed. in Policy and Administrative Studies from the University of Calgary, a Post Baccalaureate Diploma from SFU focusing on the integration of First Nations and multicultural curriculum, and a Master's degree from SFU with a focus on citizenship in relation to sustainable communities and effective decision-making.

Ann Cardus
Administrator

Ann Cardus returned to CELS after many years working in an advocacy role assisting those who seek resolution to difficult situations. Ann has always enjoyed the challenges and successes of working within the legal field and brings this energy and commitment to administering CELS programs and projects.

Vincent Wong
Technical Consultant

Vincent Wong attended his undergraduate studies at the School of Interactive Arts and Technology at Simon Fraser University. Currently the co-founder of RE Productions, a multimedia productions studio based in Richmond, BC, he works closely with CELS as a technical consultant, aiming to better facilitate the communication of the department with the world.

Ruth Yates
Retired Program Coordinator

Ruth Yates, MA, MEd, has written and edited several law textbooks and numerous law-related curriculum resources. She assisted in creating and developing the first Law Connection and coordinated the preparation and posting of articles and learning resources since its inception. Ruth served on the Ministry of Education committee that developed the Law 12 IRP. She has taught law related education courses at SFU and UBC, both on campus and on-line.

Alana Abramson
Research Assistant

Alana Abramson is a passionate advocate for restorative justice, non-violence and social justice. She has extensive experience as an academic, teacher/trainer and practitioner of restorative approaches in community, prison, and school settings. Alana has been a volunteer with federal corrections since 2000 as a facilitator for the Alternatives to Violence Project and as a citizen escort.She is a Criminology Instructor for Kwantlen Polytechnique University and Simon Fraser University and is currently a doctoral student in the Criminology Department at SFU. She is also a Research Assistant with the Centre for Education, Law and Society in the Faculty of Education at SFU.

Mari Ng Mizobe
Research Assistant

Mari Ng Mizobe is passionate about eradicating institutional oppressions, and building peaceful communities where each person and group is included and valued. She has a background in facilitation, international education, and diversity and equity, and her research interests include intergroup dialogue and peace education. In addition to contributing to CELS, she is a facilitator, coach and trainer for Soliya, a United Nations partner organization that brings college students from around the world into dialogue over difficult issues. Mari has a MA in Conflict Resolution and is currently a PhD student in Education (Languages, Cultures and Literacies) at Simon Fraser University.

Carol Myungdoek Suhr
Research Assistant

Carol Suhr is passionate in additional language education for children. She has extensive experience in ESL/EFL education for children, and trained newly employed instructors who came from overseas. In Korea, she worked as an EFL instructor, educational program coordinator and developer, a teacher trainer, and an assistant manager, primarily for an English-immersion private language school for children in PreK-4 grade level. Here in Canada, she recently finished her M.Ed. in Teaching English as Second/Foreign Language, and continues to work for ESL institutions for children as a supervisory staff, while pursuing a M.A. in Education (Curriculum & Instruction).

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Centre for Tourism Policy and Research**

2. Director of the Centre

Name: Peter Williams Phone Number: 778-782-3074

Expiry Date of Term as Director: July 1, 2014

Fax Number: 778-782-4968

Office Location: Rm 8261 TASC 1

Director's Email: peterw@sfu.ca

Web Address of Centre: http://www.rem.sfu.ca/tourism/

Generic Centre Email: http://www.rem.sfu.ca/

3. Revised Centre Description:

The Centre for Tourism Policy and Research (CTPR) is a graduate research centre established by Simon Fraser University in cooperation with the Province of British Columbia. It operates as a research pod within the University's School of Resource and Environmental Management. The Centre's membership is comprised of faculty members and graduate students conducting research related to tourism and recreation sustainable development issues. Its overall mission is to develop and disseminate knowledge that encourages more sustainable forms of tourism development.

To achieve its mission, the Centre:

- Provides a focal point for interdisciplinary graduate level studies and professional development related to tourism and recreation planning;
- Encourages and conducts policy, planning and management research that enhances the effective and sustained use of tourism and recreation resources; and
- Facilitates the distribution of leading edge tourism and recreation research findings through participation in the development and delivery of tourism seminars, workshops, conferences and publications

4. Centre Accomplishments in the Past Five Years.

Over the past five years the Centre and its members have played a significant role in generating research that is helping shape the policy and planning landscape for tourism in BC and elsewhere. Centre accomplishments include:

research counsel to graduate student members preparing major research reports/theses. The following sections summarize faculty member teaching assignments that extended beyond their normal lecturing workloads and involved Centre related areas of investigation.

Workshops / Conferences / Course Development
Centre members helped prepare, facilitate, or deliver components of over 17 courses/or workshops. These were typically conducted in conjunction with other academic and/or tourism partners. Especially high profile teaching initiatives included faculty members and in some cases graduate students developing and delivering:

- an innovative SFU based Undergraduate Semester in Dialogue focused on the Olympics;
- an SFU based field school program for the Executive MBA Program in Leisure and Tourism Management at the University of Salzburg (annually for 3 years);
- an SFU orchestrated 12th International Symposium on Society in Resource Management conference in conjunction with UBC (domestic and international delegates); and
- an SFU organized International Association of Scientific Experts in Tourism congress (primarily European delegates) in Whistler.

These initiatives provided valuable experience for Centre graduate students who participated in the development, management and learning opportunities associated with these events. All of the events noted heightened the profile of SFU, REM and the Centre for Tourism Policy and Research as a leading place for research and learning in matters related to tourism and outdoor recreation management.

Mentoring
Mentoring services provided by faculty members and other senior associates contributed to the learning experiences of many (~35) student members of the Centre over the past five years. For the most, these students engaged in the day to day 'learn by doing' research activities of the Centre Workshops, project team meetings, individual mentoring sessions, and opportunities to participate in the data collection or project development activities of other students working in the Centre's lab helped build their critical thinking, research design, analytical and report preparation capacities. In addition, the Centre's members also provided support services to students engaged in tourism related work in other SFU departments and other universities Mentoring services were offered to students in REM, Geography, Sustainability Community Development, Business Management at SFU, as well as students at UNBC, UBC, University of Canberra, University of Salzburg, University of Innsbruck, University of Biocca and University of St.Gallen during this period.

Community Service

As awareness of the Centre's initiatives has grown, so has interest in having its members present findings, discuss their research, sit on professional and /or academic organization boards and councils dealing with tourism related issues. The following section highlights

Membership
Because much of the Centre's activities are 'project driven', membership is dynamic and changes as opportunities for research and training emerge. Over the past five years the annual complement of members has averaged about 23 people. These are typically comprised of:

- 3 core faculty members (from REM and Geography);
- 3 other SFU faculty members (typically from REM) who become engaged in varying components of the Centre's research activities (e.g. supervising and mentoring students, collaborating on interdisciplinary research projects etc.) Over the past 5 years, about 10 different SFU faculty members have been involved in varying mentoring, supervising or teaching activities linked to the Centre's programming
- 12 master's and doctoral graduate students participating in research projects managed by the Centre's core faculty
- 3 research associates (typically former graduate students) assisting current students and faculty in the implementation of Centre projects
- 2 visiting scholars collaborating with the Centre's core faculty and students on a range of seminar, workshop and research initiatives for varying periods of time . Over the past five years these visiting scholars have come other parts of North America, Switzerland, Australia, Norway, Austria, Germany, Great Britain, and British Columbia.

The membership in the past year is listed in Appendix 1 (list of members).

7. Provide a summary of financial resources attracted and used, both from the *University* and *external* sources.

Resources attracted are in the form of contracts and grants typically assigned to individual Centre members or programs for projects that align with its teaching and /or research interests. Table 1 captures the lion's share of those contracts or grants awarded over the past 5 years.

External Resources
The Centre pursues grants and contracts primarily to support the research activities of its faculty members and graduate students. Over the past five years, direct external resources generated by research sponsors exceeded ($0.8 million Cdn.) In addition, several thousands of dollars were provided in the form of indirect 'contributions in kind' (e.g. accommodation, travel expenses, resource materials, mentoring, workshops, and per diems) to the Centre's graduate students. Without such support, the quality and variety of research projects undertaken by the Centre would not be as impressive. Table 1.provides a summary of the major direct research grants generated by Centre members for tourism related research over the past five years.

Financial Resources
The Centre's administrative budget for the past five years has been provided at the discretion of the Director of the School of Resource and Environmental Management. Each year, the Centre's operating budget of up to $8,500 is provided within the operating budget of the School of Resource and Environmental Management. However, actual expenditures are approximately $2,500 per year.

Space:
The Centre has a tourism lab that is the focal point for individual and group research projects. It is designed to accommodate up to 10 graduate students, but often handles more. Space is flexibly arranged to offer desks for designated graduate students, and accommodate research team meeting with other faculty members and visiting scholars.

University Personnel:
Secretarial and technical support is provided to the Centre on an as need basis at the discretion of the Director of the School of Resource and Environmental Management. Requests for such support are typically limited to administering contracts, payrolls and expense payments, as well as providing computer support services to research teams on an as needed basis.

Major Equipment: none

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

The Centre provides a much needed psychological and physical 'place' for meetings, dialogues and collaborations on tourism issues. While faculty researchers are able to conduct tourism research on their own, the collective synergy the Centre facilitates leads to the creative sharing of ideas, experiences, contacts, and resources that might not otherwise happen. Its reputation as a trusted and credible research centre attracts an ongoing:

- Pool of talented graduate students who are eager to help conduct research activities that individual faculty members might not otherwise be able to pursue on their own;
- Set of requests from public and non-government agencies seeking researchers to take on studies that might not otherwise come to the attention of individual faculty members
- Cadre of faculty members, research associates, and visiting scholars who provide their networks of contacts, logistical support systems, perspectives, funding strategies and other collaborations that may expedite individual research initiatives that might not otherwise be possible to get off the ground.
- Variety of research workshops, conference and seminar participation opportunities (e.g. invited presenters or organizers) that help build awareness of and promote the research interests and capacities of individual faculty members amongst funding organizations.

public and non-government funding agencies, the Centre will dedicate more time to developing closer ties with other organizations (including targeted international agencies) not currently engaged in the Centre's initiatives. In addition, further tourism related adjunct professor appointments will be made with the intent of bolstering research and job opportunities for the Centre's graduate students.

13. Provide an updated calendar description if different from the old listing on the first page.

The Centre for Tourism Policy and Research (CTPR) is a graduate research centre established by Simon Fraser University in cooperation with the Province of British Columbia. It operates as a research pod within the University's School of Resource and Environmental Management. The Centre's membership is comprised of faculty members and graduate students conducting research related to tourism and recreation sustainable development issues. Its overall mission is to develop and disseminate knowledge that encourages more sustainable forms of tourism development.
To achieve its mission, the Centre: provides a focal point for interdisciplinary graduate level studies and professional development related to tourism and recreation planning; encourages and conducts policy, planning and management research that enhances the effective and sustained use of tourism and recreation resources; and facilitates the distribution of leading edge tourism and recreation research findings through participation in the development and delivery of tourism seminars, workshops, conferences and publications

14. Outlook for the future and other comments, by the Director of the Centre:

Prospects for the Centre are promising. It continues to attract talented graduate students, foster worthwhile collaborations with a wide range of partners, and generate valuable research and learning opportunities for its member. It reputation and unique position as a trusted and reputable tourism research supplier is strong. Many of its past graduate students are now in influential positions with some of Canada's leading public and non-government organizations. As such, organizations external to the university are increasingly aware of the advantages associated with working with the Centre through a combination of student internships and co-op jobs, as well as collaborative research programs. They frequently seek the input and participation of faculty and students in workshops, forums and research assignments.

Future endeavors will focus on internationalizing the range of tourism projects undertaken by the Centre. Its members have gained much international recognition in the past five years, and that exposure should translate into international collaborations. Particularly good prospects exist to work with European and Australian organizations on research programs linked to tourism related climate change mitigation and adaptation strategies, product innovation, social media, protected areas management, amenity migration, destination governance research. Such links will provide invaluable opportunities for students to become involved in culturally different research contexts, and open doors to a broader range of future job opportunities. This will also create a

heightened public awareness of the relevance of the Centre's role in contributing to REM and SFU's mission.

Signature of the Director of the Centre/Institute

Peter L. Williams Date: Sept 21, 2011

Director

Faculty Dean – Centres Only

a. Comment on the Centre's performance: A strong performance during the past five years. The members of the Centre have pursued a clear set of objectives with excellent results. The plan to expand their research engagement internationally is a worthwhile pursuit.

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.): Resource commitments are adequate and I see no changes at the moment.

c. Recommendation: Strongly recommend. My congratulations to Peter and his colleagues for their sustained contributions.

Signature of the Faculty Dean or Vice-President, Research

John T. Pierce Date: Sept 21/2011

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date: _____

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RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Co-operative Resource Management Institute**

2. Director of the Centre

Name: Sean Cox
Expiry Date of Term as Director: August 31, 2013
Office Location: TASC 1 8241
Web Address of Centre: http://www.rem.sfu.ca/crmi
Generic Centre Email: N/A

Phone Number: 25778
Fax Number: 24968
Director's Email: spcox@sfu.ca
Secretary to Director: 23074

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

The Cooperative Resource Management Institute (CRMI) is a unit on the Burnaby campus that houses personnel from natural resource management agencies. The Institute can facilitate solutions to difficult multidisciplinary issues in resource management by providing an environment where personnel from different management agencies such as forestry, fisheries, and wildlife can work side-by-side along with Simon Fraser University faculty, graduate students, post-doctoral fellows, and research associates on a daily basis. The university benefits from greater concentration of expertise in environmental management on campus and from new opportunities and funding for multidisciplinary, collaborative research programs. Graduate students and other young scientists also gain valuable experience working with agency scientists. The agencies involved with the Institute benefit from cooperative work with SFU researchers, often on topics that would otherwise not have been investigated due to staff shortages in the agencies. The Institute has thereby proven to be an excellent example of the classic "win-win" situation.

4. Provide a detailed list of accomplishments of the Centre for the past five years.
Over the past five years, the Cooperative Resource Management Institute has been a focal point for collaborative interactions among SFU's faculty and graduate students and non-SFU organizations involved in environmental management. CRMI members built collaborative working relationships that made research more available to decision - makers and the public.

1

Membership
CRMI increased its membership from 15 in 2005 to 24 by 2009, including 17 SFU faculty members and 7 non-SFU faculty. New members were selected to expand the range of applied research represented in CRMI, as well the scope of inter-disciplinary research at SFU.

CRMI also increased socio-economic expertise on the SFU campus by adding Ajit Krishnaswamy from the Forests Research Extension Partnership (FORREX). Ajit was later joined in FORREX by extension specialist, Diane Boyd, who provided expertise in applied landscape ecology and conservation biology.

Research
Non-faculty members of CRMI from DFO and FORREX, who worked full-time on campus, played an important role in developing and supporting SFU's research capacity in fisheries science, forestry, fish-forestry interactions, and community-based management of forests, fisheries, and wildlife. Non-faculty members of CRMI maintain ongoing collaborations with SFU faculty in Resource and Environmental Management, Earth Sciences, Biological Sciences, and Statistics and Actuarial Sciences. In almost all cases, this applied research directly involves graduate students in research design, execution, publication, and public communications.

A total of eight research awards demonstrate the leading-edge applied research generated by CRMI. During the reporting period, CRMI faculty members Ken Lertzman, Randall Peterman, and Rick Routledge received prestigious awards for their research from the Ecological Society of America, the American Fisheries Society, the Statistical Society of Canada respectively. In 2009, CRMI non-faculty members Erland MacIsaac, David Patterson, Steven MacDonald, Neil Schubert, and Michael Bradford all received significant awards in recognition of the quality and importance of their research to Fisheries and Oceans Canada.

Teaching
CRMI has been a focal point for supervision and co-supervision of SFU graduate student researchers. In addition to the normal teaching and supervisory loads provided by SFU faculty members of CRMI, non-faculty members of CRMI supervise or co-supervise an average 6-10 SFU graduate students per year. This supervision provides critical applied context to student research that is unique to CRMI and SFU.

In addition to the normal teaching activities of SFU faculty, CRMI members also developed regional and national professional development and training programs in quantitative and qualitative research methods and techniques. These included

1. Statistical Analysis and Programming Workshops – Columbia Mountains Institute, Yukon Ministry of Environment, B.C. Ministry of Environment, Fisheries and Oceans Canada, and Kintama Research

2. Management Strategy Evaluation Workshops – Fisheries and Oceans Canada, Headquarters (Ottawa,ON) and Maritimes Region (Halifax, NS)
3. Risk Assessment and Decision Analysis – B.C. Ministry of Environment

Finally, non-faculty members of CRMI (Merran Hague) provided sessional teaching services for SFU calendar courses (e.g., REM 311).

Community Service

CRMI members provided a wide range of community service including:

1. Advisory Panels
    a. Cohen Commission of Enquiry into the Declines of Fraser River Sockeye Salmon
    b. DFO Stock Assessment Management Board
    c. DFO Technical Expertise in Stock Assessment
    d. Skeena Independent Science Review Panel
    e. BC Biodiversity Action Plan
    f. Canadian Spotted Owl Recovery Team
    g. Vancouver Parks Board
    h. Centre of Expertise for Aquatic Risk Assessment
    i. Alaska Dept of Fish and Game
    j. The Royal Society of Canada
    k. Ecotrust Canada

2. Statistical and Modelling Consulting Services
    a. B.C. Ministries of Parks and Environment
    b. Great Lakes Indian Fish and Wildlife Commission
    c. Minnesota Dept of Natural Resources
    d. Grand Canyon Monitoring and Research Center

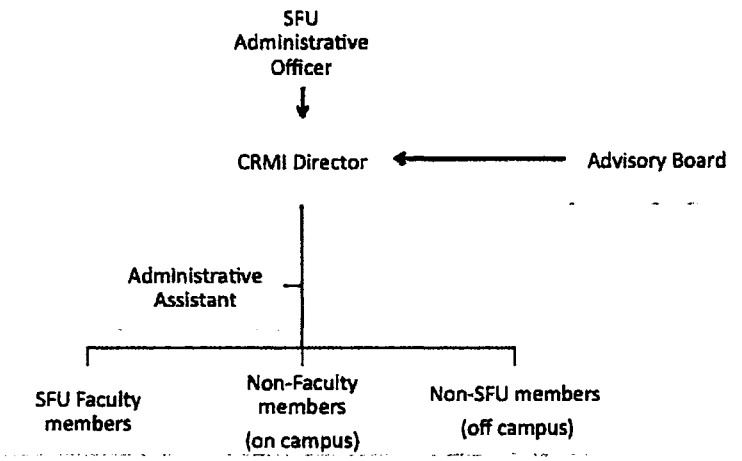
3. Fisheries Stock Assessment Review Panels
    a. DFO Pacific Science Advice Review Committee
    b. U.S. National Marine Fisheries Service
    c. Marine Stewardship Council

5. Has your Centre accomplished its goals?

CRMI's primary goal, *to create a community of resource and environmental management researchers on SFU's Burnaby campus,* has clearly been accomplished. The Institute has stimulated, encouraged, and enhanced cooperative research between faculty at Simon Fraser University and personnel in natural resource management agencies. The list of collaborative inter-disciplinary research projects is substantial and growing as SFU faculty increasingly partner with CRMI members from outside management agencies. As shown throughout this report, CRMI members have enhanced SFU's capacity in research, teaching,

and community outreach over and above what could be accomplished by SFU faculty alone. In almost all cases, CRMI researchers put university research to work in "real-world" contexts via CRMI's management agency research connections.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.



CRMI is led by an elected Director (3-year renewable term) and current membership (Appendix 1) consists of 17 SFU faculty and 7 non-faculty from outside Agencies. Several non-faculty members are housed on SFU's Burnaby campus. Agency membership consists of senior research scientists from Fisheries and Oceans Canada (DFO) and the Forum for Research and Extension in Natural Resources (FORREX).

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources.**

The CRMI operates from two externally funded accounts (Appendix 2): 21-139056 with a current balance of ($4372.95); and 13-875862 with a balance of $1507.08. External funding may be received from a variety of sources such as contributions from Agency members and Seminars by CRMI Members. The University does not provide CRMI any financial resources.

Members of the Institute often collaborate on research projects with individual accounts set up under the Principal and Co-investigators names for each grant.

8. Please identify the university resources, if any, provided to your Centre.

Space:
Offices are provided for members from outside Agencies: DFO and FORREX, including 77.5 m^2 in TASC 1 and two offices (6.7 m^2) in TASC 2.

Note that the above space allocation represents a 27% reduction from the original allocation in CRMI's former East Academic Annex location.

University Personnel:
The secretary is provided by the School of Resource and Environmental Management (Secretary to the Director's of REM, CRMI and CTPR).

Major Equipment:
None.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

The university has benefitted from greater concentration of expertise in environmental management on campus as well as new opportunities and funding for multidisciplinary, collaborative research programs. SFU and non-SFU members of CRMI work together to leverage support to attract high quality research, graduate students, and research associates to SFU.

CRMI enhances research over and above what can be accomplished by individual faculty members by:

1. Providing a critical mass of research expertise in resource and environmental management that may not be covered by SFU faculty (e.g., fish-forestry interactions, species-at-risk, salmon migration physiology, stock assessment, social aspects of forestry and fisheries);
2. Co-supervising graduate students by DFO and FORREX members of CRMI, which increases the number of opportunities for multidisciplinary, collaborative research programs;
3. Providing direct research funding and logistical support, including critical support for safe and productive graduate student research in remote areas;
4. Providing a local research network to enhance collaboration, research training, and funding opportunities.

10. Provide a rationale for the continuation of your Centre.

Continuation of CRMI ensures that SFU faculty, graduate students, and resource management agencies will continue to benefit from collaborative research and training in applied resource management issues. Non-SFU faculty from DFO and FORREX, in particular,

play an important role in graduate student research by providing expertise, resources, and logistical support that would not be available otherwise.

Over the next several years, DFO members of CRMI will likely represent the only applied research expertise in salmon population dynamics and management at SFU. The continuing presence and involvement of this group (via CRMI) in research on SFU's Burnaby campus is therefore critical if SFU is to meet the high demand for applied research and training on Pacific salmon population dynamics and management in the future.

There is growing recognition that resource management problems require multidisciplinary solutions. Centres such as CRMI help to meet this demand by providing research and training opportunities in which the distinctions between science, policy, and economics represent opportunities rather than barriers to sustainability solutions.

11. List your Centre's goals for the next five years.
Over the next five years, the goals of CRMI are to:

1. maintain our active community of resource and environmental management researchers on SFU's Burnaby campus;
2. expand CRMI's expertise in risk assessment for physical and biological systems to offset losses due to impending SFU faculty retirements.

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

We do not anticipate major organizational changes to CRMI upon renewal. However, as part of the move from East Academic Annex to TASC 1, CRMI accepted a 27% reduction in office and laboratory space. We hope to rectify this loss as soon as possible.

13. Provide an updated calendar description if different from the old listing on the first page.

14. Outlook for the future and other comments, by the Director of the Centre:

Since its inception 12 years ago, the Cooperative Resource Management Institute has been a focal point for collaborative interactions among SFU's faculty/graduate students and non-SFU organizations related to environmental management. The value to SFU, as well as the other member organizations, of such continued activities is evident from the material in this report. As a part of the new Faculty of Environment at SFU, CRMI members look forward to new opportunities to build collaborative working relationships and take advantage of FORREX's expertise in providing extension services that make our research more available to decision makers and the public. In the latter context, we anxiously await the appointment of a replacement for Diane Boyd in FORREX. We also will be seeking to rectify the 27% loss in space allocated to CRMI when the unit was moved to TASC1 in 2005 along with REM.

Signature of the Director of the Centre/Institute

Director _____ Date: 22 June 2011

Faculty Dean – Centres Only

a. Comment on the Centre's performance:

Innovative & excellent. A model marriage of applied research & community engagement.

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.): Additional space needed along with a staff member in FORREX to be replaced.

c. Recommendation: Renew

Signature of the Faculty Dean or Vice-President, Research

_____ Date: June 27/2011

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date: _____

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APPENDIX 1: Cooperative Resource Management Institute Membership List

SFU MEMBERS
3 year duration

Sean Cox (Director)	REM	spcox@sfu.ca
Frank Gobas	REM	gobas@sfu.ca
Wolfgang Haider	REM	whaider@sfu.ca
Ken Lertzman	REM	lertzman@sfu.ca
Randall Peterman	REM	peterman@sfu.ca
Evelyn Pinkerton	REM	epinkert@sfu.ca
Andy Cooper	REM	andrew_cooper@sfu.ca
Anne Saloman	REM	Anne_saloman@sfu.ca
Rick Routledge	Statistics & Actuarial Science	richard_routledge@sfu.ca
Carl Schwarz	Statistics & Actuarial Science	carl_schwarz@sfu.ca
John Clague	Earth Sciences	jclague@sfu.ca
Diana Allen	Earth Sciences	diana_allen@sfu.ca
Dana Lepofsky	Archaeology	dana_lepofsky@sfu.ca
John Reynolds	Biological Sciences	reynolds@sfu.ca
Isabelle Cote	Biological Sciences	imcote@sfu.ca
Nick Dulvy	Biological Sciences	nick_dulvy@sfu.ca

AGENCY (NON-SFU) MEMBERS
5 year duration

Mike Bradford	DFO	mike.bradford@dfo-mpo.gc.ca; bradfor@sfu.ca
Steve MacDonald	DFO	steve.macdonald@dfo-mpo.gc.ca
Erl MacIsaac	DFO	erland.macisaac@dfo-mpo.gc.ca; eamac@sfu.ca
Neil Schubert	DFO	neil.schubert@dfo-mpo.gc.ca
David Patterson	DFO	david.patterson@dfo-mpo.gc.ca
Daniel Selbie	DFO	Daniel.selbie@dfo-mpo.gc.ca
Ajit Krishnaswamy	FORREX	Ajit.krishnaswamy@forrex.org ; ajit_krishnaswamy@sfu.ca

APPENDIX 2

Acct	Description	Budget Original	Budget Adjustments	Total Budget	Mar-11 Cur.Month	Mar-11 YTD.Actual	OS Encumb.	Balance Available
Report Filter:	User: EMPELLI							
Fund: 25	Special Purpose Projects (SP)							
Project: 139056	CO-OP RESRCE MGMT BEST (CRMB)							
Revenue								
4115	Other Fedrl Grants&Contract Rev	0.00	0.00	0.00	0.00	-6900.00	0.00	6900.00
Subtotal		0.00	0.00	0.00	0.00	-6900.00	0.00	6900.00
Expense								
5172	Sals Underpaid Rm Amnts Cdn	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5911	Welfare Benefits	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6122	Field Travel Exp-Mileage or Inf	0.00	0.00	0.00	0.00	247.50	0.00	-247.50
6151	Invited Speakers Travel Exp	0.00	0.00	0.00	0.00	20.00	0.00	-20.00
6312	Materials and Supplies Expense	0.00	0.00	0.00	2049.41	7236.26	0.00	-7236.26
6313	Materials/Supplis-Resource	0.00	0.00	0.00	68.68	68.68	0.00	-68.68
6314	Software Purchase Costs	0.00	0.00	0.00	0.00	102.38	0.00	-102.38
6319	General Office Expenses	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6334	Courier/Mail-service Expense	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6341	Printing Paper & Duplic Costs	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6685	Computer Equipment Purchases	0.00	0.00	0.00	102.38	1680.93	0.00	-1680.93
6692	Custom Duty/Tax On Equip Purch	0.00	0.00	0.00	0.00	100.20	0.00	-100.20
8498	Budget Balance Forward	0.00	-1477.00	-1477.00	0.00	0.00	0.00	-1477.00
8814	Key Charges - Internal	0.00	0.00	0.00	60.00	90.00	0.00	-90.00
8871	Computing Services Charges	0.00	0.00	0.00	25.00	250.00	0.00	-250.00
Subtotal		0.00	-1477.00	-1477.00	2305.47	9795.95	0.00	-11272.95
Total		0.00	-1477.00	-1477.00	2305.47	2895.95	0.00	-4372.95
	Total - All Pages							

Acct	Description	Budget Original	Budget Adjustments	Total Budget	Mar-11 Cur.Month	Mar-11 YTD.Actuals	O/S Encumb.	Balance Available
Report Filter:	User: ENPHILLI							
Fund: 13	Internal Research (OR)							
Project: 875862	PETERMAN R-CO-OP RES MGMT INST							
Expenses								
7242	Catering & Service Costs	0.00	0.00	0.00	68.50	68.50	0.00	-68.50
8498	Budget Balance Forward	0.00	1575.58	1575.58	0.00	0.00	0.00	1575.58
Subtotal		0.00	1575.58	1575.58	68.50	68.50	0.00	1507.08
Total		0.00	1575.58	1575.58	68.50	68.50	0.00	1507.08
	Total - All Pages							

(9)

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Centre for Experimental and Constructive Mathematics**

2. Director of the Centre
Name: Michael Monagan
Phone Number:___(778) 782 4279_____
Expiry Date of Term as Director:_July 31, 2011__
Fax Number:___None_____
Office Location:_____K10501, Shrum Science_____
Director's Email:___mmonagan@cecm.sfu.ca_____
Web Address of Centre: ____www.cecm.sfu.ca_____
Generic Centre Email:___director@cecm.sfu.ca_____

1

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

The centre furthers research and education in computation in the mathematical sciences. The centre's activities include: participation in the training of graduate students in experimental and computational mathematics; provision of post doctoral fellowships in areas related to experimental and constructive mathematics; sponsorship of regular short term and long term research visitors to the centre; organization of regular colloquia and occasional conferences on advances in experimental and computational mathematics; providing access to computing resources and mathematical software packages (currently Maple and Magma); provision of tutorials and consulting assistance for faculty and graduate students at Simon Fraser University in the use of the centre's software and other computer algebra systems; establishment, development and maintenance of accessible software archives; collaboration with similar centres and appropriate individuals at other Canadian and foreign universities and commercial companies developing mathematical software. Such collaboration may include co-sponsorship of speakers, workshops and visitors, joint application for external research funds, exchange of software and expertise, establishment of a Canadian mathematical computation network. Subject to the director's approval, the centre's membership will be open to Simon Fraser University faculty, and post-doctoral and graduate students who are actively involved in mathematical computing. Associate membership will be available to faculty at other universities.

4.Provide a detailed list of accomplishments of the Centre for the past five years.

•The centre has continued to provide access to the latest version of Maple on the CECM network (Maple 15 is available on 40 cores) and now provides access to Magma on the CECM network (Magma 2.17 is available on 30 cores).

•The centre has continued to host the development version of Maple on two servers. This enables Maple projects to install Maple software (programs, tests and documentation) into the Maple library under contract. For example, Borwein and Monagan's MITACS project (1999-2012) has contributed mathematical algorithms to the Maple library in each year of the project. The project has brought in approximately $325,000 in NCE funding and $210,000 in industry funding over the last five years to faculty at SFU. Most of this money has been used for graduate student support. Students of Borwein, Goddyn, Lisonek, Mishna and Monagan have been supported.

•The centre has provided some formal opportunities for training in the use of mathematical software. For example:

In August 2006 Monagan gave a one week course "Teaching and doing mathematics with Maple".
In October 2007 Dr. Jürgen Gerhard of Maplesoft gave a one day Maple training session.
In 2008 Bruin co-organized "Sage Days" - a graduate workshop on graphics and visualization (using Sage).

•The centre has reduced its operating costs from $28,000 per year in 2006 to below $4,000 per year in 2009 and 2010 by (1) eliminating the need for secretarial support by paying IRMACS to run CECM day event and offloading accounting and reporting onto the director, and (2) rationalizing phone, hardware maintenance, software license, and backup expenses.

•The centre budgeted for $8,000 in income per year to pay for operating costs without charging a membership fee and without receiving any operating money from the university. We received $39,900 in direct income [see section 7 below] and $9,000 from the department to refurbish the Colab (P8493) in 2007. We are close to meeting this goal for the past 6 years.

•The centre sought to enhance the quality, participation and value of our annual CECM Day workshop on computational mathematics that Jon Borwein started. The following is a list of improvements made.

3

•Hold event at IRMACS instead of the Halpern Centre
•Produce event poster; handle registration on-line
•Offer students, both undergraduate and graduate, and PDFs, an opportunity to present their research in the form of poster presentations.
•Offer $500 in prize money for the best undergraduate and graduate student posters.
•Include lunch in registration fee ($30-$50)
•Invite speakers from outside the CECM and outside of SFU
•Give formal software demonstrations, e.g. new version of Maple, Sage
•We have always invited all members of the department to attend. In 2009 we renamed CECM day to be CMD day (Computational Mathematics Day) to increase participation from the department.
•In 2010 and 2011 we asked a member of applied and computational mathematics to co-organize the event to increase participation from applied mathematics.

Here are the results of that effort.
The event has grown to become a department wide event.

	#participants	#posters	#talks	Organizer
2003	45	15	7	Monagan
2004	NA	9	5	Monagan
2005	43	13	6	Monagan
2006	27	12	4	Monagan
2007	31	13	5	Monagan
2009	33	12	6	Mishna & Monagan
2010	56	25	6	Mishna & Williams
2011	52	25	5	Jedwab & Wittenberg

•The centre has continued to build a research environment which is attractive and conducive to doing research in and developing software for experimental and constructive mathematics.

• P8493, one of the two rooms in the CECM, the "Colab", was renovated in 2007 to provide desk space for six graduate students with desktop computers - increasing the number of people that can be seated in the CECM from 12 to 18. Typically 10 to 12 of these are occupied by graduate students which leaves 6 to 8 "drop-in" spaces for faculty, project research staff, summer USRAs and visitors. Some stats for space usage:

	Undergrad	Graduate	PDF/RA/visitor
2006-2007	2	5	3
2007-2008	5	7	4
2008-2009	1	11	3

4

2009-2010	2	10	3
2010-2011	4	11	4
2011-	6	8	2

- We've made available copies of various journals/periodicals in the CECM library including "Notices of the AMS", "Communications of the ACM", as well as Macleans, the Economist, to make it an attractive place for faculty and visitors.
- Continuously upgrade desktops in lab (8 in the last five years).
- Provide access to other software e.g. Clik, Mathematica, Sage as needed by members.

•The center has provided training for the following students over the period. Undergraduate students listed either held a NSERC fellowship or a MITACS fellowship.

Undergrads: Raul Aliaga (2007), Andrew Arnold (2007), Jaiganesh Balasundaram (2011), Bill Bao (2009), Alejandro Erickson (2006, 2007), Bradley Jones (2010, 2011), Valerie Chong (2010), Thea Gegenberg (2007), Richard Lei (2011), Simon Lo (2006), Jamie Lutley (2007), Rosemary McCloskey (2011), Steve Melczer (2010, 2011), Shraddha Ramesh (2011), Robert Shih (2010), Julian Sahasrabudhe (2009), Asif Zaman (2008, 2009)

MSc: Cory Ahn, Andrew Arnold, Aki Avis, Liang Chen, Kseniya Garaschuk, Soo Go, Mahdi Javadi, Stephen Kieffer, Tristan Kim, Simon Lo, Alex Molnar, Chelsea Richards, Paul Vrbik, Suling Yang, Hui Yi Lu

PhD: Tom Boothby, Kevin Doerksen, Mohammad Ghebleh, Mahdi Javadi, Mahdad Khatarinejad-Fard, Lucas Jiaxiong, Alan Meichsner, James Ratcliffe

PDF/RA: Vahid Dabbaghian, Eric Fusy, Ha Le, Roman Pearce

5.Has your Centre accomplished its goals?

Yes, many of the goals, as stated in the Centre Description in Section 3, have been met. We comment on each goal here.

•*Participation in the training of graduate students in experimental and computational mathematics;*

The centre has provided many training opportunities for graduate and also undergraduate students. See section 4.

•*Provision of post doctoral fellowships in areas related to experimental and constructive mathematics;*

The centre does not have, and never has had a budget that could endow a PDF. It has hosted and supported the research of PDFs who have been funded through MITACS and NSERC. In section 13, we have updated the Calendar Description to clarify this.

•*Sponsorship of regular short term and long term research visitors to the centre;*

The centre regularly hosts visitors and has provided some funds for travel expenses.

•*Organization of regular colloquia and occasional conferences on advances in experimental and computational mathematics;*

Members of the centre organize, or help organize, three regular colloquia (in Computer Algebra, Discrete Mathematics and Number Theory) and an annual one day workshop.

•*Providing access to computing resources and mathematical software packages (currently Maple and Magma);*

As noted in section 4, the centre has done this.

•*Provision of tutorials and consulting assistance for faculty and graduate students at Simon Fraser University in the use of the centre's software and other computer algebra systems;*

As noted in section 4, the centre has provided some formal tutorials. Members regularly provide help with Maple and Magma.

•*Establishment, development and maintenance of accessible software archives;*

As noted in section 4, the center hosts and maintains the development version of Maple. It also hosts and maintains its own web server on which members have put their preprints and software.

•*Collaboration with similar centres and appropriate individuals at other Canadian and foreign universities and commercial companies developing mathematical software.*

Collaboration has taken place with the following research groups;

The Ontario Research Centre for Computer Algebra (ORCCA),
The Magma group at the University of Sydney, Australia,
The Math group at Maplesoft, Ontario
The Symbolic Computation Group at the University of Waterloo,
The Algorithms group at INRIA, Rocquencourt, France.
The Security, Crytology and Transmissions (SECRET) project at INRIA, Rocquencourt, France, and
The SAGE project at the University of Washington.

6.Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

Director: Michael Monagan (term has expired)

Associate Director: Luis Goddyn

Steering committee:
Peter Borwein, Nils Bruin, Imin Chen, Stephen Choi, Luis Goddyn, Jonathan Jedwab, Peter Lisonek, Marni Mishna, Mike Monagan, Mike Sollanych.

Membership: see attached document

7.Provide a summary of financial resources attracted and used, both from the **University** and **external sources**. (Attached a separate document, if necessary.)

Listed here is all income that appears in CECM accounts. See attached document for our account balance statements.

Period	Source and Purpose	Amount
2006-2007	CECM day registration fees.	$1000
2007-2008	Maplesoft corporate gift to CECM	$8000
	Dean's portion of MITACS contract overhead	$5000
	CECM day registration fees.	$1400
2008-2009	Dean's portion of MITACS contract overhead	$5000
2009-2010	Maplesoft gift to CECM for operations	$4000
	Dean's portion of MITACS contract overhead	$4000
2010-2011	NONE	
2011-present	Dean's portion of MITACS contract overhead	$4000
	Dean's portion of MITACS contract overhead	$4500
	Maplesoft matching gift for NSERC equipment	$3000
	Total	$39,900

Below I list other contributions not accounted for above or under 8.

(1) The department contributed just over $9,000 in the spring of 2007 to convert what was Jon Borwein's "Colab" into space suitable for 6 graduate students. This included new furniture (5 desks, 6 chairs, cubicle partitions) and a repainting of the walls from a dark blue to white. Two new desktop computers were paid for out of the CECM budget.

(2) Faculty have contributed five desktop computers (2 recycled Sun 150s, and 3 new Dells) to the CECM lab over the period, a contribution value of about $7,500.

8. Please identify the university resources, if any, provided to your Centre.

Space:
P8495 and P8493 is the CECM lab. It has three main areas, each with desks for 6 people arranged in cubicles. Typically there are 10-12 graduate students, mostly from mathematics, and one or two from computing science. This leaves 6-8 desks for visitors, researchers, NSERC undergraduate USRAs, and faculty who work in the lab.

University Personnel:
The university paid for Glenn Davies (40%) from 2006 to January 2009, then John Hebron (20%) from February 2010 to April 2010, and Mike Sollanych (20%) since May 2010 to look after the computing facilities in the CECM and in faculty member offices.
At this time Mike Sollanych of the NSG has the primary responsibility for looking after our computing facilities. Mike also looks after the computing equipment for staff and faculty in the Mathematics and Statistics departments. His office is in the CECM lab. Mike has served us very well.

We have no direct secretarial support and do not use departmental resources. Michael Monagan has looked after expenses, accounts, reports, web site, and non-computing day to day operations of the centre as needed.

Major Equipment:
We currently have 7 servers, 4 of which were purchased through faculty NSERC Equipment grants of Bruin (1), Chen (1), and Monagan (2) and 3 by the CECM. The servers are housed in P8495.3, a small machine room accessible from inside the CECM lab. This room is air conditioned. We are about to purchase a 48 core shared memory machine through an NSERC equipment grant for $15,000.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

To run major computational research projects we need a machine room to house dedicated compute servers, sometimes with restricted access, and we need laboratory space to house project research personnel [research associates, student research assistants, PDFs] and a place for meeting with company personnel. We could not have run the MITACS project of Borwein and Monagan without such a facility.

To attract visitors and also new graduate students, we need a place, a lab, a home for them which provides access to mathematical software and a place to sit, work and meet with faculty. The CECM lab is the only collaborative research space in the department which is equipped with computing facilities and whiteboards.

The centre has provided access to various software research packages [Maple, Magma, Sage] on a significant compute facility [currently 40 cores]. This provides faculty and students with a sizable compute capability within the faculty for experimental research in mathematics. For example, the computational resources have been used to search for 3-phase Golay triads (Jedwab, Avis, 2010), Kloosterman zeroes (Lisonek, Kim, 2011), and cyclotomic polynomials of large height (Monagan, Arnold, 2010). With the purchase of a new 48 core platform, this will double the CECMs compute cycles at no additional operating cost or energy consumption.

We have the capability to host small workshops. For example, workshops related to Maple projects, Magma, and Sage development. Although a workshop would meet in a seminar room for presentations, research work can take place in the CECM lab.

There is a critical mass of expertise in the centre so that students may get help from other students and faculty with software. Obviously this includes mathematical software but also LaTeX which we and our students use for the preparation of research papers, slides for talks, theses and posters.

See also answers in question 10 and 11 below.

~~10~~

10. Provide a rationale for the continuation of your Centre.

•To continue to provide computational resources to enable experimental research in mathematics (algebra, number theory, discrete mathematics, combinatorics and cryptography).

•To continue to provide access to the Maple and Magma computer algebra systems on the CECM network, and local technical expertise in their usage. This is a national resource. Members also provide expertise in other software packages:

Sage – a new open source computer algebra system
Cilk – a parallel version of C developed at MIT
nauty – Brendan McKay's graph theory package
GAP – a package for computations with finite groups
LaTeX – for writing research papers, theses, posters, and
Mathematica – a general purpose system

•The CECM provides a computing network, separate from the departments, with access to significant number of compute cores on servers and desktops running Linux. The following faculty in the department use the CECM as their home network:
Borwein, Bruin, Chauve, Chen, Choi, Goddyn, Lisonek, Mishna, Monagan
Having a separate network has many advantages. For example, we were able to setup a server for Sage so that Jamie Mulholland could run a course "MATH 302: **Adventures in Group Theory: Rubiks Cube and Other Mathematical Toys.**" Another example, we can easily create group web pages and set up preprint servers, which is not possible with the department's setup.

•To continue to provide a lab, a "mathematics laboratory" where students, research staff, faculty, visiting faculty, PDFs, and industry personnel can meet and work in.

•To continue to organize and hold an annual workshop on computational mathematics and to provide funds for invited speakers, poster prizes, etc. in support of this workshop.

•Having a centre attracts visitors who then give talks and contribute to our seminars.

•To provide a website where members can easily place software, slides of talks, publications, posters, project descriptions, etc. The CECM website is referenced in printed publications. It is of benefit to CECM members that the website has remained stable since 2000. Most members use the CECM website for their home page, not the departments.

•To provide computing infrastructure to support the development (programming and documentation of) mathematical software for inclusion in Magma, Maple and Sage. And thereby continue to enable contribution of software (Maple, C, Magma and Sage) to the mathematics community.

11. List your Centre's goals for the next five years.

The primary goals for the centre are explicitly listed in the updated Calendar Description in Section 13. We elaborated on some in "Section 10 Provide a rationale for the continuation of your Centre." We comment further here on:

Provision of tutorials and consulting assistance for faculty and graduate students at Simon Fraser University in the use of the centre's software and other computer algebra systems;

We wish to improve the provision for instruction in the usage of software for faculty and students. In the preparation of this document, we talked about providing introductory tutorials in the usage of Magma. Also, Dr. Jürgen Gerhard, head of the Math group at Maplesoft, plans to visit October 3-5, 2011 to provide instruction for Maple software development.

12.Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

NONE

~~12~~

13. Provide an updated calendar description if different from the old listing on the first page.

The centre furthers research and education in computation in the mathematical sciences. The centre's activities include: participation in the training of graduate students and undergraduate students in experimental and computational mathematics; support for post doctoral fellows in areas related to experimental and computational mathematics; sponsorship of regular short term and long term research visitors to the centre; organization of regular colloquia and occasional conferences on advances in experimental and computational mathematics; providing access to computing resources and mathematical software packages (currently Maple, Magma and Sage); development and contribution of mathematical software to the scientific community; provision of tutorials and consulting assistance for faculty and graduate students at Simon Fraser University in the use of the centre's software and other computer algebra systems; establishment, development and maintenance of accessible software archives; collaboration with similar centres and appropriate individuals at other Canadian and foreign universities and commercial companies developing mathematical software. Such collaboration may include co-sponsorship of speakers, workshops and visitors, joint application for external research funds, and exchange of software and expertise. Subject to the director's approval, the centre's membership will be open to Simon Fraser University faculty, and post-doctoral and graduate students who are actively involved in mathematical computing. Associate membership will be available to faculty at other universities.

14.Outlook for the future and other comments, by the Director of the Centre:

I and the members of the CECM are grateful to the university and Jon Borwein for the CECM lab space. It has become a wonderful place to meet for research interaction between faculty, students and visitors. It is just the right size. Many of our faculty members go down to the lab daily for coffee and to work with our students. It is in the lab that we meet and interact. I do want to say something about our finances, the size of our community, and what our computing capability will look like in the next five years.

Finances: The CECM was established by Jon Borwein in 1992 and funded by the Dean of Science until circa 2002. Since then, as an established centre at SFU, we have run the centre with no base operating budget from the Dean or the university. This meant we needed to raise our own funds and reduce operating costs (the main implication being that we could no longer pay a salaried

employee to "run" the centre but would need to do administrative tasks ourselves.) We have reduced our base operating costs from $28,000 in 2006 to under $4,000 in 2009 and 2010 [see account statements]. Additional money is used to purchase new equipment, pay for travel expenses of visitors and support the annual workshop. Our source of income has been the Dean's portion of MITACS and other university contract overhead and corporate donations from Maplesoft to the centre for operating costs (and this year for matching money for equipment purchase), averaging about $7000 per year. At current operating costs, and our current account balances, I expect that we will manage for the next five years with this model. The relationship between the CECM and Maplesoft is good and I know Maplesoft will continue to support us.

Community: We are in one sense too successful. Whereas we used to hold one "CECM seminar" that we all attended, we grew and now have three seminars which reflect our diverse mathematical interests. The seminars are no longer "CECM" seminars as they have attracted many other non-CECM faculty and students from the department and also from UBC. This does pose a problem. We do not *all* regularly meet together. What does bring us together is our common interest in the mathematical computations that each of us is doing, and the application and development of mathematical software packages for research and education. For example, two of our faculty, one from computational algebra, the other from discrete mathematics, together with nine of our students, designed and implemented Maple's new graph theory package. We represent a national collective expertise in the usage *and development* of Maple, Magma, and Sage. We need to foster this by, for example, regularly sharing our knowledge of these systems with one another. I believe that there will be many more opportunities for such collaborative research and development projects. For example, Maplesoft has also asked us to develop a new package for computations in finite groups and Goddyn is starting a new project in geometric optimization.

Computing Equipment: We are in the process of purchasing a new file server [Dell 310] and a new compute server [Dell 815]. [We have quotes for these but I wish to wait for the new Bulldozer CPU that will be released by AMD later this month before making a final decision.] We plan to consolidate our servers from 7 (4 compute, 3 systems) to 5 (3 compute, 2 systems). This will see us through the next five years.

14. Signature of the Director of the Centre/Institute

Director M.B. Monagan Date: Nov 21, 2011

Faculty Dean - Centres Only

a. Comment on the Centre's performance:

This Centre has been very successful, and shows the promise of continuing to be so. The members achieve an impressive operation with minimal resources – most commendable.

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

Space and funding will continue at the current levels.

c. Recommendation:

I recommend renewal for another 5 years.

Signature of the Faculty Dean or Vice-President, Research

_____ Date: 22 NOV 2011

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):

c. Recommendation for renewal:

Signature of the Vice-President, Research

_____ Date: _____

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CECM Membership

Membership is divided into permanent members, associate members, and student members. Permanent members include SFU faculty and CECM staff. Associate members include faculty and researchers from other institutions who have visited the CECM, or previous permant members who have moved to another institution. The CECM web page

`http://www.cecm.sfu.ca/people/index.shtml`

maintains a list of current members and past members. The list of permanent members (updated September 2011) is below.

Table 1: Permanent members, 2011

Name	position	department
J. Bell	faculty	Mathematics, SFU
J. Borwein	faculty (founding director)	Mathematics, Newcastle, Australia
P. Borwein	faculty	Mathematics, SFU
S. Braham	adjunct faculty	Communications, SFU
N. Bruin	faculty	Mathematics, SFU
J. Chang	past manager	Physics, SFU
C. Chauve	faculty	Mathematics, SFU
I. Chen	faculty	Mathematics, SFU
S. Choi	faculty	Mathematics, SFU
L. Goddyn	faculty (associate director)	Mathematics, SFU
J. Hebron	past faculty past sysadmin	NSG, SFU
J. Jedwab	faculty	Mathematics, SFU
L. Joergenson	past manager past sysadmin	Industry
P. Lisonek	faculty	Mathematics, SFU
M. Mishna	faculty	Mathematics, SFU
M. Monagan	faculty (director)	Mathematics, SFU
B. Mohar	faculty	Mathematics, SFU
M. Solannych	sysadmin	NSG, SGU
M. Trummer	faculty	Mathematics, SFU

Associate Members (see webpage for institution)

Peter Anderson, David Bailey, Heinz Bauschke, David Borwein, Douglas Bowman, David Bradley, David Broadhurst, Morton Brons, Peter Cass, Rustum Choksi, Arjeh Cohen, Alan Cooper, Robert Corless, Tamas Erdelyi, Roland Girgensohn, Arvind Gupta, Kartherine Heinrich, Poul Hjorth, Robert Israel, Ray Jennings, Alejandro Jofre, Yasumasa Kanada, Lee Keener, Steve Kloster, Ulrich Kortenkamp, Alistair Lachlan, Dennis Langdeau, June Lester, Richard Lockhart, David Muraki, Larry Nazareth, Dominikus Noll, John Ogilvie, Greg Reid, Julian Revalski, Sinai Robins, Colin Rust, Rob Scharein, Nathalie Sinclair, Nessim Tariq, Julie Tomlie, Ljiljana Trajkovic, Jon Vanderwerff, Carolyn Watters, Sheldon Yang, Lily Yen.

Student Members [2011]

Cory Ahn, Andrew Arnold, Jaiganesh Balasundaram, Tom Boothby, Soo Go, Mahdi Javadi, Lucas Jiaxiong, Bradley Jones, Steven Kieffer, Yung-Jun (Tristan) Kim, Rosemary McCloskery, Ryan McMahon, Stephen Melczer, Roman Pearce, Shraddha Ramesh.

Operating statement by account
13-875890 is the CECM operating account
21-210240 is our Maple account (donations from Maplesoft).

Year 1 April 2006 to March 2007

Account	13-875890	21-210420	Total
Opening Balance	$32,904.84	$11,500.00	$44,404.84
+ Income	$1,000.00	0.00	+$ 1,000.00
- Expenses	$26,170.13	$2,624.28	-$28,794.41
= Balance	$7,734.71	$8,875.72	=$16,610.43

Year 2 April 2007 to March 2008

Account	13-875890	21-210240	Total
Opening balance	$7,734.71	$8,875.72	$16,610.43
+ Income	$6,400.00	$8,000.00	+$14,400.00
- Expenses	$13,740.28	$8,160.23	-$21,900.51
= Balance	$394.43	$8,715.49	=$ 9,109.92

Year 3 April 2008 to March 2009

Account	13-875890	21-210240	Total
Opening balance	$394.43	$8,715.49	$ 9,109.92
+ Income	$5,000.00	0.00	$ 5,000.00
- Expenses	$4,099.64	$2,891.29	$ 6,990.93
= Balance	$1,294.79	$5,824.20	$ 7,118.99

Year 4 April 2009 to March 2010

Account	13-875890	21-210240	Total
Opening balance	$1,294.79	$5,824.32	$ 7,119.11
+ Income	$5,300.00	$4,000.00	$ 9,300.00
- Expenses	$3,418.06	$ 392.40	$ 3,810.46
= Balance	$3,176.73	$9,431.91	$12,849.97

Year 5 April 2010 to March 2011

Account	13-875890	21-210240	Total
Opening balance	$3,176.73	$9,431.91	$12,608.64
+ Income	0.00	$ 0.00	$ 0.00
- Expenses	$3,070.34	$ 275.80	$ 3,346.14
= Balance	$ 106.39	$9,156.11	$ 9,262.50

Year current April 2011 to July 2011

Account	13-875890	21-210240	Total
Opening balance	$ 106.39	$9,156.11	$ 9,262.50
+ Income	$8,500.00(1)	$ 0.00	$ 8,500.00
- Expenses	$ 360.33	$ 0.00	$ 360.33
= Balance	$8,246.06(2)	$9,156.11	$17,402.17

Notes (1) $4,000 is from a contract from previous year.
(2) $3,000 is allocated for equipment purchase

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Pacific Institute for the Mathematical Sciences (PIMS)**

2. Director of the Centre

Name: **Alejandro Adem – PIMS Director**

Phone Number: 604 822 3922 Fax Number: 604 822 0883

Expiry Date of Term as Director: June 30, 2013 (5-year renewable term)

Office Location: 201 – 1933 West Mall, UBC, Vancouver, BC, V6T 1Z2

Director's Email: adem@pims.math.ca

Name: **Steve Ruuth – PIMS-SFU Site Director**

Phone Number: 778 782 4452 Fax Number: 778 782 4947

Expiry Date of Term as PIMS-SFU Site Director: June 30, 2011

Office Location: 10537, Department of Mathematics, SFU, Burnaby, BC, V5A 1S6

Director's Email: sruuth@sfu.ca

Web Address of Centre: www.pims.math.ca

Generic Centre Email: reception@pims.math.ca

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

The Pacific Institute for the Mathematical Sciences (PIMS) is dedicated to promoting all aspects of the mathematical sciences by stimulating, coordinating and facilitating the activities of mathematical and computational scientists. This is achieved by promoting research in mathematical sciences areas, initiating and promoting mathematics education at all levels: K-12 and university, initiating collaborations and strengthening ties between mathematical scientists in the academic community and those in the industrial, business and government sectors, training of highly qualified personnel for academic and industrial employment, and developing new technologies to support research, communication and training in the mathematical sciences. Through the strength and vitality of its programs, PIMS is able to serve the mathematical sciences community as a catalyst in many areas of significance: communication and dissemination of mathematical ideas through public outreach, mathematical education and training at all school levels, and creation of strong mathematical partnerships and links. PIMS involves scientists in several faculties at

Simon Fraser University faculties including the Faculties of Science, Applied Sciences, and Education. The PIMS community includes specialists in mathematics, statistics, computer science, mathematical physics, biology, chemistry, economics, operations research, management, engineering, and other fields involving mathematical methods. In addition, PIMS involves teachers in the mathematical sciences at all levels. PIMS-SFU is the Simon Fraser University representative of PIMS and shares the goals and ideals of PIMS generally while also meeting the specific needs of the mathematical sciences community at this University.

4. Provide a detailed list of accomplishments of the Centre for the past five years.

PIMS is a very active institute. Please see PIMS online Annual Reports, produced as part of the institute's reporting to NSERC, for full information on PIMS activities and accomplishments since 1997
http://www.pims.math.ca/resources/publications/annual-reports

PIMS has co-hosted and organized many activities at SFU over the past five years. Notable events include PIMS Industrial Problem Solving Workshop & Graduate Industrial Mathematical Modelling Camp, and the Sequences & Codes Conference in 2006; the Frontiers in Biophysics, and Statistical Distributions & Models conferences in 2007; the Mathematical Interests of Peter Borwein, and Mathematical Graphics & Visualization conferences in 2008; Statistics in Industry & Technology, and Statistical Methods for Dynamic Systems conferences in 2009; and the Actuarial Research conference, and Number Theory activities connected to PIMS Collaborative Research Group in 2010. Ongoing support is provided to the CSC Distinguished Lecture Series and weekly seminars. Highlights of the 2011 program include the Computational & Analytical Mathematics Conference, Waves 2011 and the 11th International Conference on Logic Programming & Nonmonotonic Reasoning. PIMS-SFU also has an important role in PIMS education and outreach program, hosting such events as A Taste of Pi, Changing the Culture, SFU Math Camps, and Aboriginal mentorship programs.

The PIMS-SFU Site Office has welcomed 19 PIMS Post-Docs and 15 student research assistants since 2006. Currently, 2 students at SFU receive stipends from PIMS as a result of their participation in PIMS International Graduate Training Centre in Mathematical Biology.

Since 2006, a total of over $1.1m has been transferred from PIMS-Central to PIMS-SFU as funding for PIMS activities and Highly Qualified Personnel based at SFU.

5. Has your Centre accomplished its goals?

PIMS is a highly successful mathematical sciences institute that has received stellar reviews and long-term funding from NSERC, as well as support from the provincial governments, and international funding agencies such as the US National Science Foundation and the French CNRS. We have accomplished our goals of enhancing the research and educational profile of the mathematical sciences throughout Western Canada, providing crucial support for thematic activities, training of highly qualified personnel and establishing meaningful collaborations between researchers in the region, as well as enabling distinguished international academics to visit. SFU, as a founding member of the PIMS consortium, has benefited significantly from all of our programs over the past five years.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

PIMS was founded in 1996 by a consortium of five universities in Alberta and British Columbia (the University of Alberta, the University of Calgary, the University of British Columbia, Simon Fraser University and the University of Victoria). The University of Washington, the University of Regina, and the University of Saskatchewan have since joined as full members, and the University of Lethbridge, Portland State University and the University of Northern British Columbia as affiliated universities.

PIMS does not have a membership list of individuals as such. Instead, all faculty and students at PIMS member institutions, and participants at PIMS-sponsored events are considered to be members of the PIMS community.

PIMS central office is at the University of British Columbia, with a PIMS site office and a Site Director local to each of the eight major universities in Alberta, British Columbia, Saskatchewan and Washington State. The Site Director facilitates local opportunities, while the PIMS site office provides administrative assistance for organizing local events. This distributed structure renders it quite unique, involving strong local site offices and activities, and allowing PIMS to have a broad impact across Western Canada and beyond.

A Board of Directors oversees the administration of PIMS, with membership consisting of the VP Research from each of the member universities, as well as distinguished scientists and representatives from industry. An independent Scientific Review Panel composed of internationally renowned mathematical scientists assesses proposals for scientific events and programs.

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources.** (Attached a separate document, if necessary.)

The following shows a summary of PIMS annual budgets since financial year 2007-2008.

PIMS Budgets Summary FY 0708 - 1112

2/18/2011

Revenue		2007-2008 Reconciled Actual	2008-2009 Reconciled Actual	2009-2010 Reconciled Actual	2010-2011 Budgeted	2011-2012 Budgeted	Memo
	NSERC	1,023,100	1,100,000	1,100,000	1,100,000	1,100,000	*Scientific-related expenses (including salaries of scientific personnel)*
	Partner Contributions	610,384	864,135	753,734	672,560	688,110	*General operating funds (only restricted by university guidelines)*
	- University of BC	399,769	385,109	353,992	274,700	290,450	
	- Simon Fraser University	80,000	80,000	80,000	80,000	80,000	
	- University of Victoria	66,600	66,600	66,600	66,600	66,600	
	- University of Alberta	70,000	155,400	77,700	77,700	77,700	
	- University of Calgary	67,710	67,710	67,710	67,710	67,710	*Partner breakdown only - not included in total below*
	- University of Washington	10,567	21,243	13,215	11,100	11,100	
	- University of Lethbridge	5,550	5,550	5,550	5,550	5,550	
	- Portland State University	1,863	3,973	4,567	4,000	4,000	
	- University of Regina	8,325	41,050	35,000	35,000	35,000	
	- University of Saskatchewan	0	37,500	50,000	50,000	50,000	
	Alberta AE & T	401,000	373,350	0	400,000	450,000	*Restricted to use in Alberta only*
	- University of Alberta	200,500	196,500	0	200,000	230,000	*AE&T breakdown only - not included in total below*
	- University of Calgary	200,500	176,850	0	200,000	220,000	
	Director's Research Support Fund	0	0	0	97,500	0	*Was made available as contingency funding if required*
	UBC - NCE	127,805	127,805	0	0	0	*For infrastructure and salaries only*
	SFU - NCE	42,500	42,500	0	0	0	*For infrastructure and salaries only*
	Infrastructure	41,797	32,164	0	40,000	0	*For infrastructure and salaries only*
	Donations	16,700	46,550	35,340	35,000	35,000	*Restricted by donor request*
	BC Government for First Nations activities	130,000	40,000	0	0	0	
	BC Government for HQP & IGTC	60,000	0	0	0	0	
	BC Government for NPCDS project	20,000	20,000	0	0	0	
	BC Government for IGTC Fellowships	0	60,000	0	0	0	
	BC Government for Year of Science activities	0	0	0	0	8,000	
	Government of Saskachewan for IPSW 08 Regis	0	50,000	0	0	0	
	Agence Nationale pour la Recherche (ANR)	0	30,000	0	0	0	
	Etudes et Prod. Schlumberger grant - Frigaard	70,000	70,000	50,000	70,000	0	
	Clay Institute grant - Carrell	20,000	20,000	0	0	0	
	Alberta Sustainable Resource Development	75,000	75,000	0	0	0	
	Conference Registration	45,651	51,773	148,502	80,000	25,000	
	Anticipated funds (other sources)	109,413	442,322	182,325	25,000	65,500	*From various sources and is largely unpredictable*
	Urban Aboriginal Strategy (Federal Interlocutor)	0	43,470	87,180	0	0	*For Summer Math Camps and After School Program*
	First Nations Education Steering Committee	0	0	33,000	0	0	*For Math Assessment Project*
	CNRS Contribution	0	631,250	779,246	875,000	875,000	*This represents salaries paid to visiting CNRS Researchers by their home institutions*
	Subtotal Revenue	2,793,350	4,120,319	3,169,327	3,394,860	3,246,610	
	Carryforward from Previous Year	1,558,052	1,077,283	861,212	200,000	408,000	*PIMS has worked to reduce carry-forward amounts over time*
	Total Revenue	$4,351,402	$5,197,602	$4,030,539	$3,194,860	$3,654,610	*ab. AAHT $400K was not included in total for FY1011*

Expenses		2007-2008 Reconciled Actual	2008-2009 Reconciled Actual	2009-2010 Reconciled Actual	2010-2011 Budgeted	2011-2012 Budgeted	Memo
Operations	*Salaries*						*Salaries peaked in FY0809, then falling revenues in FY0910 necessitated cuts - the Chief Operations Officer, Web Manager and Finance Officer positions all remain unfilled, the use of contract/temp staff and part-time work has been encouraged. Overhead costs and staff travel have been more tightly controlled. In FY1112, PIMS no longer needs to support BIRS, which has enabled the hiring of a Communications Manager*
	Sub-total	433,632	490,900	436,992	359,982	409,446	
	Office Expense						
	Sub-total	203,843	209,599	181,859	147,000	97,000	
	Travel and Meals						
	Sub-total	8,109	3,474	2,534	3,000	1,000	
	Total Operating Expenses	$645,584	$703,973	$621,385	$509,982	$507,446	
Industrial	*Salaries*						
	Sub-total	28,167	46,150	10,918	0	0	
	General Expense						
	Sub-total	375	0	0	0	0	
	Events						
	Sub-total	77,253	76,950	62,405	17,000	19,911	
	Total Industrial Expenses	$105,795	$123,100	$73,323	$17,000	$19,911	
IGTC	*Salaries*						*The IGTC in Math Biology is now a flourishing program with student fellowships and a Coordinator.*
	Sub-total	37,970	156,040	195,102	218,467	253,068	*The IGTC holds summits, summer schools and assists students with travel to seminars within the PIMS network*
	Events						
	Sub-total	11,214	14,001	26,659	41,300	31,000	
	Total IGTC Expenses	$49,184	$170,041	$221,761	$259,767	$284,068	
Scientific	*Salaries*						*PIMS reduced the number of PDFs in FY0910 & 1011 due to falling revenues. As funding has improved in FY1112, PIMS has been able to increase PDF*
	Sub-total	702,944	765,183	583,281	449,308	630,971	
	General Expense						
	Sub-total	168,339	49,742	63,506	49,334	49,333	
	Events						*Reductions in spending in this category are due to falling revenues and the elimination of the large carry-forward balance.*
	Sub-total	1,042,610	1,164,424	847,421	396,000	582,174	
	Total Scientific Expenses	$1,914,093	$1,979,349	$1,494,208	$894,642	$1,262,478	
Education	*Salaries*						
	Sub-total	59,258	166,174	105,454	107,400	69,100	
	General Expense						
	Sub-total	23,850	18,954	10,296	10,000	10,000	
	Events						*The figures for FY0809 & FY0910 include Summer Math Camps. More funding for Education projects was won for FY1112 (AAHT, PNESC & Year of*
	Sub-total	104,809	140,384	247,929	37,500	127,930	
	Total Education Expenses	$187,917	$325,512	$363,679	$154,900	$207,030	
Exec. Board	*General*						*The costs here have increased as PIMS has expanded. More PIMS Sites means more Site Directors, each of whom requires stipends.*
	Sub-total	144,825	137,738	200,992	190,700	199,500	
	Meetings						
	Sub-total	41,682	50,427	32,064	30,000	30,000	
	Total Exec/Board Expenses	$186,507	$188,165	$233,056	$220,700	$229,500	
External	**Total External Expenses**	$188,000	$846,280	$681,280	$948,800	$878,000	*The large jump here in FY0809 reflects the salaries of CNRS Researchers visiting PIMS.*
	Total Expenses	$3,274,120	$4,336,398	$3,669,262	$3,001,991	$3,389,435	
	Closing Balances at Year End	$1,077,283	$861,212	$361,277	$192,869	$265,177	*Please note that the Reserve of $130,000 is held within this carry-forward balance*

8. Please identify the university resources, if any, provided to your Centre.

Space: PIMS-SFU has an administrative office and computer labs/offices located in the TASC 2 building housing approximately 30 graduate students, 3-4 post doctoral fellows, and 1-2 visiting researchers from the Math, Computing Science, and Statistics departments. In addition, PIMS administers a seminar room located in TASC 2 (Room 8500) for graduate seminars, workshops, and small conferences. Specific rooms allocated to PIMS are rooms 8500-8518, accessed through room 8510 (the common area of the office which has a small kitchen and lounge area).

University Personnel: None

Major Equipment: None

Funding: SFU funds PIMS with support of $80,000 annually. This amount represents SFU's membership fee for being part of the PIMS consortium.

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

PIMS programs include Collaborative Research Groups (CRGs), workshops, summer schools, industrial problem solving workshops, PIMS-CNRS research visitors, postdoctoral fellows, seminars as well as numerous educational and outreach activities. As can be seen from the attached information, these require substantial funding and organizational assistance provided by PIMS that is not available to individual researchers, especially given the small grants prevalent in the mathematical/statistical sciences. These programs and events greatly enhance the educational and research environment for the mathematical sciences at SFU.

10. Provide a rationale for the continuation of your Centre.

PIMS provides opportunities for faculty and students in mathematics, statistics, computer science and other related fields at SFU. It is one of the top mathematics research institutes in North America and has been designated as an Unite Mixte Internationale of the French CNRS, which provides a prestigious status for all of our consortium members. Funding from NSERC through the MRS program is mid-way in a six-year cycle, a renewal proposal will be prepared in 2013. As we have expanded and improved our programs, they have received increased recognition, and we expect this trend to continue over the next five years. Renewal of our status as a Centre at SFU will ensure that the university fully benefits from all of our programs and leveraged funds.

11. List your Centre's goals for the next five years.

Our main goals will be to continue to engage the communities of mathematical scientists at SFU so that more faculty and students can benefit from our programs. We also would like to develop more interdisciplinary projects involving other natural sciences (for example on the theme of mathematics and sustainability), increase the flow of international visitors to SFU, provide stable funding for all the highly worthwhile educational/outreach programs which take place at PIMS-SFU, and more generally provide an enhanced platform for collaboration between SFU personnel and individuals from other universities and international organizations.

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

On July 1, 2011, Professor Nils Bruin will become the PIMS Site Director at Simon Fraser University. Under his leadership we will seek to accomplish the goals mentioned above.

13. Provide an updated calendar description if different from the old listing on the first page.

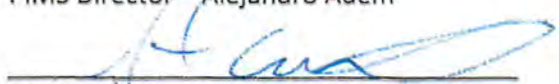
N/A

14. Outlook for the future and other comments, by the Director of the Centre:

Currently the mathematical and statistical communities are developing a Long Range Plan for NSERC, which will develop a stable funding mechanism for Discovery Grants in these disciplines, as well as the mathematical sciences institutes. As a member of the Steering Committee for this project I am involved in formulating a vision for the next 5-10 years, which will clearly outline, among other things, how institutions such as PIMS will fit into the Canadian scientific landscape. Given the evolving nature and scientific quality of our programs, as well as the grassroots nature of PIMS, I am convinced that we will continue to play a key role. The backing of the PIMS member universities is essential for our success, and I wish to take this opportunity to thank Simon Fraser University for their generous and steadfast support.

Signature of the Director of the Centre/Institute

PIMS Director – Alejandro Adem Date: 05.26.11



PIMS-SFU Site Director – Steve Ruuth Date: 06.06.11

6

Faculty Dean – Centres Only

a. Comment on the Centre's performance:

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

c. Recommendation:

Signature of the Faculty Dean or Vice-President, Research

_____ Date:_____

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:
PIMS is a highly successful inter-university institute.
SFU is a leading partner who has very actively participated.

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):
SFU's support for PIMS was negotiated several years ago, and will be continuing.

c. Recommendation for renewal:
Essential institute!
Renew.

Signature of the Vice-President, Research

Date: 11/21/2011

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **TRIUMF - Canada's national laboratory for particle and nuclear physics**

2. Director of the Centre

Name: Nigel S. Lockyer Phone Number: 604-222-7353

Expiry Date of Term as Director: April 30, 2012 Fax Number: 604-222-3791

Office Location: 4004 Wesbrook Mall, Vancouver V6T 2A3 Director's Email: lockyer@triumf.ca

Web Address of Centre: __ http://www.triumf.ca/_

Generic Centre Email: director@triumf.ca

3. Centre Description:

TRIUMF is a joint venture of the University of Alberta, the University of British Columbia, Carleton University, the University of Guelph, l'Université de Montréal, Simon Fraser University, the University of Manitoba, Queen's University, the University of Toronto, York University and the University of Victoria. TRIUMF is funded under a contribution agreement through the National Research Council of Canada. The TRIUMF facility is based on a 520MeV cyclotron capable of producing multiple proton beams simultaneously, each at a different energy level. TRIUMF has developed a world-class facility called ISAC, which produces beams of unstable rare isotopes. Scientific research at TRIUMF includes medium energy nuclear and particle physics, astrophysics, condensed matter studies, Nuclear Medicine and radiochemistry for the production of radiopharmaceuticals. Applied research includes the design of small cyclotrons, microchips, controls software and medical applications such as the use of proton beams and radioisotopes for cancer therapy.

4. Provide a detailed list of accomplishments of the Centre for the past five years.

Please find attached National Research Council (NRC) International Peer Review Committee Report (IPRC).

5. Has your Centre accomplished its goals?

Please refer to report noted under section 4. Approval for continued funding by the federal government for 2010 to 2015 is confirmation that goals were achieved.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

TRIUMF Joint Venture agreement attached along with Terms of Reference for the governing Board of management. Attached is a copy of the TRIUMF organization chart along with the current Board of Management membership list.

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources.** (Attached a separate document, if necessary.)

RESEARCH CENTRE/INSTITUE RENEWAL APPLICATION
Reporting Period: April 1, 2006 - March 31, 2011
Requirement #7: Summary of Financial Resources Attracted and Used

		Fiscal Years - In Thousands ($000)				
Funding/Income	Total	2010-11	2009-10	2008-09	2007-08	2006-7
National Research Council	229,500	45,000	44,000	43,500	51,500	45,500
Natural Sciences and Engineering Research Council	30,511	6,310	6,588	5,971	6,375	5,267
British Columbia Knowledge Development	632	632	---	---	---	---
Nordion Inc.	20,551	4,219	4,350	4,371	3,839	3,772
Advanced Applied Physics Solutions Inc.	3,956	1,755	1,167	1,034	---	---
Canada Foundation for Innovation	12,915	5,580	1,946	1,115	1,869	2,406
Natural Resources Canada	700	700	---	---	---	---
Western Economic Diversification	919	---	919	---	---	---
Affiliated Institutions	9,292	2,110	2,191	2,092	1,815	1,084
Commercial Revenues	9,695	2,629	2,338	1,560	1,712	1,456
General Fund	1,212	98	81	175	461	417
Extramural Funds	7,419	1,275	1,443	1,301	1,500	1,400
Total	327,402	70,308	65,003	61,589	69,170	61,332

2

8. Please identify the university resources, if any, provided to your Centre.

Space: None

University Personnel:

Two joint appointments

Major Equipment:

CFI - TIER 1 Centre grant
CFI – M20 Beam Line for Materials Research

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

As a national laboratory, TRIUMF plays an infrastructure role for subatomic research in Canada. Currently some 80 % of all NSERC approved funding relating to experimental subatomic research involves TRIUMF.

10. Provide a rationale for the continuation of your Centre.

SFU is heavily engaged in the TRIUMF program through its departments of Physics and Chemistry. SFU was awarded a major CFI award for the establishment of a Tier I computing centre at TRIUMF – one of ten in the world.

11. List your Centre's goals for the next five years.

Below is the Schedule of Work provided by the federal government through the NRC.

NRC CONTRIBUTION AGREEMENT 2010 - 2015

AGREEMENT OF WORK

TRIUMF PROJECT ACTIVITIES

1) In Particle Physics, TRIUMF will support the Canadian community in alignment with the subatomic-physics Long Range Plan. In particular, TRIUMF will support extracting and analyzing the physics from the T2K experiment in Japan, the ATLAS and ALPHA experiments at CERN, and the PIENU experiment at TRIUMF.

2) In Nuclear Physics, TRIUMF will support the Canadian and international community in alignment with the subatomic-physics Long Range Plan. In particular, TRIUMF will develop rare-isotope beams from actinide targets required for the ISAC experimental program. TRIUMF will complete the installation and commissioning of EMMA and IRIS by 2013.

3) In Nuclear Medicine, TRIUMF will support the development of Canadian leadership in nuclear medicine and molecular imaging. In particular, TRIUMF will complete development of the localized Good Manufacturing Practice laboratory. TRIUMF will produce medical isotopes for the Pacific Parkinson's Program and will develop and deliver medical isotopes for research with the British Columbia Cancer Agency.

4) In Materials and Molecular Science, TRIUMF will support the scientific community and, in particular, will complete the construction and commissioning of the M-9A and M-20 muon beam lines in 2012.

5) For the Advanced Rare IsotopE Laboratory supported by multiple agencies and partners, TRIUMF will meet the following milestones:
    a. Fabrication and assembly of the first Injector Cryomodule and a 30 kW beam test will be completed by March 31, 2012.
    b. Civil construction of the ARIEL facility will be nominally complete by March 31, 2013.
    c. Installed in the Proton Hall, the e-linac will deliver low-current beams at 25 MeV by March 31, 2014.
    d. Electron beams at 25 MeV, 100 kW will be delivered by March 31, 2015.

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12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

None planned

13. Provide an updated calendar description if different from the old listing on the first page.

1. Name of the Centre: **TRIUMF - Canada's national laboratory for particle and nuclear physics**

2. Director of the Centre

Name: Nigel S. Lockyer Phone Number: 604-222-7353

Expiry Date of Term as Director: April 30, 2012 Fax Number: 604-222-3791

Office Location: 4004 Wesbrook Mall, Vancouver V6T 2A3 Director's Email: lockyer@triumf.ca

Web Address of Centre: __ http://www.triumf.ca/_

Generic Centre Email: director@triumf.ca

14. Outlook for the future and other comments, by the Director of the Centre:

Quoted from TRIUMF's web site – January 2011

"There is a new level of buzz and activity at TRIUMF. You can sense the anticipation in the air. Everywhere, things are moving and stuff is appearing around the site—boxes, shipping crates, metal pipes, cables magnets, vacuum pumps. No longer are we the "tidy" laboratory, at least not for the next few years. People are busy, very busy. Busy with science. Busy with projects.

The Government of Canada and the Province of British Columbia have funded several projects that will expand the laboratory in a number of new directions. The biggest and most significant project is ARIEL (Advanced Rare IsotopE Laboratory). ARIEL is focused on building a new powerful electron accelerator using superconducting radio frequency technology (SRF). Significant associated infrastructure across the site is needed: a new two-storey "Stores" building, a cryogenic shed to house the expansions needed for liquid helium usage, and the ARIEL facility itself. The primary purpose of ARIEL is to produce "isotopes for science and medicine."

When Phase I is complete in 2014, TRIUMF will be a unique facility in the world: capable of producing rare isotopes with beams of both electron and protons and operating a post-accelerator complex with unparalleled capabilities. Together these will drive a suite of state-of-the-art experiments to investigate the origins of the chemical elements, understand how stars explode, and probe fundamental properties of a range of rare nuclei.

A new expanded physics program will be in place for studying fundamental symmetries of nature when ARIEL Phase II is complete (beyond 2015). The search for time-reversal symmetry violation will be a major portion of the program. Experiments that measure the electric-dipole moment of the atom and electron are planned. This will be complemented by a new program to measure the electric dipole moment of the neutron, scheduled to begin in 2015.

Safety and Quality Assurance continue to be high priorities at TRIUMF. The safety of our workers and environment is the highest priority of TRIUMF and together with new project-management techniques, we are able to maximize the potential for scientific discoveries with the resources available and at the same time build for the future.

Over the next few years, I see the following:

Science:

- *Up to the time when ARIEL is fully commissioned, TRIUMF's rare-isotope science program will focus on the new neutron-rich isotopes being produced by the low-power actinide-target program along with detailed studies of halo nuclei using high power targets.*
- *TRIUMF particle physicists are being inundated with excellent data. This is good. Data means new physics results. CERN's Large Hadron Collider experiment ATLAS, an experimental program centered at TRIUMF with the large pan-Canadian involvement, is off and running. First results are already significant. Much more is on the way. The T2K experiment in Japan, of which TRIUMF and Canada are major participants, has also begun to accumulate data from their unique off-axis experiment.*
- *The Nuclear Medicine program has several new projects, the most important being demonstrating the production of Tc-99m using cyclotrons with partners at the BC Cancer Agency, Lawson Health Research Institute in London, and the Centre for Probe Development and Commercialization (CPDC) at McMaster University. The Centre for Molecular and Materials Science (CMMS) program is commissioning two new beam lines for muon spin resonance and developing a new spectrometer. A helium recovery system is being designed. This research focuses on the study of magnetic phenomena such as high temperature superconducting materials. In accelerators, TRIUMF's team will be busy designing, building, and installing ARIEL of course. In addition, however, we'll be upgrading cyclotron systems, and expanding our basic research and student-training programs in accelerator physics.*

Commercialization:

- *TRIUMF's technology-development partner Advanced Applied Physics Solutions (AAPS) is embarking on several new programs with industrial partners. The new CEO, Jack Scott, is developing a network with TRIUMF member universities to further enhance commercialization opportunities.*
- *TRIUMF scientists have begun new nuclear-medicine research collaborations with Nordion and General Electric Healthcare, and TRIUMF has recently signed a new agreement with Advanced Cyclotron Systems (ACSI) to work together on advancing cyclotrons for the production of medical isotopes.*

Universities and International Partnerships:

- *The University of Northern British Columbia has joined TRIUMF as an associate member. Two additional university requests for membership are being discussed at the Board of Management level.*
- *International agreements and partnerships in science are essential for TRIUMF to maintain its status as a world leader. Working with the best laboratories and researchers around the world is a priority for TRIUMF and Canada. The most recent and largest is the Ultra Cold Neutron Project (UCN) led by the University of Winnipeg, Osaka University Laboratory RCNP, and KEK in Japan. Japan is investing significantly in this project, which is due to receive first beam in 2015.*

In summary, these are exciting times. TRIUMF has a great opportunity to shine on the scientific world stage as we continue to ratchet up our commitment to ***Accelerating Science for Canada.***

Sincerely,

Nigel S. Lockyer
Director of TRIUMF"

Signature of the Director of the Centre/Institute

Director

Date: July 19, 2011

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Faculty Dean – Centres Only

a. Comment on the Centre's performance:

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

c. Recommendation:

Signature of the Faculty Dean or Vice-President, Research

_____ Date:_____

Vice-President Research - Institutes Only

a. Comment on the Centre's performance:
An unqualified success-story. TRIUMF has made a major leap forward in the past 5 years, and is a timely international laboratory for subatomic physics

b. Comment on future University support for the Centre (financial, teaching release, space, etc.):
The various contributions by SFU (secondments, joint appointments, CFI support etc.) will continue.

c. Recommendation for renewal:
We are a major partner in TRIUMF, leading in several areas. Renewal is essential!
RENEW!

Signature of the Vice-President, Research

Date: 11/21/11

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Attachment I

NRC International Peer Review Report

NRC·CNRC
From Discovery to Innovation...

Science at work for Canada

Final Report

Report of the Peer Review Committee on TRIUMF

4 NOVEMBER 2008

National Research Council Canada
Conseil national de recherches Canada

Canada

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report presents the findings and recommendations of the 2008 TRIUMF Peer Review Committee on the Laboratory's Five-Year Plan, for the period 2010-2015, submitted to the National Research Council of Canada for funding. The Committee membership represented a broad set of disciplines and included experts in the fields of experimental and theoretical particle physics, experimental and theoretical nuclear physics, accelerators, biology, nuclear medicine, condensed matter physics, radiation oncology, and commercialization. The Committee, notwithstanding its diverse expertise and experience, rapidly came to a fully supportive consensus on all the key elements of TRIUMF's Five-Year Plan.

The Plan – concentrating on TRIUMF's core competencies of radioactive beams, support for particle physics experiments, and nuclear medicine – is science driven while at the same time opening opportunities for societal benefit. The underlying basis is formed by the accelerator and detector infrastructure, existing and planned, linking together all scientific areas targeted by the laboratory. These strong interconnections are a unique strength of TRIUMF. The Plan reinforces these linkages and although covering the next five years in detail, it goes far beyond this time scale: it presents a strategic vision for the future of the laboratory, a vision in which Canada should invest. The Plan is also transformational: it builds on the strengths of the present research but opens the path to new world-class initiatives. The two key drivers are the proposed superconducting Electron Linear Accelerator (e-linac) and the expansion of nuclear medicine, both enormous steps forward in several aspects.

The Plan builds on the strong interconnections between accelerators, detectors, and the individual science topics, all addressing fundamental questions in their respective fields. Its coherence and its transformational nature strongly reflect the dynamic leadership of the new laboratory Director and his team. It also builds on the expertise of TRIUMF personnel, including the team of young and skilled people attracted by the exciting prospects the laboratory has begun to offer and which are greatly enhanced in the Five-Year Plan.

The Plan presents an exceptional opportunity for the Canadian scientific and business communities to seize world leadership in the two main thrusts of the proposal. It is fully aligned with Canada's Science and Technology Strategy and strengthens all three advantages: entrepreneurial advantage, knowledge advantage, people advantage.

Recommendation: Consequently, the Review Committee wholeheartedly and unanimously endorses the proposed Plan in its totality. Failure to support either the scientific thrust or the level of funding, as proposed in the Plan, would jeopardize this opportunity irreversibly.

Supporting this recommendation are the following key elements:

Key element #1 – Accelerators
The e-linac would be a transformational addition to the accelerator complex that enhances the capabilities and broadens the scope of every science endeavour at TRIUMF.

The addition of a second proton beam line will both accelerate radioactive beam capability development which has been a limiting factor in expansion of the scientific program at ISAC I and ISAC II and allow experiments to run simultaneously, thereby increasing overall productivity.

TRIUMF's current accelerator expertise and ambition allows exceptional new partnering opportunities both with frontier international accelerator laboratories and Canadian industry. The accelerator components in the proposed Plan would significantly enhance those opportunities.

Key element #2 – Nuclear Physics
The second proton beam line and the new target station are key elements to ensure TRIUMF continues to be recognized as having a world-leading program in nuclear structure and astrophysics on neutron-deficient nuclei.

The e-linac will be transformational in opening a world-leading research program on neutron rich nuclei.

Both will raise TRIUMF further in the premier league of laboratories for nuclear astrophysics worldwide.

Key element #3 – Life Science and Nuclear Medicine
There is, at this time, a unique opportunity for Canada to drive forward personalized and optimized medicine and health care through the integration of nuclear medicine and the life sciences manifest in the proposal.

TRIUMF and its partners (academic and business) are ideally placed to make major inroads into both the early identification of disease and the measurement of the efficacy of drug-based interventions. This will place Canada at the forefront of these fields.

To capture the transformational role in nuclear medicine and health-care requires the e-linac, the second proton beam line, and TRIUMF's expertise in imaging detector technology.

Key element #4 – Particle Physics
Particle physics in Canada is addressing key scientific questions through participation in world-leading programs: ATLAS at CERN, T2K in Japan, and the SNOLAB facility in Canada.

The ATLAS Tier 1 Centre and the T2K analysis centre are key for enabling this vigorous program.

The capabilities of TRIUMF in detector technologies and infrastructure remain crucial for Canada's continued participation in world-class particle physics research.

Key element #5 – Molecular and Materials Science
TRIUMF represents one of a handful of facilities in the world, and the only North American facility, able to use muons to probe local electromagnetic fields in any condensed matter system, providing experimental data of relevance to magnetic materials and superconductors as well as other materials where properties on the molecular and nanoscale are crucial.

Leveraging the investments in upgraded beamlines (M9A and M20) made by TRIUMF and CFI is a key element of the Plan.

Key element #6 – Commercialization and Economic Impact
TRIUMF has an enviable and successful history of commercialization. The recent CECR award to establish AAPS Inc. puts it on track to double its economic impact over the next five years. The newly acquired core competencies broaden the opportunities for technology transfer particularly in the area of superconducting RF technology where commercialization opportunities are manifest in cryogenics, RF cavities and their associated instrumentation.

Key element #7 – Training and Outreach
TRIUMF has had a substantial and high quality educational program commensurate with the scale and scope of its activities. The new initiatives will enrich all aspects of TRIUMF's education and training program.

Key element #8 – Management
TRIUMF is led by a very talented and capable management team which is fully qualified to successfully implement the Five-Year Plan in its entirety.

The Committee observed with satisfaction the enthusiasm and commitment noticeable at all levels of staff at TRIUMF, from the Director and his team, to students and technicians. There is an excellent spirit in the laboratory illustrating the excitement in the community for the program which was developed strategically as well as in conjunction with stakeholders.

Key element #9 – Coherence
The deep interconnections between TRIUMF's individual science topics and its expertise in accelerators and detectors provide synergies which enhance both fundamental aspects of the laboratory's mission: knowledge creation and economic impact.

Key element #10 – Transformational Nature of the Plan
The Plan opens the path to new world-class initiatives that will be of great benefit for science, education, and the economy of Canada. The two key drivers are the proposed superconducting Electron Linear Accelerator (e-linac) and the expansion of the nuclear medicine program.

1. INTRODUCTION

TRIUMF is one of the leading subatomic physics laboratories in the world. Particle and Nuclear (Astro)-Physics, Life Sciences and Nuclear Medicine, Molecular and Materials Science, Accelerator Science, Detector Development and Construction form the basis for the scientific program. Bridging the academic and commercial sectors, training of highly qualified personnel (HQP) and communication are significant additions.

TRIUMF is currently managed as a Joint Venture of seven Universities, continuing its evolution from the original three members. This is two more compared to only five years ago. Seven additional universities are associate members. Very recently, Queen's University has applied for full membership, underlining the recognition of TRIUMF as the national laboratory in these fields for the Canadian academic sector.

TRIUMF is operated under a contribution from the Government of Canada through the National Research Council of Canada (NRC). The province of British Columbia provides building funds, an important aspect for the realization of the Plan. A Peer Review Committee was set up by NRC to evaluate and comment on the Five-Year Plan put forward by TRIUMF. Membership and Terms of Reference are presented as Appendices A and B, respectively. The Peer Review Committee met at TRIUMF in Vancouver from September 24 to 26, 2008, to evaluate the quality and impact of TRIUMF's programs carried out over the last few years and to provide insight and recommendations to NRC on the new Five-Year Plan proposed. The program of the site visit is presented in Appendix C. Prior to the visit the Committee had received all documentation in time for serious preparation and review. The site visit itself was very professionally organized, the talks were all high class and discussions to the point. The visit included talks and a poster session by students testifying to their enthusiasm and motivation to do research at the laboratory.

The Committee noted the consequences of the lower-than-requested budget allocation for the present Five-Year Plan. It limited the world-leading achievements TRIUMF anticipated in the previous proposed Plan. It should be noted, however, that in all areas where the requested funding was made available, TRIUMF was able to provide the promised deliverables.

The Committee was informed that the Province of British Columbia has in the past provided funding for buildings at TRIUMF. The Committee noted that the current Plan calls for new buildings as an important ingredient for the realization of the Plan without which the scientific vision cannot be transformed into reality.

The Committee noted with satisfaction that the Plan was derived in an open and transparent consultation process providing multiple opportunities for review and comment by TRIUMF staff, the Canadian science community, and various committees. The recommendation of the Advisory Committee on TRIUMF (ACOT) which "enthusiastically endorses the Five-Year Plan and recommends that it be fully implemented" speaks for itself.

2. ACCELERATORS

Key elements

The e-linac would be a transformational addition to the accelerator complex that enhances the capabilities and broadens the scope of every science endeavour at TRIUMF.

The addition of a second proton beam line will both accelerate radioactive beam capability development which has been a limiting factor in expansion of the scientific program at ISAC I and ISAC II and allow experiments to run simultaneously thereby increasing overall productivity.

TRIUMF's current accelerator expertise and ambition allows exceptional new partnering opportunities both with frontier international accelerator laboratories and Canadian industry. The accelerator components in the proposed Plan would significantly enhance those opportunities.

2.1 Introduction

Accelerators underpin every facet of TRIUMF's multidisciplinary program. It is the accelerators that make possible the realization of the outstanding scientific agenda that comprises the impressive knowledge advancement elements anticipated in the Five-Year Plan. Accelerator technology at TRIUMF, which derives its pre-eminence from a suite of outstanding on-site research and commercial facilities and from the excellence of its professional staff, is the core competency that drives all four of the Laboratory's scientific business lines. This core competency also enables international partnerships allowing TRIUMF to make key contributions to world-leading accelerator facilities. The LHC at CERN in Europe and J-PARC in Japan are recent examples where TRIUMF has successfully delivered operation-ready accelerator systems of high complexity and excellent quality. Part of TRIUMF's commercialization success also comes from this area.

2.2 Recent Contributions to World-leading Accelerator Facilities

For the LHC accelerator complex, TRIUMF built kicker magnet pulse forming networks and most of the magnets and power supplies for the upgraded 1.4 GeV transfer line. These have been installed and successfully commissioned at CERN.

The TRIUMF contribution to the J-PARC accelerator is mainly in the beamline upstream of the target station. It includes a) design and simulation of the beam line optics and b) construction of beam monitors in a radioactive vacuum environment. Given TRIUMF's expertise, the design work was successfully done. Also, novel technologies were implemented in the beam monitor system, including a remote handling system. These components have been shipped to J-PARC and will soon be installed for commissioning. These contributions are critically important for the success of the T2K neutrino experiment.

2.3 Superconducting RF: A New Core Competency for TRIUMF

In a remarkably short time, TRIUMF has established a highly successful program in the challenging area of superconducting (SC) RF technology. Their mastery of this challenging technology is evidenced by the 20 MV accelerating section (the SC-linac) that transports the beam to ISAC II. The SC-linac comprises a super conducting quadrupole magnet for transverse focusing of the beam and 5 cryogenic modules, each with 4 superconducting cavities. The SC-linac met its performance goals in its first commissioning run and began operating for science in 2006. During the past year, it has achieved a very impressive uptime efficiency of 98%. The SC development places TRIUMF at the forefront of SC technology: TRIUMF now has a very capable staff with broad experience in all facets of the design, construction and operation of SC linacs.

TRIUMF has transferred its expertise in superconducting technology to the Richmond, B.C. - based PAVAC Industries Inc., a world-leading company in hybrid beam technology. PAVAC has successfully manufactured RF cavities and ancillary equipment which establishes them as one of only a handful of companies world-wide competing in this rapidly expanding market.

2.4 The e-linac: A Transformational Addition to the Accelerator Complex

The SC core competency enables TRIUMF to propose with confidence a transformational addition to their accelerator infrastructure – the e-linac. This superconducting photo-fission driver enhances the capabilities and broadens the scope of every science endeavour at TRIUMF:

- doubles the Radioactive Ion Beam (RIB) hours per year
- provides access to currently inaccessible neutron rich nuclei
- enhances the βNMR program
- allows for a much cleaner production of actinides
- is the springboard for yet-more innovative participation in worldwide accelerator R&D partnerships and leadership roles in upgrades of foreign facilities
- facilitates new opportunities for commercialization

As is explained below in the section on targets, the e-linac permits target development concurrently with operations for science. Yet another benefit is the ability to operate the e-linac during the annual 3-month maintenance shutdown of the cyclotron, thereby increasing the operational hours by about one third.

2.5 Target Development

The success of radioactive beam facilities worldwide is determined in large measure by their ability to produce beams of interest to their users. While most of the capital investment at ISOL facilities is in the accelerators (ISOL driver and post accelerator) and experimental equipment, the beam capability is ultimately determined by the ability to provide suitable target materials that must operate in a very hostile environment and extract from those targets the ions of interest. The ability to deliver a new beam is dependent on a beam development program that is time-consuming, iterative, and inherently unpredictable. At present this beam development activity must compete with science production beam delivery at TRIUMF. The previous Five-Year Plan request included a second target, which would have been used for beam development, however this was not funded. The consequences of

this shortfall have manifested themselves in the difficulty in meeting user demands for beams. This has not prevented TRIUMF from bringing into operation a wide variety of novel experiments but it has proven a scheduling bottleneck for some areas of importance. The recent availability of the laser ion source and the FEBIAD ion source are welcome developments as is the recent successful test of the actinide target. Proceeding to a licensed production actinide target is essential to provide beams on the neutron rich side of stability and crucial for experimental programs such as TIGRESS. The e-linac will provide a cleaner implementation of the actinide target – operable at higher power although it will not replace the need for a proton driven actinide target.

Beam development has received about 30% of the ISAC operating time. To manage user expectations, Year 1 priority in the new scheduling protocol of the Five-Year Plan will comprise science production beam delivery, whilst Year 2 priorities will be directed to beam development activities. The ultimate solution is the second target, proposed as part of the Five-Year Plan and sharing common infrastructure with the e-linac, which will both increase scientific production time and alleviate the beam development bottleneck.

2.6 Refurbishments of the Cyclotron

Although the cyclotron is a relatively mature machine, it continues to operate very well. It is capable of supporting the additional stored current to illuminate two targets simultaneously. The Five-Year Plan includes sufficient funds for the required maintenance and refurbishment which should enable high efficiency operation for at least the next 10 years. The Committee is confident that the cyclotron will provide robust and flexible operation well beyond 2015.

3. NUCLEAR PHYSICS

Key elements

The second proton beam line and the new target station are key elements to ensure TRIUMF continues to be recognized as having a world-leading program in nuclear structure and astrophysics on neutron-deficient nuclei.

The e-linac will be transformational in opening a world-leading research program on neutron rich nuclei.

Both will raise TRIUMF further in the premier league of laboratories for nuclear astrophysics worldwide.

3.1 Introduction

Over the past decade, the Canadian government has funded the development of a state-of-the-art facility in Radioactive Ion Beam (RIB) research: ISAC at TRIUMF. The ISAC facility is now poised to become one of the premier research centres in RIB science. It has attracted a large number of outstanding young scientists, many from outside the country, to faculty positions in Canadian universities and staff positions at TRIUMF. They, in turn, have been very successful in obtaining grant funding to develop instrumentation at ISAC. This influx of talent has completely changed the character of nuclear physics research in Canada. The program set forth in the new Five-Year Plan amplifies these developments. The addition of the e-linac, the proton beam line and new target stations, and the improvements in the cyclotron will combine to provide the facility with the RIBs that will make it among the world leaders in this field. Over the next five years, the ISAC program can make the move to preeminence with the corresponding knowledge and technology creation, HQP training and potential commercialization opportunities. Continuing the program at its present level will result in a loss in scientific productivity and eventually a loss of many of the university-based scientists who will move their research programs elsewhere. Investing in the Plan will not only maintain the strong base of Canadian scientists working at ISAC, but it will significantly enhance the number of highly-skilled scientists who will come from outside of the country to carry out their research at the facility. This, in turn, will create new knowledge that can lead to the development of new technologies.

Around the world, major new facilities are being constructed to investigate the science made possible with RIBs. Investments in new facilities already underway for this field in Europe and Asia will soon exceed $2 billion; with planned investments in the USA and elsewhere the number will soon be more than $3 billion. Canada is in a unique and enviable position through TRIUMF's expertise and recognition: with modest funding, it can have one of the best facilities in the world for RIB science. Already it is recognized as a major facility in this field having achieved the highest beam intensities available for several exotic nuclei. The science that has come from studies with these beams has had a substantial impact on our understanding of nuclei near the edge of existence. Fully funding the Plan will result in a huge increase in the capabilities of the laboratory keeping TRIUMF for many years at the forefront.

3.2 Nuclear Astrophysics: Studying Stellar Explosions in the Laboratory

Nuclear astrophysics aims at understanding the origin of the elements in the Universe and the many astrophysical objects which produce them. It is a truly interdisciplinary field combining experimental and theoretical nuclear physics with astrophysical modeling and observations. Building on the high-intensity, high-quality RIBs from the ISAC facility and its impressive suite of world-class detectors, TRIUMF has grown during the last decade into the world leading laboratory to determine low-energy cross sections for particle reactions on neutron-deficient nuclei -- reactions that are essential to understand the dynamics and associated nucleosynthesis of explosive astrophysical events, such as novae or x-ray bursts.

Despite the recent successes, it is the developments outlined in the new proposal that will allow TRIUMF to exploit the full range of measurements needed in nuclear astrophysics. While building on their core competence, the additional proton beam line will allow for significantly more time for critical beam development and it will allow for a larger number of experiments to be staged resulting in the ability to determine more crucial cross sections for nova and x-ray burst simulations.

The e-linac will open a completely new door for nuclear astrophysics produced by photofission on actinide targets, including many of the short-lived neutron-rich nuclei which play an essential role in the astrophysical r-process. This process produces about half of the elements heavier than iron in the Universe, but its astrophysical site and dynamics are still largely unknown. Indeed understanding the r-process has been identified as one of the forefront open questions in science. While there are large efforts underway in Japan, Europe and the United States to construct RIB facilities aimed at the production of r-process nuclei and the determination of their properties, timely construction of the e-linac will give TRIUMF a competitive edge in this forefront research which enjoys high public visibility.

The experimental nuclear astrophysics program is supplemented and accompanied by a strong theoretical program covering a wide range of astrophysically relevant topics. These efforts will additionally benefit from the hiring of a new theorist with interest in modeling astrophysical events and nucleosynthesis processes.

The Committee was particularly impressed by the many young people involved in the experimental and theoretical nuclear astrophysics program, clearly underlining the scientific appeal of this research field. The Committee also notes the timeliness of the program, matching well with worldwide initiatives in earth- and space-bound astronomical observation.

3.3 Nuclear Structure and Reactions

Our understanding of how nuclei are built from their basic constituents, the protons and neutrons, which are held together by the strong force, is currently experiencing an exciting renaissance.

This comes about as RIB facilities are beginning to explore nuclear properties for exotic short-lived nuclei with large neutron excess or deficiency. This progress is accompanied and supplemented by decisive advances in understanding the fundamental interaction among nucleons and in developing techniques and models to deal with the solution of the complex many-body problem.

TRIUMF with its ISAC facility and suite of world-class detectors has made several important contributions to this scientific endeavour and, if the current proposal is funded as presented, is poised to play a leading role in the nuclear physics renaissance. The addition of the e-linac and the production of nuclei from actinide targets will allow the facility to create the beams needed for the studies of nuclear properties in the yet unexplored *terra incognita* of short-lived exotic nuclei. This program is additionally enhanced with the completion of the ISAC II accelerator and the EMMA spectrometer in 2009.

The program will also have tremendous benefits for nuclear theory constraining and guiding the developments of improved models. Here the experimental program matches extremely well with the efforts of the TRIUMF theory group, which recently has played a world-leading role in deriving nuclear interactions from first principles using ideas from modern many-body theory. Much of this work is driven by young enthusiastic faculty and staff members, thus ensuring a strong program well into the future.

The introduction of TITAN, an apparatus for making precision measurements of nuclear masses, adds a new dimension to the ISAC program. Mass measurements play a key role in all three ISAC focus areas, nuclear structure and astrophysics as well as for the fundamental symmetry program.

3.4 Fundamental Symmetries

For decades, subatomic physicists have carried out a wide array of experiments to test the predictions of the Standard Model (SM) of particle physics and to look for potential physics beyond this model. Low energy, highest precision tests of the SM have been important elements in the program at TRIUMF for many years. There is now a major program of fundamental symmetry measurements at ISAC. Over the past few years, new approaches at ISAC have led to better constraints on the SM. Beta decay experiments, including those of nuclei that were collected in an ion trap, have set tight limits on interactions that are not allowed by the SM. These experiments, along with those at the very highest energies soon to be available at the CERN LHC, serve to constrain theoretical extensions to the SM.

The ISAC facility will continue to have a very active program in the field of fundamental symmetries into the future. In addition to experiments similar to those already underway, a totally new program can be launched in the future with the addition of heavy RIBs produced by proton spallation on an actinide target. The new experiments will search for a permanent nuclear electric dipole moment (EDM) in a nucleus. Finding such an electric dipole moment will have profound consequences and it could hold the key to understanding the matter-antimatter asymmetry in the Universe.

The experiments being planned to search for an EDM will require the upgrades in the new Five-Year Plan. Measurements carried out continuously for many months will be needed to obtain the sensitivity that could yield a non-zero measurement of an EDM. This will only become feasible once the ISAC facility has the capability to provide multiple beams to different experimental areas. The time scale for this option being put in place, around 2016, fits well with the time needed to complete the development of the experimental apparatus for the EDM search.

4. LIFE SCIENCES AND NUCLEAR MEDICINE

Key elements

There is, at this time, a unique opportunity for Canada to drive forward personalized and optimized medicine and health care through the integration of nuclear medicine and the life sciences manifest in the proposal.

TRIUMF and its partners (academic and business) are ideally placed to make major inroads into both the early identification of disease and the measurement of the efficacy of drug-based interventions. This will place Canada at the forefront of these fields.

To capture the transformational role in nuclear medicine and health-care requires the e-linac and the second proton beam line and TRIUMF's expertise in imaging detector technology.

4.1 The Approaching Medical Imaging Revolution

Medicine is undergoing a rapid paradigm shift as a result of the introduction of molecular medicine which provides a functional view of processes underlying health and wellbeing. This is a global direction underlying the move to personalized and optimized population health. Fundamental to this transformation is the application of nuclear physics to medicine to address predisposition, prognosis and response to interventions. Canada is very well placed not only to exploit this transformation, but to provide global leadership in implementation through harnessing the capacity of TRIUMF based nuclear sciences within the health system along with its partners, currently including the universities, Canada's Michael Smith Genome Sciences Centre and the BC Cancer Agency. This vision accords with the strategic Five-Year Plan of TRIUMF management. This proposal can deliver the promises of that strategic initiative. Part of this strategy is the explicit creation of a division of life sciences and nuclear medicine.

To assume significant global leadership and deliver this Plan requires the ability to create and apply novel and diverse radio isotopes within a receptive and aligned clinical and scientific environment focused on resolving health challenges.

The Committee wishes to stress that delivery of these benefits requires world-class science in three areas. The nuclear and accelerator science necessary to deliver the required isotopes in appropriate quantities to the chemists is a prerequisite. It also requires nuclear chemistry and biological insight to identify and deliver the appropriate radiotracers for PET scanners. Finally it necessitates a clinical environment willing to engage with this process. The Committee was impressed as to how all three conditions were met through TRIUMF and its university and clinical partnerships.

4.2 The Partnerships

It is clear from the Five-Year Plan, and from the presentations that the Committee was given, that successful and productive partnerships already exist with clinical scientists working in two areas. The first is Parkinson's disease and more generally Neurodegenerative disease. The second is in the arena of cancer treatment. These interactions happen through the

organizations of the British Columbia Cancer Agency and the Pacific Parkinson's Research Centre amongst others.

The PET technique relies on short lived isotopes so that, by necessity, actual chemical experimentation and clinical use rely on the partners being local.

A further piece of this jigsaw is provided by the presence on the TRIUMF site of MDS Nordion, a major Canadian industrial partner already heavily engaged in this science at a successful commercial level. It was clear from the MDS Nordion presentation that they wish this partnership to grow.

4.3 The Necessary Steps

For delivery of the ambitious ideas in Life Science and Nuclear Medicine described in the Five-Year Plan, it is clear that the following three investments are necessary. Firstly, the investment in the e-linac, new proton beams and target development are all absolutely required. This part of the program must obtain reliable access to the isotope production. Secondly, the new building is required to provide globally competitive state-of-the-art chemical processing capability to the program. Finally, delivery depends on the continuing, indeed growing, collaboration with the local university and health care systems.

Indeed, if this program is under-funded, this global leadership opportunity will slip away for TRIUMF and its Canadian partners and collaborators.

The implementation of the Five-Year Plan will guarantee the development of a world-class nuclear medicine program that will deliver outstanding medical, economic and societal outcomes/benefits.

5. PARTICLE PHYSICS

Key elements

Particle physics in Canada is addressing key scientific questions through participation in world-leading programs: ATLAS at CERN, T2K in Japan and the SNOLAB facility in Canada.

The ATLAS Tier 1 Centre and the T2K analysis centre are key for enabling this vigorous program.

The capabilities of TRIUMF in detector technologies and infrastructure remain crucial for Canada's continued participation in world-class particle physics research.

5.1 Introduction

TRIUMF scientists pursue a vigorous program of particle physics research, including experiments sited at the laboratory, and participation in off-site efforts. In addition, the technical resources of the laboratory – the capability to design, build and commission detectors and their associated electronics and data-acquisition systems – are used by the university-based Canadian sub-atomics physics community in support of a broad experimental program, in Canada and abroad. A bolstered and reinvigorated theory group at TRIUMF works closely with the experimentalists to hone the scientific questions and the interpretation of results.

The three main initiatives in off-site particle physics are: the ATLAS experiment investigating 14 TeV proton-proton collisions at the LHC at CERN; the T2K experiment studying long-baseline neutrino physics in Japan; and support of the SNOLAB facility, developing a deep, clean, underground facility for neutrino studies and rare event searches in Sudbury, Ontario.

Each of these is 'best-in-class'; they are, quite simply, the world leaders in their respective areas. At the same time, these areas are addressing questions that are widely considered to be among the most important in all of sub-atomic physics. Thus TRIUMF's particle physics program is world-class, focused, and relevant.

Over the course of the next few years, each of these experiments will move from a long period of construction into routine scientific operation. TRIUMF staff have already successfully provided their expertise to many international projects, for example, acting as the lead for the LHC Kicker Magnet project at CERN, the lead for the Hadronic Endcap project at CERN, and originator of the T2K project off-axis design in Japan. The Five-Year Plan envisages support – which this committee vigorously supports – that will thus allow Canadian scientists in these projects to reap the benefits of past investments, and to be well positioned to participate fully in the exciting scientific discoveries that are anticipated.

5.2 ATLAS: Working at the Energy Frontier

The ATLAS experiment will study proton-proton collisions at an energy of 14 TeV at the LHC, the world's highest energy accelerator. The experiment will shed light on the Higgs mechanism that gives rise to mass, but may also lead to revolutionary discoveries such as the discovery of new dimensions, the source of dark matter, or new families of particles.

A strong Canadian group (approximately 150 scientists) participates in the 2200-member ATLAS collaboration. Over the course of the previous Five-Year Plan, TRIUMF scientists have participated in the development of the LHC accelerator complex (see below), as well as the Canadian components of the detector. Construction is now complete, first beam has circulated in the LHC, and the collaboration is poised for first data.

Two key elements of ATLAS-Canada's ability to handle the enormous data rate from ATLAS and extract physics in a timely way are the Tier-1 data centre and a physics analysis centre. The Tier-1 data centre was funded by the Canada Foundation for Innovation (CFI) but requires on-going support; the physics analysis centre is a new proposal. Both are included in the Five-Year Plan, and in the view of the committee are essential to leverage Canada's ATLAS investment and scientific leadership for maximum scientific output.

Given the long time-scales involved, research and development for ATLAS and LHC upgrades must proceed over the first part of the Five-Year Plan. Canadian groups are involved in several different areas; TRIUMF technical expertise and infrastructure will be critical to their success.

5.3 T2K: Exploring the Neutrino Puzzle

T2K is an accelerator-based neutrino experiment at J-PARC in Japan. The primary goal of the experiment is to measure $\nu_\mu \rightarrow \nu_e$ neutrino oscillations and to measure the mixing angle θ_{13}. If this angle turns out to be large, the T2K group further plans to measure CP (charge parity inversion) violation in the neutrino sector by upgrading the accelerator power to a level of a few MW (from 750 kW). Data acquisition will start in 2009.

The T2K collaboration consists of 400 scientists, of whom 80% are from outside Japan. The Canadian group is one of the largest of the non-Japanese in terms of both manpower and financial contributions. The Canadian team is thus visible and significant in T2K, and Canadians occupy critical positions within the collaboration management.

Canada has contributed the first detector which is situated 280 m downstream of the neutrino production point (ND280). This detector is used to measure properties of the initial state of neutrinos immediately after the production target. The Canadian team constructed tracking detectors, including Time Projection Chambers and Fine Grain Detectors. These tracking detectors have been fabricated at TRIUMF utilizing resources such as machining, gas handling, clean room, electronics, data acquisition, etc. These contributions are the crucial elements in the T2K detectors, because the distant target detector, Superkamiokande, is already installed and working.

In the 2010-2015 time period, the major focus of the collaboration will be on data analysis. The Canadian team is proposing to develop a new TRIUMF T2K analysis centre with a data capacity of 150 terabytes; computing will take advantage of the existing WestGrid array. The goal is to be the primary site for analysis of data from both ND280 and Superkamiokande. Although the proposed analysis centre is smaller in scale than the ATLAS Tier-1 centre, the T2K analysis centre is critical to the collaboration and will provide TRIUMF-based Canadian intellectual leadership in this important neutrino experiment.

5.4 SNOLAB: Supporting the Laboratory's Success

SNOLAB is an underground facility nearing completion at the site of the highly successful SNO experiment, near Sudbury, Ontario; it is the deepest, lowest radioactivity laboratory in the world. The facility, together with the expertise developed during the operation of SNO, provides an unrivalled opportunity for Canada to develop the world's foremost program in several exciting areas: the study of low-energy solar- and geo-neutrinos; measurement of neutrino masses and investigation of the Majorana nature of neutrinos; searches for dark matter particles; and detection of supernovae neutrinos.

Several experiments are now being developed that will address all of these areas. Each of these experiments has international participation; most of them have Canadian scientific leadership. While the details of the experiments are varied, a common theme is that their success will require technical infrastructure available, in Canada, uniquely at TRIUMF: research and development, design, construction of particle detectors, electronics, cryogenic components, and data-acquisition systems.

The committee believes that TRIUMF support of SNOLAB experiments, as proposed in the Five-Year Plan, will help to leverage TRIUMF expertise to assure the success of a new world-class Canadian facility. As such, it is a sterling example of TRIUMF's role as a facilitator of exciting science.

6. MOLECULAR AND MATERIALS SCIENCE

Key elements

TRIUMF represents one of a handful of facilities in the world, and the only North American facility, able to use muons to probe local electromagnetic fields in any condensed matter system, providing experimental data of relevance to magnetic materials and superconductors as well as other materials where properties on the molecular and nanoscale are crucial.

Leveraging the investments in upgraded beamlines (M9A and M20) made by TRIUMF and CFI is a key element of the Plan.

The TRIUMF Centre for Molecular and Materials Science (CMMS) applies particle physics methods to problems in condensed matter physics, chemistry, and applied materials science. This involves the use of muons to probe local fields through a variety of techniques that rely on detection of the muon decay products and encoding in their momentum the muon's spin. Unlike similar NMR techniques, muons can be deposited in any material resulting in wide applicability to problems of interest that are impacting highly topical magnetic and superconducting materials. A new technique, which works in a similar fashion and exploits the radioactive beam capability of ISAC, is βNMR. This has the advantage of controlling the depth within a sample where the nuclei (^{8}Li) are deposited, providing a probe of surfaces and interfaces that is unique. Only cold muon beams offer similar selectivity. This is important because understanding interfaces is the key to controlling artificial nanostructures which have the potential to impact information technology, energy storage, and, in the case of surfaces, catalysis.

As a probe of local electromagnetic fields in condensed matter, muons and polarized nuclei have the advantage that, unlike NMR and nuclear quadrupole resonance (NQR), there is no reliance on a suitable nucleus being a constituent of the system under study. While the techniques are not routine in the condensed matter physics, chemistry, and materials communities, the information obtained is, in many cases, unique, and of importance – particularly in magnetic and superconducting materials. In addition to relying on the TRIUMF facility to produce the muon and polarized nuclei beams, this program is dependent on the in-house capabilities for detector and instrument development. TRIUMF also offers proton irradiation services to the semiconductor industry, providing the ability to test components and determine their resilience against single event upsets.

There are four facilities in the world that operate μSR programs, TRIUMF, J-PARC (coming online shortly and replacing the KEK facility, Japan), ISIS (UK), and PSI (Switzerland). PSI and TRIUMF are both continuous sources of muons. PSI operates at much higher intensities than TRIUMF, which has allowed them to develop cold muon beams suitable for the study of surfaces and interfaces, a capability TRIUMF is addressing by different means with βNMR. ISIS and the new J-PARC facility are pulsed which lends itself to different measurement schemes, although in all cases (pulsed, continuous, cold or not) the basic quantities being measured are the same. The other facilities are imbedded in much larger materials-based user facilities and, as a consequence, operate as user facilities in the mode now well established for x-ray and neutron sources, including sufficient staff to facilitate a high

throughput of non-expert users. The staffing levels of CMMS are somewhat lower and as a consequence there has been more emphasis on expert users and technique development. The TRIUMF program has, over the years, been responsible for the development of many of the measurement techniques that are now used in support of user programs at all of these facilities. Despite the lean staffing model, CMMS has been quite productive with publications in high impact journals since 2003 representing about 1/3 of the total world output in the field.

With the redevelopment of M9A and M20 using TRIUMF and CFI funds, respectively, there will be a significant improvement in the performance of the instrumentation. This will impact both the quality (through the use of muons on request) and the quantity (with the ability to run experiments in parallel on M20) of measurements. Without commensurate increases in staffing the full potential of these significant investments will not be realized. It is noteworthy that a majority of the scientific staff associated with CMMS operation is not employed by TRIUMF, even at a partial level, but are drawn from the ranks of faculty at the University of British Columbia and Simon Fraser University. The broader Vancouver-based group enjoys a strong reputation in the international community that has grown up around μSR. The work in magnetic materials and superconductors has high visibility in the broader condensed matter physics community.

The βNMR instrumentation that is operating in the ISAC hall shows promise for an important class of problems on the nanoscale. It is not as well established as the muon based methods and given the limitations on beamtime imposed by the multiple demands on the RIB target (4 ½ weeks last year) will not have as large a potential user base. It represents another example where TRIUMF is employing its expertise in the development of a new measurement tool.

The productivity of the user program (286 users total, 219 publications between 2004 and 2008, approximately 60 unique user visits per year) is consistent with international benchmarks taking the staffing level of about 7 FTEs into account. This has the potential to double based on the new instrumentation but this will depend on additional staff (funding for which has been requested from the NSERC Major Resources Support Program as well as the Five-Year Plan). As with any accelerator based user facility, beam availability and predictability are crucial determinants of success.

7. COMMERCIALIZATION AND ECONOMIC IMPACT

Key element

TRIUMF has an enviable and successful history of commercialization. The recent CECR award to establish AAPS Inc. puts it on track to double its economic impact over the next five years. The newly acquired core competencies broaden the opportunities for technology transfer particularly in the area of superconducting RF technology where commercialization opportunities are manifest in cryogenics, RF cavities and their associated instrumentation.

TRIUMF's direct economic impact is broad, and the degree of leveraging of the public investment is substantial. The current federal investment of about $44 million annually employs about 380 people, and stimulates more than $200 million of economic activity for Canada. TRIUMF's five year accumulated impact is projected to double to more than $1 billion over the period of the 2010-2015 Plan.

TRIUMF also recognizes the importance of the broader commercial impact of its activities. Bridging the academic and commercial sectors – one of the cornerstones of the federal government's Science and Technology Strategy – has been and continues to be – one of the laboratory's strengths.

In the past, commercialization based on TRIUMF work has fallen naturally into three categories: i) the use, by outside organizations, of TRIUMF expertise; ii) spin-off companies created by TRIUMF experts; iii) partnering with industry to solve problems that further TRIUMF's mission but may also be of commercial interest. In each of these three areas, TRIUMF can point to notable successes.

An example of the first is MDS Nordion, which licenses medical isotope production know-how from TRIUMF. The TRIUMF-MDS Nordion partnership was awarded a Synergy Award for Innovation by NSERC in 2004 and is now poised to expand further. Over the next few years, MDS Nordion will become an active partner – providing equipment and scientific personnel – in research into new isotope and radiotracer production techniques.

In the spin-off category is D-PACE Inc., a company providing particle transport systems and engineering to the particle accelerator industry. TRIUMF and D-PACE together won a Synergy Award for Innovation in 2007.

Finally, in the third category are companies like PAVAC Industries Inc. (of Richmond, B.C.) which, together with TRIUMF, has developed superconducting RF cavities using sophisticated vacuum welding techniques that are in themselves of interest to industry. These three factors – the importance of the e-linac to TRIUMF's Five-Year Plan, the growing world-wide interest in multi-cell superconducting cavities, and B.C.-based industrial expertise in this new technology – demonstrate the synergies that allow TRIUMF's core science mission to be leveraged for commercial success.

In order to further this mission of technology transfer, and in recognition of its success to date, the laboratory applied for and was successful in winning a Centre of Excellence in Commercialization and Research (CECR) grant from the federal government to establish Advanced Applied Physics Solutions Inc. (AAPS). AAPS' mandate is to fulfill the commercialization aspect of TRIUMF's research activities. The committee attended a presentation of AAPS activities and was impressed with the speed with which it has commenced its work, and with its ambitious goals for the next several years. These goals include approximately 10 patents per year based on TRIUMF's research, one to two start-up companies per year, and royalty income of $2 million/year.

While it is impossible to pre-judge AAPS' success at commercialization, the CECR award and its implementation are a strong indication of TRIUMF's recognition of the importance of technology transfer, and lend credence to its plans to double its economic impact over the course of the Five-Year Plan.

8. TRAINING AND OUTREACH

Key element

TRIUMF has had a substantial and high quality educational program commensurate with the scale and scope of its activities. The new initiatives will enrich all aspects of TRIUMF's education and training program.

TRIUMF has a strong training and educational program directed to the provincial, national and international academic community, to the school/science teacher community, and to the broader community and public. Its educational and training opportunities range from nuclear physics to other aligned sciences (chemistry, biology, etc.) to aligned technologies (cryogenics, electro-magnetism, etc.) and to business development and commercialization. The Five-Year Plan will augment and diversify the training, education and outreach programs of TRIUMF.

8.1 University Students

TRIUMF is led by a consortium of several universities across Canada. The research carried out at TRIUMF is central to the training of many undergraduate, graduate and doctoral students. TRIUMF is thus firmly engaged with students from local universities and also graduate students from institutions around the world who use the TRIUMF facilities. Approximately seventy percent (70%) of Canadian students in nuclear physics receive their training at TRIUMF. Currently, more than 500 top students perform research at TRIUMF each year. From 2003-2008, 319 undergraduate students and 300 graduate students worked on projects at TRIUMF and 223 students, in addition, from international locations completed their theses based on work done at TRIUMF.

Of note, in the course of its visit, the Committee met a number of students from diverse universities and countries who were involved in all facets of the program, from fundamental physics to health applications. The Committee was impressed with the enthusiasm and engagement of the students. The academic community network (from high school to institutional science organizations) is both evident and a testimony to TRIUMF's commitment to a sustainable and capable workforce.

The development of the Five-Year Plan is a result of a broad consultation within the academic research community. The entire program is university-led and aligned to the preparation, training and development of highly qualified personnel. TRIUMF undertakes experiments initiated from a variety of international academic locations and provides a unique environment in Canada for intellectual exchange, development and collaboration. It is also a "gateway" for access to other international physics and nuclear science facilities, thereby providing a rich training environment through networked collaborations and an opportunity to benefit from the academic cultures of diverse intellectual backgrounds.

TRIUMF provides scholarships, on-site experience, student-focused conferences and summer schools aimed at graduate students. It is clear that these summer schools provide a

crucial element in the education of all Canadian graduate students engaged with particle physics, and all aspects of nuclear science.

The strong relationships with Canadian universities (7 members, 7 associate members) is also evidenced by TRIUMF staff holding adjunct university professorships, providing teaching at various levels, the supervision of graduate students, and the establishment of an intellectual environment in public and academic sectors.

Through a variety of technical capabilities, TRIUMF provides training not only in the nuclear sciences but also cryogenics, electro-magnetism, radiochemistry, and engineering physics. It provides diverse opportunities for undergraduate and graduate students to access academia and industry through its unique linkage of nuclear, physical, chemical, and health sciences.

With the addition of activities, capabilities and capacities defined in the Five-Year Plan it is expected that additional educational activities can and will be achieved.

8.2 Outreach

TRIUMF has a long tradition of formal outreach programs with high school students, teachers and the public about the scope and excitement of its research. The outreach also emphasizes the value delivered to Canada through the development of knowledge, new technologies, applications of nuclear technology in important areas such as medicine, as well as the training of significant numbers of highly qualified people for the academic and industrial sectors. The 2010-2015 Plan builds on the successful programs and activities.

The Committee noted with interest the recent more professional approach to outreach consequent on a recent appointment of a head of Strategic Communications and Planning.

The TRIUMF Outreach program uses the laboratory facilities to provide stimulating and educational experiences for students of all ages, with a particular focus on high-school teachers and their students. The programs are designed to stimulate students' interests in the physical sciences and to provide teachers with relevant materials and "classroom" experiences. The programs are developed both in-house and through partnerships with both local and national science promotion groups.

9. MANAGEMENT

Key elements

TRIUMF is led by a very talented and capable management team which is fully qualified to successfully implement the Five-Year Plan in its entirety.

The Committee observed with satisfaction the enthusiasm and commitment noticeable at all levels of staff at TRIUMF, from the Director and his team, to students and technicians. There is an excellent spirit in the laboratory illustrating the excitement in the community for the program which was developed strategically as well as in conjunction with stakeholders.

The Committee was impressed with the vision, sound judgment, integrity, thoroughness and competence of the Director and his management team. These qualities were evident to the Committee even in the short period of time that the Committee had to visit the laboratory. Equally impressive was the depth of knowledge exhibited by the Director regarding all aspects of the diverse science program and its administration.

Management's commitment, as it should be, is to produce outstanding science and develop improved research tools. The current management team has demonstrated a strong sense of entrepreneurship in fortifying and extending the transfer of knowledge and technology from TRIUMF to the private sector.

TRIUMF Management is keenly aware of the public trust that attends the use of federal and provincial funding. One example of this is the active planning, the use of peer review and the incisiveness that were manifest in implementing a much improved optimization for the scheduling of beam time. There have been several excellent new hires at the upper management level (e.g., the head of the Accelerator Division and the head of Strategic Planning and Communication) and an infusion of excellent young talent. There have been some well-motivated organizational changes. Examples are the inclusion of a strategic planning group within the Director's Office; in the Accelerator Division the appointment of two deputy division heads and the establishment of new SCRF and Target/Ion Source departments; and the transfer of the in-house Technology Transfer Group to the semi-autonomous APPS entity.

The Committee takes note of the careful, step-by-step manner in which the Laboratory is approaching the introduction of actinide targets. The management has developed a close partnership with the Canadian Nuclear Safety Commission to ensure that the program poses no threat to human health.

The process for development of the Five-Year Plan is highly commendable for its inclusiveness, its thoroughness and the quality of the end product. The process was very transparent and all stakeholders had ample opportunity to make input at the outset and subsequently to participate in shaping the final product. Consequently there is very strong ownership and support for the Five-Year Plan by the laboratory staff and the scientific users.

The Committee has high confidence that the TRIUMF management has the enthusiasm, the talent, the management skill and experience to successfully implement all aspects of the Five-Year Plan.

APPENDIX A – PEER REVIEW COMMITTEE MEMBERSHIP

Chair

Prof. Dr. Rolf-Dieter Heuer
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Rolf-Dieter Heuer is a German particle physicist based at DESY (Hamburg) and trained at the University of Heidelberg. He was spokesperson for the OPAL experiment on the LEP accelerator at CERN in the 1990s. He has been a Professor at the University of Hamburg since 1998 and is currently DESY's Research Director. On January 1, 2009 he takes up the office of CERN's Director General.

Members

Professor Edwin Bourget
Vice-rectorat à la recherche et à la création
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Dr. Edwin Bourget is a professional oceanographer and marine ecologist. He was Vice President of Research at the Université de Sherbrooke before his present appointment as Vice President for Research and Innovation at the Université Laval.

Professor Jonathan M. Dorfan
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Jonathan Dorfan became the Stanford Linear Accelerator Center's third Director on September 1, 1999. An internationally recognized physicist, he was previously associate director of SLAC and head of its B-factory project. In recognition of his service at the helm of SLAC, he was made very recently SLAC Director Emeritus.

Professor Ian G. Halliday
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Following appointments as Professor of Theoretical Physics at Imperial College and then the University of Swansea, Ian Halliday served as Chief Executive of the UK's Particle Physics and Astronomy Research Council 1998-2005 before taking up, concurrently, the position of Chief Executive of the Scottish Universities Physics Alliance headquartered in Edinburgh University and President of the European Science Foundation in Strasbourg.

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Professor Langanke served as Professor in the Institute of Physics and Astronomy at Aarhus University in Denmark before taking up his present position as Professor at the Technical University of Darmstadt and as Head of Department of Theoretical Physics at GSI Helmholtz Centre in Darmstadt, Germany. Since 2006, Karlheinz Langanke also holds the position of Research Director at the GSI Helmholtz Centre.

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Dr. Thom Mason was appointed Director of Oak Ridge National Laboratory (ORNL) in July 2007, following his successful tenure since 2001 as Associate Director for the Department of Energy's Spallation Neutron Source at ORNL. As head of the SNS project, Mason led a consortium of six DOE laboratories in the design and construction of the $1.4 billion neutron accelerator, a flagship project in the field of neutron scattering and materials research.

Professor Shoji Nagamiya
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Professor Shoji Nagamiya has been Director of the J-PARC Center at KEK and Japan Atomic Energy Agency (JAEA) since 2006. Over ten years he has promoted construction of J-PARC. His research interests are in relativistic heavy-ion physics. He was the first spokesperson of PHENIX at Brookhaven National Laboratory. He was a professor at Colombia University, the University of Tokyo and KEK before taking up his present position.

Dr. Alan Pelman
Member of NRC Council and former Vice-President, Weyerhaeuser Ltd. (Canada)
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Recently retired as Vice President, Technology, Canada for Weyerhaeuser, Dr. Pelman began his career at Alcan Aluminium, becoming Director of Alcan's R&D Centre in Kingston, Ontario. Before moving to the forest industry in 1994, he was CEO of Powertech Labs, an R&D subsidiary of BC Hydro. For the past six years, Dr. Pelman has been a Member of NRC Council. He has served as Chair of the Canadian Advanced Industrial Materials Forum, Chair of the Innovation Management Association of Canada and as a member of the Government of Canada's National Advisory Board on Science and Technology. He currently is on the Board of Genome BC and serves as vice Chair.

Professor Kenneth J. Ragan
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Kenneth J. Ragan holds the William C. Macdonald Chair in Physics at McGill University in Montreal. His major research interests are currently in astroparticle physics, mainly carried out in the VERITAS collaboration operating a multi-telescope array in Arizona for the detection of high-energy cosmic gamma rays. He chaired the 2006 Subatomic Physics Long Range Panel, which resulted in the roadmap for the future of Canadian high-energy physics entitled: "Perspectives on Subatomic Physics in Canada 2006-2016."

Simon B. Sutcliffe, MD, FRCP, FRCPC
President
British Columbia Cancer Agency
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Simon Sutcliffe has practiced care in internal medicine, surgery, medical oncology and radiation oncology. His medical career includes research in microbiology and immunology, and clinical research in oncology. He was President and CEO of the Ontario Cancer Institute/Princess Margaret Hospital in Toronto.

Dr. Sutcliffe is President of the British Columbia Cancer Agency (BCCA). The Agency's mandate is to provide a population-based cancer control and care program for the public of British Columbia. In November 2006, he was appointed Vice Chairman - Canadian Partnership Against Cancer.

Dr. Robert E. Tribble
Professor of Physics and Director
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Robert E. Tribble is Professor of Physics and Director of the Cyclotron Institute at Texas A&M University. His research work centres on experiments to elucidate the structure of exotic nuclei, nuclear symmetries, and in the domain of nuclear and particle astrophysics. Since December, 2005, he has chaired the U.S. Nuclear Science Advisory Committee and was the principal author of the 2007 U.S. Long Range Plan: Frontiers for Nuclear Science.

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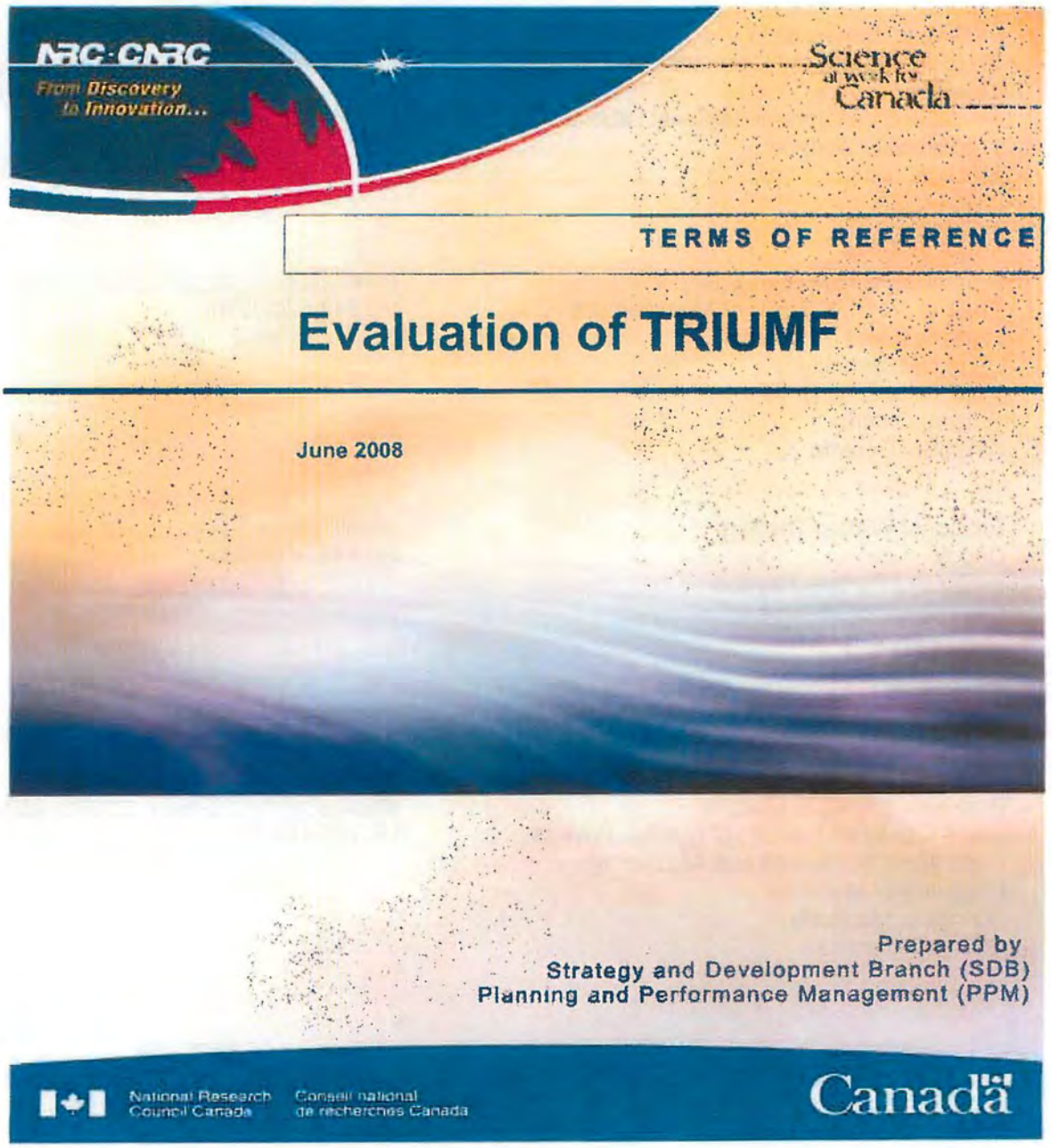
APPENDIX B – PEER REVIEW COMMITTEE TERMS OF REFERENCE



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CONTEXT

An evaluation of TRIUMF has been scheduled to take place in fiscal year 2008-2009. The evaluation is being carried out in accordance with the National Research Council's approved evaluation plan for 2008-2009 and the policies of the Government of Canada's Treasury Board Secretariat (TBS).

The evaluation will take the form of a peer review and focus primarily on issues related to relevance, success, level of scientific excellence and future opportunities for TRIUMF. The last peer review of TRIUMF was conducted in September 2003.

These Terms of Reference were prepared by NRC's Corporate Services, Strategy and Development Branch, Planning and Performance Management (SDB-PPM) in consultation with the Director Physical Sciences, the NRC Vice-President Physical Sciences and TRIUMF management.

After being approved by NRC Senior Executive Committee (SEC) in June 2008, the Terms of Reference for this evaluation were provided to the Evaluation, Audit and Risk Management Standing Committee of NRC's Governing Council for information purposes.

OVERVIEW OF TRIUMF

TRIUMF was established in 1968 and began operation in 1975 as Canada's largest single-purpose national facility for research in sub-atomic physics. It is managed as a joint venture by a consortium of seven universities (Carleton University, Simon Fraser University, University of Alberta, University of British Columbia, Université de Montréal, University of Toronto and University of Victoria). Six additional universities (McMaster University, Queen's University, University of Guelph, University of Manitoba, University of Regina and St. Mary's University) are associate members.

TRIUMF is operated under a contribution from the Government of Canada through the National Research Council of Canada (NRC). The province of British Columbia provides building funds. In addition to this, TRIUMF scientists and Canadian university researchers are eligible for Natural Sciences and Engineering Research Council (NSERC) grants. TRIUMF is a partner in a number of Canada Foundation for Innovation (CFI) projects. Exhibit 1 below displays the total expenditures for TRIUMF from fiscal years 2005/06 to 2009/10.

Exhibit 1: Total Expenditures for TRIUMF from 2005-2006 to 2009-2010 (in millions of dollars)

	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010 (estimated)	Total
TRIUMF Expenditures	44.0	45.5	45.3	44.0	43.5	222.3

TRIUMF has also been able to supplement its base funding by another $25 million approximately, in particular for the ATLAS Tier-1 Data Centre. In the period 2005-2006 to 2009-2010, TRIUMF therefore received $247.3 million from the Canadian federal government.

In 2005, Canada's Federal Cabinet approved a five-year plan for TRIUMF that provided funding for the facility for the period of 2005-2006 to 2009-2010. As part of that approval, Ministers

directed that an independent scientific and management review of TRIUMF must be conducted. A peer review that will examine relevance, success, scientific excellence and future opportunities of TRIUMF has been scheduled for fiscal year 2008-2009. The peer review is being carried out at the request of NRC's Senior Executive Committee (SEC), as well as in accordance with Treasury Board Secretariat (TBS) policies. The peer review report will provide important input into the request for future funding.

PURPOSE OF THE PEER REVIEW COMMITTEE

The TRIUMF Peer Review will be both retrospective and prospective in nature.

By examining activities from 2005 to date, the Peer Review Committee will seek to examine[1]:

TRIUMF's relevance. *The extent to which TRIUMF addresses the needs of the Canadian R&D community and Canadian industry.*

TRIUMF's success. *The extent to which TRIUMF has been operating effectively and efficiently to achieve its objectives as outlined in the NRC Contribution to TRIUMF Agreement, Annex A.*

TRIUMF's level of scientific excellence. *The extent to which TRIUMF's research activities and researchers are viewed as excellent.*

Prospectively, the Peer Review Committee will comment on the proposed 5-year plan put forward by TRIUMF as well as identify:

Opportunities and future direction for TRIUMF. *Opportunities for the facility to improve the effectiveness and efficiency of its performance based upon the current and future needs of Canada's particle and nuclear physics community.*

The Peer Review Committee's report will become and public document and will be included in the request for future funding.

COMMITTEE MEMBERSHIP

Committee members will be selected in consultation with NRC's President. The Committee's membership will be drawn from national and international academia, other government laboratories/departments, and relevant public and private sector organizations.

Selection is based on members' qualifications in the areas being peer reviewed, their credibility, and their reputation for objectivity and neutrality. As well, efforts are made to form a balanced Committee taking into consideration such criteria as sector and region. Members should be able to participate in the process in an objective, unbiased and credible manner. There should be no apparent or potential conflict of interest.

ORGANIZATION OF THE COMMITTEE

The TRIUMF Peer Review Committee will be made up of 10-12 individuals external to TRIUMF and NRC, who possess expertise in TRIUMF's research areas. One member will act as Chair of the Committee. At the discretion of the Chair, sub-committees may also be established.

[1] If a new Government of Canada Policy on Evaluation comes into effect early in 2008-2009, these issues will be updated to reflect any substantive changes in policy.

A representative from NRC Strategy and Development Branch will act as Secretariat to the Committee.

PEER REVIEW PROCESS

The TRIUMF peer review process will include three components. As part of the Committee, members are responsible for:

- becoming familiar with the research activities and management practices of TRIUMF and reviewing briefing materials;
- attending and actively participating in the peer review process including the site visit (with exceptions - e.g., illness, change in status of representation);
- providing input into the peer review report; and
- reviewing the draft peer review report and providing written comments.

Briefing material will be sent out to Peer Review Committee members for their review prior to the site visit. This material will include the Five-Year Plan submitted by TRIUMF outlining the facility's planned future activities. A number of other documents such as TRIUMF's Annual Report on Scientific Activities, TRIUMF's Annual Financial & Administrative Report, the TRIUMF Small Business Development Plan, TRIUMF Technology Transfer Bulletins and Reports from the Advisory Committee on TRIUMF will also be included.

PROJECT TIMELINES

The peer review process will include a three day on-site visit at TRIUMF in Vancouver, British Columbia. The visit is presently scheduled for **24-26 September 2008**. The visit will include presentations and discussions on past, current and proposed research activities, as well as tours of TRIUMF facilities.

Following its review of the TRIUMF's activities, the Peer Review Committee will identify key findings, conclusions and recommendations to include in the Peer Review Report. Further, the Committee may elect to debrief the facility's Director on its initial findings as part of the review.

NRC Strategy and Development Branch will support the writing of the peer review report. Committee members will be requested to provide comments on the draft and final versions of the peer review report within approximately one month of the site-visit.

ESTIMATED PROJECT COSTS

The estimated cost for the project is $55,000, including travel and hospitality expenses. The cost of the project is covered by SDB-PPM's budget allocation.

PROJECT CLIENTS AND STAKEHOLDERS

The primary clients for this evaluation are:

- President, NRC;
- NRC's Senior Executive Committee (SEC) which comprises the President, Vice-Presidents and the Secretary General;
- Audit, Evaluation and Risk Management Standing Committee of NRC Governing Council;

- Vice President, Physical Sciences; and
- Director of TRIUMF.

Stakeholders include:

- Internal and external collaborators and partners;
- Related industry;
- Other federal government organizations such as the Natural Sciences and Engineering Research Council;
- Treasury Board Secretariat;
- Office of the Auditor General; and
- Finance Canada.

PROJECT GOVERNANCE

The Planning and Performance Management (PPM) Directorate of the Strategy and Development Branch (SDB) at NRC will manage the project. Accountabilities and responsibilities have been defined below.

Project Manager:
Dr. Walter Davidson
Director, NRC Physical Sciences
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Peer Review Coordinator:
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Exhibit 2: Project Management

Individual	Roles/Responsibilities
Director General, Strategy and Development Branch (SDB)	Will maintain, on behalf of SDB, overall responsibility for the project.
Director, SDB-Planning and Performance Management (PPM)	Will maintain, on behalf of SDB-PPM, overall accountability for the project.
Project Manager, VP Physical Sciences Office	Will maintain, on behalf of NRC, responsibility for day-to-day management of the project.
Peer Review Coordinator, SDB-PPM	Will be responsible for logistics of the site visit and act as the secretary to the TRIUMF peer review committee.

Exhibit 3: Project Direction

Individual(s)	Roles/Responsibilities
President, NRC	Will review key deliverables, including the draft Terms of Reference and draft Evaluation Report. The Secretary General will support his efforts.
NRC Senior Executive Committee (SEC)	Will review and, ultimately, endorse the Terms of Reference for the project as well as the Report of the Peer Review Committee.
Vice-President, Physical Sciences	Will provide input into evaluation issues and the peer review methodology and will review key deliverables including the draft Evaluation Report. The VP Physical Sciences will approve the management response to the evaluation recommendations. The VP's efforts will be supported by his Executive Director.
Director, TRIUMF	Will provide input into key evaluation issues and the peer review methodology and will review key deliverables including the draft report of the Peer Review Committee. He will be responsible for generating a Management Response and Action Plan following delivery of the recommendations of the peer review committee and for following up on any recommendations.

Exhibit 4: Project Integrity

Individual(s)	Roles/Responsibilities
SDB-PPM	The Director of SDB-PPM and senior evaluators will be responsible for overseeing the day-to-day operations of the peer review. This will include regular communication with NRC management, the Chair of the peer review committee and the Director of TRIUMF.
Audit, Evaluation and Risk Management Standing Committee of NRC Council	The Standing Committee will be kept abreast of the peer review and will receive key deliverables (e.g., Terms of Reference and Final Report of the Peer Review Committee).

COMMUNICATIONS

NRC will communicate with Committee members primarily by e-mail and telephone. However, briefing material on TRIUMF will be couriered to Committee members prior to the site-visit for their review. All enquiries about the logistics of the peer review process may be directed to Jennifer Birta.

TRAVEL

All members of the TRIUMF Peer Review Committee will be reimbursed for travel expenses in accordance with NRC administrative policy. NRC Strategy and Development Branch will assist in making travel arrangements, including hotel reservations. NRC Strategy and Development Branch may also provide recommendations with respect to air/ground transportation. It is the members' responsibility to submit travel claims in a timely manner (i.e., 2 to 3 weeks following travel).

APPENDIX C – PEER REVIEW COMMITTEE SITE VISIT AGENDA

grey highlighted sessions are open to all
white highlighted sessions are only for groups specified

Wednesday, 24 September 2008

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

7:30 a.m.	**Meet in hotel lobby**
7:30-8:00 a.m.	**Transportation to TRIUMF**
8:00-8:40 a.m.	**Breakfast at TRIUMF (MOB Conference Room)** **Introductions and Introductory Remarks** *P. Coulombe, NRC President* *R. Heuer, Peer Review Committee Chair* *Peer Review Committee*
8:40-8:55 a.m.	**Welcome from the National Research Council** *P. Coulombe, President, National Research Council Canada*
8:55-9:00 a.m.	**Welcome from the TRIUMF Board of Management** *F. Hamdullahpur, Chair, TRIUMF Board of Management*
9:00-9:10 a.m.	**TRIUMF Five-Year Planning Process** *presenter: T.I. Meyer, TRIUMF*
9:10-10:00 a.m.	**Overview of TRIUMF and the 2010-2015 Plan** *presenter: N. S. Lockyer, Director, TRIUMF*
10:00-10:30 a.m.	**Presentation by the Advisory Committee on TRIUMF (ACOT)** *Presenter: R. Janssens, Chair, ACOT*
10:30-10:45 a.m.	**Health/Coffee Break**
10:45-11:15 a.m.	**TRIUMF's Academic, Business, and Industrial Partnerships** *presenter: T.I. Meyer, TRIUMF* (20 min. presentation, 10 min. question period)
11:15-11:20 a.m.	**Introduction to TRIUMF and Nuclear Physics** *presenter: N. S. Lockyer, Director, TRIUMF* (5 min. presentation)

Wednesday, 24 September 2008 (continued)

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

11:20-11:50 a.m.	**Nuclear Physics #1: Overview of ISAC Science** *presenter: J. Dilling, TRIUMF* (20 min. presentation, 10 min. question period)
11:50 a.m. -12:00 p.m.	**Student Talk #1: TITAN** *presenter: M. Smith* (8 min. presentation, 2 min. question period)
12:00-12:45 p.m.	**Lunch at TRIUMF (MOB Conference Room)** **In-camera Committee Discussions**
12:45-1:05 p.m.	**Nuclear Physics #2: Nuclear Halo and Skin: Past & Future** *presenter: R. Kanungo, Saint Mary's University* (15 min. presentation, 5 min. question period)
1:05-1:25 p.m.	**Nuclear Physics #3: Nuclear Astrophysics: Past & Future** *presenter: C. Ruiz, TRIUMF* (15 min. presentation, 5 min. question period)
1:25-1:45 p.m.	**Nuclear Physics #4: New Directions in Theory: Past & Future** *presenter: A. Schwenk, TRIUMF* (15 min. presentation, 5 min. question period)
1:45-2:25 p.m.	**Nuclear Physics #5: Nuclear Structure & Fundamental Symmetries** *presenter: C. Svensson, University of Guelph (2008 E.W.R. Steacie Fellowship Winner, 2008 CAP Herzberg Medal Winner)* (30 min. presentation, 10 min. question period)
2:25-2:30 p.m.	**Introduction to TRIUMF and Accelerators** *presenter: N. S. Lockyer, Director, TRIUMF* (5 min. presentation)
2:30-2:50 p.m.	**Accelerators #1: Preparation of Rare-Isotope Beams** *presenter: P. Bricault, TRIUMF* (15 min. presentation, 5 min. question period)
2:50-3:05 p.m.	**Health/Coffee Break**
3:05-3:25 p.m.	**Accelerator #2: Enhancing Beam Delivery & Growing SRF Technology** *presenter: R. Laxdal, TRIUMF* (15 min. presentation, 5 min. question period)
3:25-3:35 p.m.	**Student Talk #2: Accelerator Physics** *presenter: A. Grasselino, University of Pennsylvania* (8 min. presentation, 2 min. question period)

Wednesday, 24 September 2008 (continued)

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

3:35-3:55 p.m.	**Accelerators #3: The E-Linac Initiative** *presenter: S. Koscielniak TRIUMF* (15 min. presentation, 5 min. question period)
3:55-4:20 p.m.	**Accelerators #4: Outlook and New Directions** *presenter: L. Merminga, Head, Accelerator Division, TRIUMF* (20 min. presentation, 5 min. question period)
4:20-5:30 p.m.	**Student Poster Session (ISAC II Lobby)** *introduction: J.-M. Poutissou, Associate Director, TRIUMF*
5:30-6:30 p.m.	**In-camera Committee Discussions (MOB Conference Room)**
6:30-7:00 p.m.	**Return to hotel**

Windows on the Bay Restaurant, Coast Plaza Hotel & Suites, 35th Floor
Vancouver

7:00-7:30 p.m.	**Reception** *Peer Review Committee Members* *TRIUMF guests* *NRC representatives and observers*
7:30-9:00 p.m.	**Dinner** *Peer Review Committee Members* *TRIUMF guests* *NRC representatives and observers*
9:00 p.m.	**Adjournment**

Thursday, 25 September 2008

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

7:30 a.m.	**Meet in hotel lobby**
7:30-8:00 a.m.	**Transportation to TRIUMF**
8:00-8:40 a.m.	**Breakfast at TRIUMF (MOB Conference Room)** **In-camera Committee Discussions**

Thursday, 25 September 2008 (continued)

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

8:40-8:45 a.m.	**Introduction to TRIUMF and Particle Physics** *presenter: N. S. Lockyer, Director, TRIUMF* (5 min. presentation)
8:45-9:05 a.m.	**Particle Physics #1: Particle Physics at TRIUMF** *presenter: D. Morrissey, Harvard University/TRIUMF* (15 min. presentation, 5 min. question period)
9:05-9:25 a.m.	**Particle Physics #2: The T2K Experiment** *presenter: H. Tanaka, Institute of Particle Physics/University of British Columbia* (15 min. presentation, 5 min. question period)
9:25-9:45 a.m.	**Particle Physics #3: SNOLAB** *presenter: A. McDonald, Queen's University (CAP Medal of Achievement)* (15 min. presentation, 5 min. question period)
9:45-10:05 a.m.	**Particle Physics #3: ATLAS Canada** *presenter: R. McPherson, Institute of Particle Physics/University of Victoria, ATLAS Canada Spokesperson* (15 min. presentation, 5 min. question period)
10:05-10:15 a.m.	**Student Talk #3: Particle Physics** *presenter: L. Courneya, University of Victoria* (8 min. presentation, 2 min. question period)
10:15-10:30 a.m.	**Health/Coffee Break**
10:30-10:35 a.m.	**Introduction to TRIUMF and Materials Science** *presenter: N. S. Lockyer, Director, TRIUMF* (5 min. presentation)
10:35-10:55 a.m.	**Materials Science #1: Highlights of μSR** *presenter: J. Brewer, University of British Columbia (2007 CAP Brockhouse Award Winner)* (15 min. presentation, 5 min. question period)
10:55-11:15 a.m.	**Materials Science #2: β–NMR and Novel Materials** *presenter: A. Macfarlane, University of British Columbia* (15 min. presentation, 5 min. question period)
11:15-11:25 a.m.	**Student Talk #4: Materials Science with β–NMR** *presenter: H. Saadoui, University of British Columbia* (8 min. presentation, 2 min. question period)

Thursday, 25 September 2008 (continued)

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

11:25-11:30 a.m.	**Introduction to TRIUMF and Life Sciences** *presenter: N. S. Lockyer, Director, TRIUMF* (5 min. presentation)
11:30-11:50 a.m.	**Life Sciences #1: Pacific Parkinson's' Research Centre** *presenter: J. Stoessl, C.M, Director, Pacific Parkinson's Research Centre* (15 min. presentation, 5 min. question period)
11:50 a.m.-12:10 p.m.	**Life Sciences #2: Oncology and Molecular Imaging** *presenter: F. Benard, University of British Colombia, LEEF Chair* (15 min. presentation, 5 min. question period)
12:10-1:05 p.m.	**Lunch at TRIUMF (MOB Conference Room)** **In-camera Committee Discussions**
1:05-1:20 p.m.	**Life Sciences #3: Radiochemistry at TRIUMF** *presenter: M. Adam, TRIUMF* (10 min. presentation, 5 min. question period)
1:20-1:35 p.m.	**Life Sciences #4: National Proposal on Radio-tracer Development** *presenter: T. Ruth, TRIUMF* (10 min. presentation, 5 min. question period)
1:35-1:50 p.m.	**Life Sciences #5: Cyclotron Systems for Nuclear Medicine** *presenter: C. Hoehr, TRIUMF* (10 min. presentation, 5 min. question period)
1:50-2:00 p.m.	**Student Talk #5: Life Sciences** *presenter: S. Haroun, Simon Fraser University* (8 min. presentation, 2 min. question period)
2:00-2:05 p.m.	**Introduction to TRIUMF and Commercialization** *presenter: N. S. Lockyer, Director, TRIUMF* (5 min. presentation)
2:05-2:20 p.m.	**Commercialization #1: Superconducting RF Cavities** *presenter: R. Edinger, President, PAVAC Industries, Inc.* (15 min. presentation)
2:20-2:35 p.m.	**Commercialization #2: Added-Value Medical Isotopes** *presenter: P. Covitz, Sr. VP Innovation, MDS Nordion* (15 min. presentation)

Thursday, 25 September 2008 (continued)

TRIUMF Auditorium, 4004 Wesbrook Mall
Vancouver

2:35-2:50 p.m.	**Commercialization #3: Advanced Applied Physics Solution, Inc.** *presenter P. Gardner, CEO, AAPS, Inc* (15 min. presentation)
2:50-3:05 p.m.	**Health/Coffee Break**
3:05-3:35 p.m.	**Panel Discussion on "Business Opportunities and TRIUMF"** *participants. R. Edinger, P. Covitz, P. Gardner, E. Odishaw (AAPS, Inc.), A. Fong (AAPS, Inc.), M. Dehnel (D-Pace, Inc.), E.W. Blackmore (TRIUMF)*
3:35-5:05 p.m.	**Tour of Facilities and Breakout Sessions** Peer Review Committee splits into five sub-groups
5:05-6:00 p.m.	**In-camera Committee Discussions (MOB Conference Room)**
6:00-6:30 p.m.	**TRIUMF's 5-year Plan Working Group (MOB Conference Room)** *Questions and Answers*
6:30-7:00 p.m.	**Return to hotel**

C Restaurant
2-1600 Howe Street, Vancouver

7:30-8:00 p.m.	**Transportation to Restaurant**
8:00-9:30 p.m.	**Dinner** *Peer Review Committee Members* *Federal government representatives*
9:30 p.m.	**Adjournment**

Friday, 26 September 2008

TRIUMF, MOB Conference Room, 4004 Wesbrook Mall
Vancouver

7:30 a.m.	**Meet in hotel lobby** *Peer Review Committee Members* *NRC representatives*
7:30-8:00 a.m.	**Transportation to TRIUMF**
8:00-10:00 a.m.	**Breakfast at TRIUMF** **In-camera Committee Discussions**

Friday, 26 September 2008 (continued)

TRIUMF, MOB Conference Room, 4004 Wesbrook Mall
Vancouver

10:00-10:15 a.m.	**Health/Coffee Break**
10:15 a.m.-12:00 p.m.	**In-camera Committee Discussions**
12:00-1:00 p.m.	**Lunch at TRIUMF**
1:00-3:00 p.m.	**In-camera Committee Discussions**
3:00-3:15 p.m.	**Health/Coffee Break**
3:15-4:15 p.m.	**Debriefing of TRIUMF Director by Peer Review Committee** *Peer Review Committee Members* *N. S. Lockyer, Director, TRIUMF*
4:15-6:00 p.m.	**In-camera Committee Discussions**
6:00-6:30 p.m.	**Return to hotel**

Seasons in the Park
West 33rd Avenue and Main St., Vancouver

7:00-8:30 p.m.	**Dinner (optional)** *Peer Review Committee Members* *TRIUMF guests* *NRC representatives and observers*
8:30 p.m.	**Adjournment**

Saturday, 27 September 2008

Coast Plaza Hotel & Suites, Room TBD
Vancouver

9:00 a.m.-12:00 p.m.	**In-camera Committee Discussions (optional)** *Peer Review Committee Members* *NRC representatives*

APPENDIX D – DOCUMENTS PROVIDED TO THE PEER REVIEW COMMITTEE

The following documents were provided to members of the Peer Review Committee prior to the site visit.

Information on TRIUMF

TRIUMF Five-Year Plan 2010-2015, *Building a Vision for the Future*
TRIUMF Business Development Plan Annual Report, April 1, 2007 to March 31, 2008
Schedule "A" from the NRC TRIUMF contribution agreement
Report of the Advisory Committee on TRIUMF Twenty-Fourth Meeting, dated May 2008
Report of the Advisory Committee on TRIUMF Twenty-Third Meeting, dated November 20, 2007
Final Report of the Peer Review Committee on TRIUMF, dated 21 October 2003

Peer Review Committee

Membership List
Agenda for Site Visit

Peer Review Project

Terms of Reference for Peer Review Committee
Confidentiality and Conflict of Interest Information

APPENDIX E – LIST OF ACRONYMS

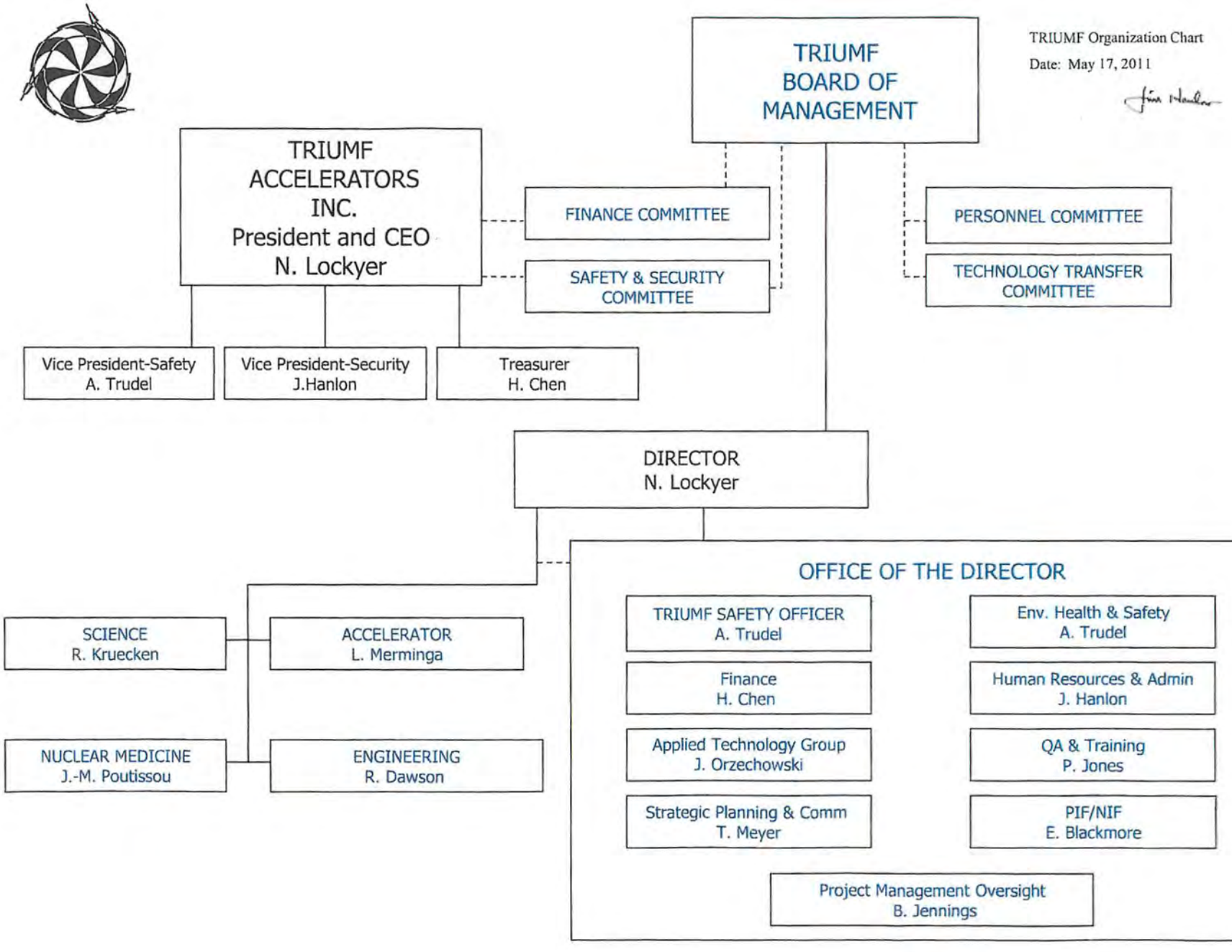
Acronyms that appear in this report.

AAPS	Advanced Applied Physics Solutions Inc. (AAPS), a wholly owned, not-for-profit subsidiary of TRIUMF
ACOT	Advisory Committee on TRIUMF
ATLAS	Name for a detector located on the LHC at CERN
β-NMR	Nuclear Magnetic Resonance with radioactive nuclei
CECR	Centres of Excellence for Commercialization and Research
CERN	Centre for Nuclear and Particle Physics in Geneva, Switzerland
CFI	Canada Foundation for Innovation
CMMS	Centre for Molecular and Materials Science at TRIUMF
CP	Charge Parity inversion
EDM	Electric dipole moment
EMMA	Electro Magnetic Mass Analyzer
FEBIAD	Forced Electron Beam Ion Arc Discharge
FTE	Full Time Equivalent
ISAC	Isotope Separator and Accelerator
ISOL	Isotope Separation On-Line
ISIS	a pulsed neutron and muon source, at the Rutherford Appleton Laboratory near Oxford, United Kingdom
J-PARC	Japan Proton Accelerator Research Complex
KEK	Name for Japan's High Energy Accelerator Research Organization
LHC	Large Hadron Collider at CERN
HQP	Highly qualified personnel
μSR	Muon Spin Resonance
MW	Megawatt
NMR	Nuclear Magnetic Resonance
NQR	Nuclear Quadrupole Resonance
NRC	National Research Council Canada
NSERC	Natural Sciences and Engineering Research Council
PET	Positron Emission Tomography
PSI	Paul Scherrer Institute in Switzerland, a multi-disciplinary research centre for natural sciences and technology
R&D	Research and Development
RIB	Radioactive Ion Beam
RF	Radiofrequency
SC	Superconducting
SLAC	Stanford Linear Accelerator Center
SM	Standard Model
SNO	Sudbury Neutrino Observatory
SNOLAB	International Facility for Underground Science at Sudbury
T2K	Next-generation long baseline neutrino oscillation experiment in Japan
TITAN	TRIUMF Ion Trap for Atomic and Nuclear Science

TRIUMF	Canada's national laboratory for particle and nuclear physics
TIGRESS	TRIUMF ISAC Gamma Ray Escape Suppressed Spectrometer
TITAN	TRIUMF Ion Trap for Atomic and Nuclear Science
USA	United States of America

Attachment II

TRIUMF Organization Chart


TRIUMF Organization Chart
Date: May 17, 2011
TRIUMF BOARD OF MANAGEMENT
TRIUMF ACCELERATORS INC. President and CEO N. Lockyer
FINANCE COMMITTEE
SAFETY & SECURITY COMMITTEE
PERSONNEL COMMITTEE
TECHNOLOGY TRANSFER COMMITTEE
Vice President-Safety A. Trudel
Vice President-Security J.Hanlon
Treasurer H. Chen
DIRECTOR N. Lockyer
OFFICE OF THE DIRECTOR
TRIUMF SAFETY OFFICER A. Trudel
Env. Health & Safety A. Trudel
Finance H. Chen
Human Resources & Admin J. Hanlon
Applied Technology Group J. Orzechowski
QA & Training P. Jones
Strategic Planning & Comm T. Meyer
PIF/NIF E. Blackmore
Project Management Oversight B. Jennings
SCIENCE R. Kruecken
ACCELERATOR L. Merminga
NUCLEAR MEDICINE J.-M. Poutissou
ENGINEERING R. Dawson

Attachment III

Board of Management Membership List

TRIUMF BOARD OF MANAGEMENT 2011

Full Member Universities

University of Alberta

Dr. R. Fedorak (Richard)
Associate Vice-President, Research
University of Alberta
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Edmonton, AB T6G 2R1

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Fax: 780-492-3189
Email: richard.fedorak@ualberta.ca
Committees: Executive; Finance

Dr. A. Hallin (Aksel)
Centre for Particle Physics
University of Alberta
445 CEB
11322-89th Avenue
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Committees: Personnel & Admin

University of British Columbia

Dr. J. Hepburn (John)
Vice-President, Research
University of British Columbia
Old Admin Bldg, Rm 224
Vancouver, BC V6T 1Z2

Term expires: June/13
Tel: 604-822-1995
Fax: 604-822-6295
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Committees: TBA

Dr. D. Brooks (Don)
Associate Vice-President, Research
University of British Columbia
Old Admin Bldg., Rm 209
Vancouver, BC V6T 1Z2

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Committees: Finance, Tech Transfer

Carleton University

Dr. K. Matheson (Kimberly)
Vice President (Research & International)
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1125 Colonel By Drive
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Tel: 613-520-3570
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Dr. P. Kalyniak (Patricia)
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1125 Colonel By Drive
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Committees: Personnel & Admin

University of Guelph

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Committees: tba

Dr. A. Vannelli (Tony)
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Engineering Science
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Committees: tba

University of Manitoba

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Fax: 204-474-
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Université de Montréal

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Faculty of Arts & Sciences
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Dr. C. Leroy (Claude)
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Montréal, QC H3T 1J4

Queen's University

Dr. S. N. Liss (Steven)
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Simon Fraser University

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University of Toronto

Dr. R. P. Young (Paul)*
Vice-President, Research
University of Toronto
Simcoe Hall
27 King's College Circle, Rm 109
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Term expires: June/09
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Dr. R. Orr (Robert)
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Committees: Personnel & Admin

University of Victoria

Dr. H. Brunt (Howard)
Vice-President, Research
University of Victoria
Business & Economics Bldg, Rm 424
Victoria, BC V8W 2Y2

Term expires: Nov/13
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Dr. R. V. Kowalewski (Robert)
Chair, Dept. of Physics &
Astronomy
University of Victoria
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Term expires: Oct/10
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Committees: Personnel & Admin

York University

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Associate Vice-President Research,
Science & Technology
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Term expires: Oct/11
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Term expires: Sept /12
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Committees: Personnel & Admin

Associate Member Universities (Non-Voting)

University of Calgary

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Science B605
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Calgary, AB T2N 1N4

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Fax: 403-289-3331
Email: thompson@phas.ucalgary.ca
Committees: N/A

McMaster University

TBA
McMaster University
1280 Main Street West
Hamilton, ON L8S 4M1

Term expires:
Tel:
Fax:
Email:
Committees: N/A

University of Northern British Columbia

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University of Regina

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Saint Mary's University

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University of Winnipeg

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University of Winnipeg
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Term expires: May/14
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Fax: 204-783-8910
Email: n.besner@uwinnipeg.ca
Committees: N/A

Private Sector Representative

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Term expires: Apr/11
Tel: 604-669-8929; Cell: 604-418-8183
Fax: 604-926-5757
Email : eaoaustpro@shaw.ca
Committees: Tech Transfer

Dr. P. Covitz (Peter)
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MDS Nordion
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Email: Peter.Covitz@mdsinc.com
Committees: N/A

Ex-Officio Members
TBA
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Tel:
Fax:
Email:

Dr. N. Lockyer (Nigel)
TRIUMF
4004 Wesbrook Mall
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Director
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Fax: 604-222-3791
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Mr. J. Hanlon (Jim)
TRIUMF
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Secretary
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Email: jimh@triumf.ca

Dr. D. B. MacFarlane (David)
Associate Laboratory Director
Stanford Linear Accelerator
2575 Sand Hill Road, MS75
Menlo Park, CA 94025

Chair-ACOT
Tel: (650) 926-3406
Fax:
Email: dbmacf@slac.stanford.edu

Invited to Attend : Reiner Kruecken (Head, Science Division) ; Henry Chen (TRIUMF CFO) ; Tim Meyer (Head, Strategic Planning & Communications).

Sub-committees of the Board of Management
Finance – D. Brooks, Chair. Secretary – H. Chen.
Personnel & Admin – P. Kalyniak, Chair. Secretary – J. Hanlon.
Environmental Safety & Security – R. Thompson, Co-Chair and A. Sarty, Co-Chair. Secretary – J. Hanlon.
Executive – K. Matheson, N. Haunerland, R. Fedorak, D. Jayas, D. Brooks, K. Hall, H. Brunt, S. Liss, R. Paul Young, M. Siu, L. Lewis.
Technology Transfer: S. Liss, Chair. Secretary – J. Hanlon.

*Chair, TRIUMF Board of Management

Updated: May 20, 2011

RESEARCH CENTRE/INSTITUTE RENEWAL APPLICATION
Reporting Period: April 1, 2006 March 31 2011

Pursuant to S.F.U. Policy R40.01, the Director of each Research Centre or Institute (hereafter referred to as "the Centre") is required to submit a renewal application every five years.

Once the Director of the Centre completes the form, it should be forwarded to the Faculty Dean or Vice-President Research, no later than June 30th.

1. Name of the Centre: **Western Canadian Universities Marine Sciences Society (Bamfield Marine Sciences Centre - BMSC)**

2. Director of the Centre

Name: Brad Anholt Phone Number: 250-728-3301

Expiry Date of Term as Director: 1.July 2013 Fax Number: 250-728-3452

Office Location: Bamfield Marine Sciences Centre Director's Email: director@bms.bc.ca

Web Address of Centre: bms.bc.ca

Generic Centre Email: info@bms.bc.ca

3. Centre Description: (The description below was taken from the most recent SFU Calendar.)

This society was founded in 1969 with the objective of operating a major research and teaching facility in coastal and marine sciences. The Bamfield Marine Sciences Centre offers year round research facilities that enable resident and visiting scientists and students (MSc and PhD) to develop a range of research programs. Courses that lead to academic credit for undergraduate and graduate degree programs at member universities are given at the station. The centre also runs a public education program from September through April.

4. Provide a detailed list of accomplishments of the Centre for the past five years.

In the last 3 years we have had major staff renewal. New director, business manager, university programs coordinator, research coordinator, dive safety officer, and IT specialist. This new team has

- completely reworked our accounting system and we now have a clear understanding of our finances.
- enhanced our facilities with new autoclave, GC mass spectrometer, high magnification research stereomicroscope, renovated lab space, renovated dorms for researchers.
- put in place numerous policies to ensure that we meet regulatory compliance.

- renewed our NSERC Major Resource Support grant with an increase from $349K p.a. to $400K p.a.
- established a new collections database with GIS front end to keep track of our historical and modern collection records.
- Increased our researcher use by >5% annually
- Increased the number of undergraduates
- Created a two-year rotation of undergraduate courses
- Added new courses to diversify our offerings including scientific filmmaking, science journalism, and ecological modeling.
- Planning stages for Coastal Archaeology and Biostatistics

5. Has your Centre accomplished its goals?

BMSC is in the process of writing a new strategic plan. The previous version from six years ago, only existed in draft form. However, we continue to increase the number of research users and undergraduate students. Facilities are being renovated as funds become available, and our Major Resource Support grant from NSERC was renewed with an increase.

6. Briefly describe your Centre membership and organization structure, as a separate document, attach a full membership list.

President, Barry McBride,	Provost emeritus, UBC
Treasurer, Gayle Gorrill,	VP Finance, UVic
Director, Brad Anholt,	UVic
Academic Committee	
Felix Breden,	Chair, Biosciences, SFU
Kathy Gillis	Associate Dean of Science, UVic
Bob Shadwick	Zoology, UBC
Mike Caldwell	Chair, Biosciences, UofA
George Bourne	Associate Dean of Science, UCalgary
Finance Committee	
Martin Pochurko	Associate VP Finance, SFU
Rob Lipson	Dean of Science, UVic
Simon Peacock	Dean of Science, UBC
Greg Taylor	Dean of Science, UofA
Ken Barker	Dean of Science, Uof Calgary

7. Provide a summary of financial resources attracted and used, both from the **University** and **external sources.** (Attached a separate document, if necessary.)

Period	Source	Purpose	Total Budget
2010-11	NSERC	Major Resource Support	$ 349,000
	NSERC	PromoScience	$ 30,000
	Telus	Curriculum development	$ 24,524
	Private	Collections database	$ 20,000
	Endowments	Scholarship and grants	$ 65,869
	Canada Jobs	Salary support	$ 12,000
	SFU	Operations and Minor Capital	$ 258,400
	Other Unis	Operations and Minor Capital	$1033,600
	Invoices	Food and Housing	$ 933,065
	Scientific Services		$ 920,678
2090-10	NSERC	Major Resource Support	$ 349,000
	NSERC	PromoScience	$ 30,000
	Endowments	Scholarship and grants	$ 17,024
	Canada Jobs	Salary support	$ 12,000
	SFU	Operations and Minor Capital	$ 296,400
	Other Unis	Operations and Minor Capital	$1,185,600
	Invoices	Food and Housing	$ 894,875
		Scientific Services	$ 721,779
2008-09	NSERC	Major Resource Support	$ 349,000
	NSERC	PromoScience	$ 30,000
	Endowments	Scholarship and grants	$ 79,967
	Canada Jobs	Salary support	$ 12,000
	SFU	Operations and Minor Capital	$ 308,400
	Other Unis	Operations and Minor Capital	$1,233,600
	Invoices	Food and Housing	$ 925,775
		Scientific Services	$ 767,924

8. Please identify the university resources, if any, provided to your Centre.

Space: None

University Personnel: Teaching provided by Biological Sciences faculty

Major Equipment: BMSC received surplus computer servers from SFU

9. How has your Centre enhanced research over and above what would have been accomplished by an individual faculty member?

Working in the marine realm requires specialized research and safety equipment. By collecting researchers in a single location, these costs can be shared and resources fully used.
Bringing researchers together naturally leads to collaborations. At BMSC these collaborations are often across disciplines and almost always among researchers from different universities, often different countries.
Undergraduates become engaged in research from the beginning. Course projects are often supervised by researchers on site. The majority of students in the fall program go on to graduate school.
The forty year research history at BMSC provides invaluable background information for researchers.

10. Provide a rationale for the continuation of your Centre.

The NSERC MRS grant was renewed for 3 years with an increase of 15%. The review summary is an excellent précis of the justification.

A

Natural Sciences and Engineering Research Council of Canada

Conseil de recherches en sciences naturelles et en génie du Canada

APR 2 6 2011

MESSAGE TO APPLICANT

This message represents the consensus opinion of the selection committee that reviewed your application

MESSAGE AU CANDIDAT

Ce message reflète le consensus de l'opinion du comité de sélection qui a examiné votre demande

Family Name, Initials and University of Applicant
Nom de famille, initiales et université du candidat

Anderson, Bradley Victoria

Type of Grant: Genre de subvention

Major Resources Support / Appui aux ressources majeures

Committee: Comité

Major Resources Support (1051) / Appui aux Ressources Majeures (1051)

1. **Uniqueness of the resource:** The centre is unique in Canada as the only one on the Pacific coast with its unique biota and coastal conditions; it has ready access to open ocean versus Friday Harbor further south. It has excellent teaching and research facilities, including the new Fluid Dynamics Laboratory, the Rix Centre for Ocean Discovery, and a remotely operated vehicle

2. **Use of the resource by the research community:** There is a steadily growing use in recent years with more than 40 research groups and over 80 HQP making use of the facilities every year from across Canada and 11 other countries. The facility provides support to NEPTUNE Canada for maintenance of the Folger node and logistical support for other projects. The laboratories and housing are well used.

3. **Need for access to the resource for the research programs:** There is a diverse group of users of the Bamfield Marine Sciences Centre (BMSC) including universities and government scientists from Parks Canada, Environment Canada, Canadian Museum of Nature, Fisheries and Oceans and Geological Services of Canada. These groups represent a wide array of research interests.

4. **Merit of the research programs that rely on access to the resource and excellence of the user community:** As noted by one of the reviewers, among the co-applicants are five Royal Society Fellows, six Canada Research Chairs and two Steacie Fellow recipients, and many others with strong programs. Many co-applicants and users are leaders in their respective fields of research. There is a good array of other funding and publications. The co-applicants will invest a significant fraction of their time in the station. Their outreach programs are commendable.

5. **Demonstrated need for support through an MRS grant:** The demonstrated need is high and diverse. As noted by one of the reviewers, they have done a credible job in

Personal Information Bank Numbers: SERP-PU-005 and 011
Nos de fichiers de renseignements personnels: RSG-PU-005 et 011

Canada

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PROTÉGÉ UNE FOIS REMPLI

5

securing funds from other sources including member universities. Most Canadian users are supported by NSERC discovery grants and any reduction in MRS funding would put a burden on these and reduce their potential outcomes. The request for a database specialist is justified, but research coordinator assistants could be supported otherwise.

6. **Management of the resource:** The management structure seems to be well in place. The Director is appointed for five years and was praised by the reviewers. The Finance Committee approves the budget and the Academic Committee approves policies that affect research and teaching. The management is also composed of a Users Group and Scientific Advisory Board and is considered appropriate.

7. **Contribution of the resource to the training of highly qualified personnel:** The BMSC is ideal for the training of highly qualified personnel, including students, postdoctoral fellowships (PDFs) and technicians with interactions of various users. This aspect is also enhanced by $30,000 of scholarships to use the Centre plus support for teaching assistants. In 2008-10, they trained 93 graduate students, 30 PDFs and 47 undergraduate assistants.

8. **Synergy:** BMSC enhances new collaborative efforts across Canada and with international users and gave plenty of examples. The communal equipment, data platform for research into global change and assistance of support staff enhance multidisciplinary work and synergy.

Overall, this application was deemed to be very strong. The Committee recommended funding at $400,000 per year for the next three years.

11. List your Centre's goals for the next five years.

BMSC is in the midst of a strategic planning exercise. The draft plan emphasizes:

- Data platform --- establish monitoring of ocean conditions in Barkley sound and make this available to researchers online. Capture historical data sets and make these available for research on global change
- Increased numbers of long-term (repeat) researchers --- the data platforms are intended to attract researchers. Enhanced facilities and access are key.
- Increased numbers of university program students --- cost remains a significant impediment. Enhanced scholarships are one option. Broadening the diversity of courses will expand the available pool of students
- A vibrant Public Education Program that is financially sustainable --- PEP engages over thousands of visitors every year. This enhances BMSC's profile, it fulfills an important outreach role, and helps attract students to the university program. The program keeps the facility open when it would otherwise close due to lack of use. This keeps staff employed so we maintain continuity, and the facility is available to researchers and university field

trips almost year round. Many marine facilities are only open six months or less each year.

- Improved transportation --- Simplifying access and reducing costs can be achieved by BMSC acquiring and running our own bus. This requires a detailed business plan. However, groups could be met at the airport or ferry and taken directly to BMSC. The non-monetary advantages include a bus equipped to handle the road (suspension, tires, radio), a driver familiar with the road, BMSC control over arrival and departure times, and predictable dates for researchers to schedule arrivals and departures. We believe this service can be run at a modest profit while providing clients with a cheaper and more reliable service.
- Improved profile and image --- BMSC is not well known even at the member universities. We need to work harder at being known by upper and middle administration so that we are considered when opportunities or initiatives arise. We need to continue to improve our "brand awareness" around the world to remain competitive at NSERC, to attract new researchers, to establish additional sources of grant funding, and to grow our endowments.

12. Describe other changes planned upon renewal (e.g. membership, organization structure, etc.).

A scientific advisory board will be constituted to provide guidance in the design and placement of a sensor array.

13. Provide an updated calendar description if different from the old listing on the first page.

No change

14. Outlook for the future and other comments, by the Director of the Centre:

Staff renewal has created an optimistic culture at BMSC. In 2010-11 we ran a budget surplus for the first time. This allows us to reduce assessments to member universities complete minor capital projects repairing aging facilities, and enhance research opportunities. The renewed NSERC MRS grant with an increase bodes well for the future. Researcher numbers continue to increase; we draw from across Canada and around the world.

Signature of the Director of the Centre/Institute

_____ Date:_____

Director

7

Faculty Dean – Centres Only

a. Comment on the Centre's performance:

b. Comment on future Faculty support for the Centre (financial, teaching release, space, etc.):

c. Recommendation:

Signature of the Faculty Dean or Vice-President, Research

_____ Date:_____

Vice-President Research - Institutes Only

a. Comment on the Centre's performance: WCHRI has a long history of inter-university leading of research at Banfield. The recent years have been somewhat challenging, but the new strategic plan currently developed will reinforce the Centre.

b. Comment on future University support for the Centre (financial, teaching release, space, etc.): Annual financial support and in-kind support will continue.

c. Recommendation for renewal:

Renew.

Signature of the Vice-President, Research

Date: 11/21/2011

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