

Annual Progress Report

Date submitted (dd/mm/yyyy): 20/09/2013

Project no.: 30198

Institution: University of Western Ontario

Title of the Major Science Initiative (MSI): Compute Canada / Calcul Canada

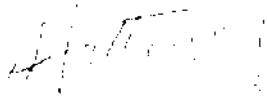
Signatures:

By signing below, you acknowledge having received and read a copy of this report and further certify that all information incorporated in the document is true, accurate, and complete, and that MSI Board members have seen and approved the report.

Chair of the MSI Board

Name: Donald Hathaway

Signature:

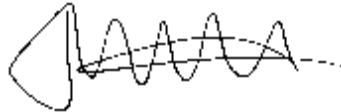


Date: September 20, 2013

President or authorized signatory of MSI lead institution

Name: Jill Kowalchuk

Signature:



Date: September 20, 2013

NSERC/MRS principal investigator, where applicable

Name: David Sénéchal

Signature:



Date: September 20, 2013

Part 1 – Performance report

1. Summary of performance indicators for the MSI

Standard indicator	Target for 2012	Value of indicator for 2012	Target for 2013
Number of Users (1)	1,200	1,452	1,500
Number of HQP (2)	4,000	3,408	3,850
Number of scientific contributions (e.g., journal publications, conference proceedings, etc.) linked to the use of the MSI. See Appendix A	1,500	1,411	1,550
Number of technical contributions (e.g., patents filed, spin offs, etc.), where applicable, linked to the use of the MSI. See Appendix B	500	943	950
Level of use (of all compute systems in Compute Canada)	75%	81.76%	80%
User satisfaction (based on a 5 point scale with 5 being very satisfied) (3)	3.5	4.13	4
MSI specific indicators	Target for 2012	Value of indicator for 2012	Target for 2013
Up time of compute systems (4)	98%	98.45%	98%
Number of HQP who completed training (graduated in the specified time period) (5)	500	467	500
Number of people trained/reached through training or outreach activities. See Appendix C	3,000	4,802	5,400
% of overall FTE time spent on non-technical or non-scientific activities (6)	10%	7.1%	10%

- (1) Users includes all individuals using the facility who are faculty members.
- (2) HQP includes students, post-doctoral fellows, technicians, research associates, professionals (as defined in the report question)
- (3) As reported by all individuals who responded to the survey. Going forward this will be integrated directly into the Compute Canada renewal system allowing for a broader sampling of individuals.
- (4) Includes all systems managed by Compute Canada.
- (5) Compute Canada started collecting this information in 2012 for all students, PDFs, research associates, etc that were registered in CCDB since 2010. Compute Canada did not request that this only be completed for a given period. As such, the statistic was averaged over a 3 and a half-year period for the purposes of this report.
- (6) This measures the number of individuals and the overall percentage of time spent on non-technical or scientific activities including administration, HR and other responsibilities. This shows that Compute Canada resources are focused on maintaining the infrastructure and supporting the users.

Guiding principles for PIs:

Should include no more than 10-12 indicators (including standard and specific).

Indicators should be:

- “Collectable”
- Measurable (quantitatively or qualitatively)
- Useful/actionable
- Standardizable within the international community --- comparable
- Clearly defined

Selected indicators will cover the key activities of the MSI (operations and research) as well as their outputs & outcomes. This could include:

- Access, for example, number or success rate of access requests
- Capacity and use, for ex. level of use (use delivered vs availability of infrastructure), number & growth in users, user retention, user satisfaction
- Quality/Reliability, for ex. total time lost from unplanned events
- Finance/Sustainability, for example leveraging of funds (through ratios such as CFI or CFI+MRS contribution/total O&M funding; revenues from industry/total funding), cost-recovery ratio, etc.
- Training (could overlap use)
- Research activity/productivity, for ex. number of distinct research projects enabled, number of publications in peer-reviewed journals, number of new partnerships between the MSI and outside organizations, number of direct participation by MSI or its employees in formal collaborations/networks/consortia at the national and international level, number of projects with public or private sector participants, number of international faculty and students involved in MSI projects (speaks to international reputation?)...
- Outcomes: number of patents, number of jobs created

MSIs will be allowed to discuss if they wish to do so any issues raised by the measure(s) including deviation from expected performance contingencies and corrective actions.

- i. Please provide information regarding the distribution of Users* of the MSI during the period extending from April 1, 2012 to March 31, 2013 and compare it to that of the previous year including the proportion of new users. Disaggregated data should allow assessing the use of the facility among researchers:
- within and outside of Canada,
 - from within and outside the MSI,
 - from different sectors (academic and non-academic organizations),
 - and from various disciplines.

** Students, post-doctoral fellows, technical and professional personnel should not be included in this section.*

		Number of Users (Faculty)			Usage: Core Years (000s)		
		2012	2013	# new users	2012	2013	% increase in usage
within Canada		1225	1451	226	32,829	49,535	51%
outside Canada (1)		0	0	0	0	0	0%
within the MSI (2)		1017	1210	193	26,446	29,753	50%
outside the MSI		208	241	33	6,383	9,782	53%
Sectors	University	1163	1373	210	27,402	42,233	54%
	College	34	44	10	734	1,046	35%
	Private Industry	0	0	0	0	0	0%
	Government Agency/Lab	7	8	1	220	1,410	541%
	Not-for-profit	4	4	0	287	222	-22%
	Hospital	17	22	5	4,416	4,634	12%
Disciplines	Astronomy	37	45	8	1,989	2,111	6%
	Biological and Life Sciences	144	177	33	2,014	3,950	96%
	Business	7	10	3	24	101	323%
	Chemistry and Biochemistry	196	229	33	11,296	17,216	52%
	Computer and Information Science	116	124	8	1,092	2,183	100%
	Engineering	264	316	52	5,207	7,822	50%
	Environmental and Earth Science	101	106	5	1,821	2,990	64%
	Humanities	2	3	1	0.083	0.049	-41%
	Mathematics and Statistics	91	97	6	721	981	36%
	Medical Science	43	66	23	753	1,077	43%
	Physics	194	236	42	7,833	11,005	40%
	Psychology	12	16	4	34	44	31%
	Social Science	18	26	8	46	55	20%

(1) Compute Canada policy only supports international users if supported by a Principal Investigator (PI) that is a Faculty Member of a Canadian institution. The number of users and associated compute system usage is tracked by PI for the entire group. Compute Canada systems are used by international users, but this is not shown in this group.

(2) "Witin the MSI" is defined as users (faculty members) whose primary affiliation is with a university that is a Member of Compute Canada. In 2012-13 Compute Canada had 28 Members including: Concorida

University, Dalhousie University, McGill University, McMaster University, Memorial University of Newfoundland, Queen's University, Saint Mary's University, Simon Fraser University, St. Francis Xavier University, Université de Montréal, Université de Sherbrooke, Université du Québec à Montréal, Université du Québec à Trois-Rivières, Université Laval, University of Alberta, University of British Columbia, University of Calgary, University of Guelph, University of Manitoba, University of New Brunswick, University of Regina, University of Saskatchewan, University of Toronto, University of Victoria, University of Waterloo, Western University, Wilfrid Laurier University and York University.

Classification of users in the above categories is dependent upon how researchers classify themselves in the central Compute Canada Database Portal (CCDB). Before 2012 researchers were only eligible to hold a "Principal Investigator" account (in which they could approve other students, PDFs, external collaborators and researchers working under them) if they were a faculty member at a CFI or Tri-council eligible institution. As such, researchers who would normally deem their primary affiliation to be a hospital or research institute are classified within a University because they listed their adjunct position in CCDB to get access to the resources. This policy has since been changed, and we are working to ensure that individuals are classified by their most appropriate primary affiliation. This update will be reflected in future statistics.

The change in policy also explains the significant increase in usage of the systems by PIs from government labs. Some researchers have been reclassified as their primary affiliation is from a government lab. In addition, more researchers from government labs have started to take advantage of the resources in their research projects.

Similar challenges existing in classifying users in a specific discipline. The disciplines noted above were used from the NSERC categorization for historical reasons.

The majority of the usage of Compute Canada systems is from within the traditional fields of Chemistry, Biochemistry and Physics. However, we are seeing a significant increase in usage by individuals in "non-traditional" disciplines such as Business and Life Sciences. There is also a significant increase in Engineering and Computer Science, which is attributed to a number of these researchers utilizing the Compute Canada infrastructure while working with collaborators in non-traditional disciplines.

Please compare the current level of use by HQP to that of the previous year including the proportion of new HQP? If possible, disaggregated the data by category of HQP as follows:

- Students
- Post-doctoral fellows
- Technical and professional personnel

	Number of Users			Usage: Core Years (000's)	
	2012	2013	# new	2012	2013
Students	1763	2406	643	14,409	23,725
Post-doctoral fellows	419	519	100	7,375	9,612
Technical & Professional Personnel	282	336	54	n/a	n/a

ii. Please describe any national or international recognition the MSI has gained during the period extending from April 1, 2012 to March 31, 2013.

During the period of April 1, 2012 to March 31, 2013, an emphasis was placed on reinforcing national recognition and engagement within Canada’s research and innovation-driven communities. This was done to lay the groundwork for Compute Canada to develop a more comprehensive, long-term campaign, once its full senior leadership team is in place, that will further expand and strengthen Compute Canada’s visibility and recognition as a national and international leader in the delivery and support of advanced computing for research.

Compute Canada’s greatest national recognition comes from its annual conference, the High Performance Computing Symposium, Canada’s foremost supercomputing conference. In May last year, HPCS 2012 was hosted alongside BCNET’s annual network conference in Vancouver, BC and attracted one of its largest audiences to date from across North America. Xyratex, a Compute Canada industry partner and conference sponsor, was blogging live from the event and posted: “The three day Symposium looks to be an exciting one with close to 500 high profile delegates from various disciplines within the research and HPC communities.” Following the event, the attendee evaluation forms indicated nearly 30% of respondents felt the event exceeded their expectations. Similarly, one delegate left this comment regarding HPCS’s Day Three Keynote speaker, John Towns, Principal Investigator of the National Science Foundation’s Extreme Science and Engineering Discovery Environment (XSEDE) project: “It was the best presentation and most informative about how the CyberInfrastructure and HPC have changed over the past decades.” Shortly after participating in the HPCS event, John Towns accepted an invitation to join the Compute Canada’s Board of Directors, which was a significant and positive step forward in building a collaborative relationship between Canada and the United States’ national HPC organizations.

Compute Canada's annual allocation of advanced computing resources has also attracted both national and international recognition. HPCwire, an international online source for HPC news, analysis and information, published a full-page story on Compute Canada's 2012 allocation of nearly \$72 million worth of state-of-the-art computing, storage, and support resources to 212 leading edge Canadian research projects across the country ([http://www.hpcwire.com/hpcwire/2013-01-21/compute-canada-awards-\\$72-million-for-research-projects.html](http://www.hpcwire.com/hpcwire/2013-01-21/compute-canada-awards-$72-million-for-research-projects.html)).

Major research discoveries and science breakthroughs regularly contribute towards the national recognition of Compute Canada's distributed platform of resources. They also demonstrate the important role the Regional Divisions play as the front-line representatives of Compute Canada through their local support teams and operation of regional computing facilities. For example, last year's confirmed discovery of a Higgs boson-like particle in July 2012 gained significant national and international media attention. Canadian researchers played a key role in the milestone discovery through their use of various regional Compute Canada facilities. Mainstream and university media outlets across the country published a number of stories highlighting ATLAS-Canada researchers' use of regional national platform sites, such as those provided by Calcul Quebec (<http://publications.mcgill.ca/reporter/2012/07/mcgill-physicists-contribute-to-sighting-of-what-could-be-the-elusive-higgs-boson/>), SciNet (http://www.thestar.com/news/world/2012/07/03/higgs_boson_university_of_toronto_plays_key_role_in_god_particle_discovery_expected_to_be_announced_wednesday.html), and WestGrid (<http://www.sfu.ca/sfunews/stories/2012/sfus-role-in-the-atlas-experiment.html>).

Other Compute Canada-supported discoveries which received national recognition last year included examples such as Ryerson University's Seth Dworkin who is using SciNet facilities to develop greener and cleaner engine technology (<http://theeyeopener.com/2013/04/supercomputing-to-save-the-planet/>), and researchers Alan Wagner and Humaira Kamal who used WestGrid clusters to execute over 100 Million MPI processes to scale basic MPI middleware for massively parallel programming, a groundbreaking milestone in the exploration of exascale computing (and an announcement which was picked up and shared by the Argonne National Lab - <http://www.mpich.org/2013/01/15/over-100-million-processes-with-mpich/>)

In March 2012, Backbone Magazine, one of Canada's largest and most successful business magazines, ran a special edition to recognize the organizations, people, events and products that stand out and contribute to Canada's competitiveness and economic strengths. As part of this showcase, one of Compute Canada's regional division facilities (HPCVL) was selected as one of the "Best 10 Research Facilities" in Canada. (<http://www.backbonemag.com/Magazine/2013-03/backbone200-best-canadian-tech.aspx>). Also, three major Canadian research organizations (the Canadian Light Source, SNOLAB, and TRIUMF) -- who heavily rely on access to Compute Canada resources to conduct their world-class research -- were also included in the list. This highlighted not only Compute Canada's value as a national resource provider, but also how a number of

Canada's major research investigation and international collaborations are dependent on access to Compute Canada's leading edge advanced computing resources.

The value of Compute Canada's advanced computing resources received provincial government recognition in Quebec as part of a discussion paper produced by the Ministry of Higher Education, Research, Science and Technology from a national conference on research and innovation held in Quebec April 2013. Titled, *Assises nationales de la recherche et de l'innovation*, the piece referenced the importance of Calcul Québec in the following quote: "The creation of major infrastructure and research platforms, such as Génome Québec and Calcul Québec, allows the development of cutting-edge research in domains that are key for Quebec."

(http://www.mesrst.gouv.qc.ca/fileadmin/administration/librairies/documents/RST/Assises/assises_cahier_participant.pdf)

In addition to the above examples, a number of Compute Canada collaborations and activities beyond Canadian borders served to specifically build the organization's international recognition. For example, in June 2012, Compute Canada was invited to participate in the International SuperComputing (ISC) Conference in Germany. Booth space alongside 175 of the world's leading HPC vendors and research organizations was provided free of charge as the ISC wanted Compute Canada to promote its Canadian HPC activities to ISC's 2,000 international delegates. The event was very successful for the Compute Canada contingent, who gained greater insights into a number of up-and-coming HPC projects, technologies and trends. In addition to ISC, Compute Canada also participated in more than a dozen high-profile international conferences, workshops and symposia (see page 12 for a complete list). Further exploration into international partnerships and collaboration opportunities will receive greater emphasis in the coming years.

Past year achievements (activities, successes and challenges) during the period extending from April 1, 2012 to March 31, 2013.

A. Governance and strategy

With reference to the Strategic and Management Plans, please provide an update relative to specific objectives and targets last approved by the MSI Board:

- A1.** Based on the MSI's performance during the period extending from April 1, 2012 to March 31, 2013, please list the key strategic objectives and targets that were approved and indicate if they were met. If an objective or target was not met or only partially met, the report should discuss the challenges faced and note any corrective actions taken or planned.

Strategic Objective #1:

Objective: *Form an advisory committee on governance and management to review Compute Canada and provide a strategic report with recommendations for strategically moving Compute Canada forward from a governance and management perspective.*

Status: Objective met.

Details: Compute Canada created an expert Committee on Governance and Management which met in June 2012. This committee included national and international representatives from industry and academia. The committee delivered a report that contained key recommendations for developing an effective governance and management model for Compute Canada. This report was circulated to the Compute Canada stakeholder community to solicit feedback on the recommendations. Compute Canada also asked for specific feedback from the existing committees and partner institutions. Moving forward the Vice-Presidents (Research), which were operating as an Advisory Board in 2012, pushed forward the incorporation of Compute Canada and the nomination of the inaugural Board of Directors.

Strategic Objective #2:

Objective: *Incorporate Compute Canada as a not-for-profit corporation with an independent Board of Directors.*

Status: Objective Met.

Details: Compute Canada was incorporated on September 27, 2012 under the Canada Not-for-profit Corporations Act. The VP(R)s defined the eligible membership of the organization as universities and colleges which are CFI eligible and have one or more researchers who have used CC infrastructure in the past 18 months. Compute Canada had 28 inaugural member institutions spanning all regions of Canada. The first special meeting of the Members was held on October 31, 2012 by videoconference at 28 locations across Canada. The inaugural Compute Canada Members Meeting elected the first Board of 10 Directors with an 11th Director added by the Board at the first Board meeting, held November 19, 2012. The list of the Inaugural Compute Canada Board Directors is included in Appendix D.

Strategic Objective #3:

Objective: *Hire senior staff - Chief Executive Officer (CEO), Chief Technology Officer (CTO) and Chief Science Officer (CSO).*

Status: **Partially Met – activities ongoing.**

Details: The Advisory Board of VP(R) started a hiring process in August of 2012. Odgers Berndtson was contracted to handle the recruiting process for the three senior positions: the Chief Executive Officer (CEO), Chief Science Officer (CSO) and Chief Technology Officer (CTO). The VP(R) Board started the process for the CEO selection and created a CEO selection committee. 112 individuals applied for the position; 6 candidates were short listed and interviewed by the search committee. A candidate for the CEO position was recommended to the Board in December 2012 and William Appelbe was offered the job. Appelbe started in January 2013 as a contractor. In April 2013, the Board decided that Appelbe did not fulfill the competency profile required by the mandate and mission of Compute Canada. At that point he had not yet agreed to the contract on offer. Subsequently an Interim President was seconded from Cybera to provide leadership until a new CEO can be put in place. The advertising and short listing for the CTO and CSO positions was started during the period of this report, but suitable candidates had not been selected by March 31, 2013.

Strategic Objective #4:

Objective: *Complete and implement a cost-benefit analysis.*

Status: **Partially met – activity ongoing.**

Details: Compute Canada commissioned a Cost-Benefit Analysis from Hickling Arthurs Low (HAL) with a report submitted to CFI in May 2012. The report contained incorrect assumptions, incomplete and, in some cases, inaccurate data. Compute Canada then decided to develop a cost benefit analysis under the direction of the Executive Director, with the support of Jim Cranston, a consultant who had completed similar work in British Columbia, and a number of key technical people in the regions. This report was delivered to the Compute Canada Board in January 2013. It has been the basis for the Special Committee on Strategy and Planning to undertake extensive consideration of many factors affecting the optimization of the CC facilities and resources. This activity is ongoing and a plan is expected to be complete in early 2014.

- A2.** If applicable, please describe any major actions taken to enhance or improve the governance of the MSI during the period extending from April 1, 2012 to March 31, 2013. These changes may result from a review of plans, priorities and procedures, unforeseen events, or the adoption of best practices.

The most significant activity undertaken by Compute Canada during the period was the creation of the not-for-profit corporation and the independent Board of Directors. These changes are outlined above and were the result of the adoption of the best practices recommended by the Advisory Committee on Governance and Management. Since the Inaugural Board has been put in place three standing committees of the Board have been created to ensure the effective governance of the organization. Charters have been approved for the Board as a whole and for each standing committee.

The Audit and Disclosure Committee (ADC) has had oversight of the budgetary process, it has selected a Public Auditor and it has implemented the policies and internal financial controls to ensure financial accountability and reporting.

The Governance and Nominations Committee (GNC) has reviewed membership eligibility as defined by the by-laws, it has developed the succession process for Directors and it has taken a lead role in selecting a research council to advise the Board. At the Annual General meeting in October 2013, the Compute Canada Board will recommend that the by-laws be amended to allow research hospitals with one or more researchers who have used a Compute Canada resource in the past 18 months to be eligible for membership in the corporation.

The Management Resources and Compensation Committee (MRC) is responsible for selecting executive-level resources and overseeing their performance.

The Board formed a Special Committee on Strategy and Planning (SPSC) at its January 2013 meeting and this sub-committee, in addition to the deliberations noted in Strategic Objective #4, has operated as an executive committee, often meeting weekly by teleconference and spending many hours resolving the various issues that face every emerging organization.

B. Management

- B1.** If applicable, please describe any major actions taken to enhance or improve the management of the MSI during the period extending from April 1, 2012 to March 31, 2013. These changes may result from a review of plans, priorities and procedures, unforeseen events, or the adoption of best practices.

In April 2012, Compute Canada hired an Interim Executive Director. The Executive Director had the responsibility of supporting the VP(R) Advisory Board in meeting the CFI objectives for funding, while ensuring the Compute Canada network of resources continued operation during the period. Resources both within the regional partners and through contractors employed at Cybera supported the Executive Director. Once Compute Canada was incorporated the Executive Director was given the authority to manage the organization until a CEO was put in place.

To ensure the effective management of the organization, based on the recommendation from the expert governance and management advisory committee, the previous Compute Canada committees were dissolved. Compute Canada created a committee of the regional directors to assist with that the flow of information between the institutions, regions and the national organization.

A significant piece of work during the period was to evaluate and develop solutions for the LEF/NIF/LOF proposals approved by CFI with conditions related to Compute Canada. Compute Canada developed a process for consulting with the researchers and institutions which received these awards. This process improved the management of the MSI.

Throughout the period the process was tested and has been refined with the goal of developing the most effective process for removing the conditions in a timely manner.

C. Users access and training of HQP

- C1.** Please outline the activities undertaken by the MSI during the period extending from April 1, 2012 to March 31, 2013 to increase the awareness of the potential user communities of the activities and opportunities offered by the MSI.

During the period for this report Compute Canada led activities to increase the awareness of the opportunities that Compute Canada can provide to potential user communities. These activities included meetings with the administration at partner institutions and direct discussions with researchers, mostly through the November 2012 LEF/NIF and LOF call for proposals. Meetings with the Research Services offices at more than 25 institutions across Canada promoted Compute Canada services to current and potential research communities. In addition Compute Canada was able to communicate how researchers and institutions can leverage the organization's expertise in housing, managing and acquiring advanced computing infrastructure.

Compute Canada held its annual conference (HPCS 2012) in Vancouver, BC in collaboration with the BCNet annual conference. The co-location enabled exposure with individuals who could potentially use the CC network of resources and/or who would promote its services to other researchers with whom they interact. The BCNet/HPCS 2012 conference had more than 500 attendees from across Canada.

Compute Canada held a total of 29 outreach activities across Canada reaching 1,175 participants (see Appendix C for full listing) in addition to the 500 people who attended HPCS 2012.

Major outreach activities with national or international scope were planned on a national level, and Compute Canada resources allocated based on the likely outcomes in reaching Canadian researchers across disciplines. Therefore HPCS 2012/BCNET was the focus of a substantial national effort and resources during this period, whereas the outreach efforts associated with attending SC 12 were more modest and those for ISC 12 more modest still.

Local outreach opportunities, which ranged from meeting with new faculty hires, through offering departmental or larger training sessions and attending local discipline-specific workshops, were identified by local Compute Canada staff. These were then matched to expertise - typically local technical expertise due in part to funding uncertainty at this time. Events, which had committed resources were supported to take advantage of the opportunity. The largest example is the Summer School run at the University of Sherbrooke in the summer.

The upcoming national Researcher Needs survey will identify national priority areas for outreach; this, coupled with the recently completed HQP survey of technical staff and resulting expertise asset map, will enable more systematically taking advantage of relevant

opportunities. Outreach opportunities that can easily be acted upon by purely local resources will continue to be performed; but outreach opportunities that require national resources to be deployed, such as experts from another region to perform travel, can then be coordinated at a national level.

C2. If applicable, please describe any changes that have been made during the period extending from April 1, 2012 to March 31, 2013 to the MSI's mechanism for user access and/or to the user fee policy towards the various types of users (e.g., internal or external, academic or non-academic).

There were no significant changes to the mechanism for access to the Compute Canada resources. Users are granted access through the Compute Canada Database Portal (CCDB), which unifies access to the resources nationally. During 2012-13 Compute Canada worked on improvements and enhancements to CCDB and access to the national network of resources.

The most significant change to CCDB was the deployment of the account renewal process. This process requires each registered user (both principal investigator (PI) or sponsored user) to confirm and renew their account. During this process PIs are required to report on results for the given period, thus allowing the collection of such results and reporting to funders.

CCDB was enhanced to improve the national resource allocation process, enabling Compute Canada to improve the user experience by getting access to greater than the default amount of resources for the upcoming year. These enhancements also allowed more effective management of the resource allocation committee process to ensure allocation to the highest quality researchers.

Compute Canada also initiated a process to consolidate usernames across Canada in early 2013. This initiative will allow individuals to use the same username on every Compute Canada system to which he or she has access. Compute Canada will move towards a more streamlined process for granting access to Compute Canada systems.

C3. Please outline any training opportunities provided to students and post-doctoral fellows during the period extending from January 1 to December 31, 2012.

Compute Canada and the regional partners held a total of 133 training activities (see Appendix C for full listing) reaching more than 2,800 participants¹. The training activities included getting access and using Compute Canada resources, introduction to programming and general HPC information. Advanced topics in programming, utilizing specialized hardware resources and seminars about using specific tools were also held. Technical training seminars were delivered to a broad group of users. Some events were

¹ This does not indicate 2,800 unique individuals as some participants could attend one or more events. Unique individuals were not tracked and so those reports are not available.

held by videoconference and broadcast to sites across Canada, others were designed as more interactive hands on sessions designed for a smaller group of participants.

Researchers who are using Compute Canada resources gave presentations at seminars across Canada to provide new and existing researchers ideas on how to use Compute Canada resources in their research. The longest running activity is the Coast-to-Coast seminar, which is held by videoconference and offered at more than 20 locations across Canada. This series highlights a different discipline annually and hosts researchers presenting specific topics at institutions across Canada. Last year a total of 7 coast-to-cost seminars were held drawing a total of 402 attendees.

- C4.** Please describe the activities undertaken by the MSI during the period extending from April 1, 2012 to March 31, 2013 to keep abreast of scientific and technical advances and support the development and training of its staff.

The most significant activity that staff participated in was the annual SuperComputing (SC) held in November of 2012 when Compute Canada sent a total of 31 staff to Salt Lake City, Utah to participate in this international event, the largest on the topic of HPC infrastructure. It draws more than 12,000 participants from academia, industry, non-profit and government organizations. This event allows staff to learn more about how international organizations are effectively supporting and operating similar HPC infrastructure. It also allows Compute Canada technical staff to participate in “whisper suite” talks in which major disclose the technical roadmap of upcoming technologies. This information is the basis for effective planning of future resource acquisition as well as providing advice and expertise to researchers who are acquiring their own HPC infrastructure as contributed infrastructure to the network. Given uncertainty in CFI funding for the MSI at the time of SC’12, each institution or region determined which individuals, if any, would attend the event based on the available funding at that site. Compute Canada covered the cost for the two staff people who were responsible for organizing the booth to ensure Compute Canada’s presence at the event ran smoothly.

In addition to the SC’12 Compute Canada also sent staff to a number of national and international events to gain expertise on operating technical resources effectively, training to support researchers and opportunities for expansion of the use of the resources by non-traditional disciplines. The complete listing of events Compute Canada participated in include:

- *SC12, the International Conference for HPC, Networking, Storage and Analysis in Salt Lake city;*
- *ISC12, International Supercomputing, in Hamburg, Germany;*
- *HPCS 2012, Vancouver;*
- *Developments in Heterogeneous Computing Technologies, Toronto;*
- *Moab CON 2012, Park City, Utah;*
- *Canada 3.0 Digital Media Forum, Stratford;*
- *NVIDIA GPU Technology Conference, San Jose, California;*

- *Society for Digital Humanities, Waterloo;*
- *HUF 2012- HPSS User Forum, Paris, France;*
- *SPXXL/Scicomp 2012 Summer Meeting, Toronto;*
- *SPXXL 2013 Winter Meeting, Maui;*
- *San Diego Supercomputing Center Data Mining Boot Camp;*
- *Lustre User Group 2013, San Diego;*
- *OFED User Workshop, Monterey.*

In addition Compute Canada held internal events to ensure the effective dissemination of information and sharing of best practices learned from attending external events. In addition to a face-to-face meeting and sharing of information at HPCS, Compute Canada holds bi-weekly TECC-SC meetings by videoconference. These meetings include the technical leaders from across Canada. National working groups have been created to continue the development of national initiatives and sharing of information. Three examples of such working groups include networking, access to resources, and the collaboration of working groups.

D. Risk Assessment

- D1.** Please describe the results of any risk assessments completed during the period extending from April 1, 2012 to March 31, 2013. If a risk assessment was completed over the past year, please describe any mitigation or monitoring strategies developed as a result to reduce the MSI risk profile.

During the period both the VP(R) Advisory Board and the inaugural Board did an assessment of the risks to the organization and chose appropriate mitigation.

From April to November 2012 the most significant risk to the organization was the uncertainty related to Compute Canada's MSI funding as expressed in the response from CFI on March 26, 2012. Many activities during this period were influenced by this risk as Compute Canada ensured that the organization met the conditions outlined by CFI in the response letter.

Risk: Negative response from CFI regarding the request for funds through MSI program.
Impact: High.

Mitigation Strategies:

- Hired Interim Executive Director, Jill Kowalchuk, to lead the organization during the interim period until funding was confirmed and a CEO could be hired.
- Focused all efforts on meeting the necessary conditions specified by CFI.
- Communicated with the institutions and regional partners that the CC priorities were related to meeting these conditions.
- An Advisory Board Committee was active in the CEO recruiting activity in partnership with Western University (lead institution) until the independent was board was elected. Odgers Berndston was contracted to lead the effort.

- Executive Director and the Independent Chair of the Advisory Board led the creation of the Advisory Committee on Governance and Management.
- A consultant was hired to support the Executive Director in the creation of the Compute Canada report on the cost-benefit analysis. Identifying the key issues the Board would need to consider when looking at consolidating efforts.

Risk: Insufficient matching funding.

Impact: High.

Mitigation Strategies:

- The institutional lead for each province, where appropriate with the regional director, led the discussions with the provinces related to securing matching funds. This allowed the Compute Canada Executive Director to focus on securing the CFI funding while still finding the necessary matching funds.

Risk: Lapse in operation of the infrastructure from giving priority to meeting the CFI conditions.

Impact: High

Mitigation Strategies:

- Worked with the regions and institutional partners to have them lead continued operation of the resources with limited direction and leadership from Compute Canada.
- Focussed on maintaining operations with existing policies and processes to ensure continued effective operation of the network.

Risk: Inability to run the national office due to limited administrative support.

Impact: Medium.

Mitigation Strategies:

- Developed operating agreement between Western University (MSI Lead) and Cybera (not-for-profit corporation in Alberta) to enable the efficient and immediate secondment of the Interim Executive Director as well as providing administrative support of the organization on an interim basis.
- Hired additional administrative support for the organization through WordWrap Associates in Toronto and tasked the incoming CEO with developing the necessary administrative offices.

E. Research and technology transfer

E1. Please provide a brief summary of the main research activities of the MSI during the period extending from April 1, 2012 to March 31, 2013.

Compute Canada is a research-enabling platform, directly powering the research of its 1,451 user groups (including 3,261 HQP). However, the application of advanced computing resources to new research question often represents an applied research problem - if the computational tools to investigate a particular research question already existed or were

easily assembled, then competitors would likely have already addressed the question under consideration.

Creating new computational approaches for a particular research endeavour is an applied research problem requiring a combination of applied mathematics, computer science, and software engineering expertise, as well as expertise in the scientific or scholarly domain under consideration. Compute Canada's staff, individually and in teams assembled for the purpose address these questions in collaboration with user researchers. Such applied research advances are often published in their own right ("A computational method for...") or as part of the early research results generated by the new tool.

Since Compute Canada staff take on such applied research on behalf of - and typically in collaboration with - individual user groups, the desired end result is always some form of technology or IP transfer. To avoid duplication in this report this is categorized as technology/IP transfer activities, and listed under section E4, as efforts which resulted in an easily defined, complete, computational tool which was transferred to an individual user group or community. Those research activities which did not generate a tangible deliverable, or whose most visible deliverable was a published paper, are listed in this section under research activities.

This report provides representative efforts from across the country selected from the many dozens of such activities.

Some of Compute Canada's representative research efforts include:

- Compute Ontario staff Scott Northrup worked with Drs. L. Ivan and H. De Sterk (Waterloo) and Hans De Sterck over the past year modifying a research code for use with magneto-hydrodynamics on a form of grid useful for considering spheres (eg, planets). This work resulted in a novel way of adapting the resolution of such grids so that the computational effort is expended only where it is necessary. In addition, this new method allows more highly-accurate numerical methods, further reducing the computational cost of such approaches and increasing simulation fidelity. Finally, performance at large-scale (both computational and data handling) were significantly improved. The resulting publication was submitted to the prestigious *J. Comp. Phys.*, where it will be published later this year as Lucian Ivan, Hans De Sterck, Scott A. Northrup, Clinton P.T. Groth Multi-dimensional finite-volume scheme for hyperbolic conservation laws on three-dimensional solution-adaptive cubed-sphere grids, 15 December 2013 *Journal of Computational Physics*, v. 255
- A WestGrid Compute Canada analyst worked with Psychology postdoctoral fellow Philippe Rast to move their data-analysis from a desktop to the WestGrid cluster, examining different approaches to do the new large-scale analyses. After this work, Dr Rast stated, "I waited for days to get an answer on my machine but now only a few hours on the nestor cluster, using hundred of cores"

E2. Please describe any new partnerships or key collaborations that the MSI has developed during the period extending from April 1, 2012 to March 31, 2013 with the aim of maintaining and enhancing its research capacity.

The partnerships outlined below were aim to enhance the capacity of Compute Canada to support researchers and the research community.

A significant partnership in the period was with Cybera and CANARIE on the Digital Accelerator for Innovation and Research (DAIR). Cybera and Compute Canada submitted a proposal to the program. As the successful proponents of the program, the only one selected, Compute Canada and Cybera deliver cloud resources for Canadian high-tech entrepreneurs. Compute Canada provided expertise to acquire and deploy the resources at the University of Alberta and the University of Sherbrooke. Compute Canada staff ensure the infrastructure is operational and that the software is effectively managed.

Compute Canada, through the regional node HPCVL, is partnering with the Ontario Brain Institute (OBI) to support the brain research database called Brain-CODE. In this partnership HPCVL is hosting the infrastructure required to run the Brain-CODE database. HPCVL is well positioned with extensive expertise in working with personal health information and meeting the special privacy and security issues related to hosting this type of data.

Compute Canada, through the regional node SHARCNET, partnered with Kitchener-Waterloo Hydro and the University of Waterloo to reduce the energy consumption of SHARCNET systems at the University of Waterloo while maintaining existing computational capabilities, a partnership was formed with Kitchener-Waterloo Hydro to leverage energy-efficiency incentives to decrease power usage. By replacing aging servers with new HP ProLiant servers, the SHARCNET consortium can now deliver up to 20x better performance per server while using 95 percent fewer servers to achieve the same overall cluster performance.

E3. Please outline any other opportunities pursued by the MSI to maintain or enhance its research capacity.

Since it is Compute Canada technical staff who pursue the applied research efforts of the MSI, a key part of maintaining and enhancing its research capability is the continued professional development of its technical staff. The staff took part in many professional development and training activities as included in section C4, e.g. the annual international supercomputing conference and the High Performance Computing Symposium, put on by the Canadian community led by Compute Canada. Such events have a particular focus on training and are particularly important in maintaining and enhancing research capacity..

In addition, Compute Canada began exploring opportunities for supporting medical science researchers who work with personal health information. Managing Personal Health Information (PHI) is a complex legal and technical matter that was only partially addressed by Compute Canada in previous years through HPCVL in Kingston. Making further progress

to support researchers using and storing PHI will be a major activity for Compute Canada in the future. In early 2013, Compute Canada started exploring opportunities to expand the capabilities of the network to support researchers with sets of data with unique privacy and security concerns. It is expected that additional partnerships will be formed in the coming year.

E4. Where applicable, please describe any IP or technology transfer with significant contribution from the MSI during the period extending from April 1, 2012 to March 31, 2013.

Below are some representative IP and technology transfer activities, as defined in section E1, for the reporting period.

- The genomic research community uses many commercial software packages that cannot be modified but performance limitations in some of these software packages often limit the size of problems which can be feasibly studied. Typically the performance of data reading and writing (input and output, or I/O) is limited. A Compute Canada team from Calcul Québec developed a tool called IOBUFF, which intercepts system calls related to I/O operations on files. In small test cases, performance can be ten times faster, greatly increasing what research can be performed. This tool can be used also outside of the genomic community. In the Astrophysics code Phoenix, that computes stellar atmospheres and uses large data sets for atomic and ionic opacities, the measured speed increase was a factor of nine, again without change to the software itself
- A Compute Canada analyst from Calcul Québec helped a group in astrophysics analyzing telescope data to search for gravitational lenses and other exotic objects. They needed to read files in an obscure format before performing spectral analysis. The researchers' software required more than 48 hours to process a single image, and they were limited to using a single compute node at a time, further limiting the size of the image that could be processed. Thus they would not have enough memory or time on a single node to perform the required analysis. The CC analyst rewrote the software to read the data more efficiently and to use multiple nodes. The astrophysicists analysis now runs in about 15 minutes on about 10 nodes, and they are able to analyze many more data files than they initially thought possible.
- A Compute Ontario analyst continued his work on a metaprogramming environment, "HWT 7.1", which speeds the development of massively parallel scientific computation tasks by enabling such features as differential debugging (examining the output from very large scale calculations by noting the differences between two versions of a given piece of software).
- A WestGrid Analyst worked with University of Victoria Forest Biology Master's Student Amber Paulson to develop software to enable a very large number of bio-informatics analyses and identify interesting viral organism in megastigmus

sequences. Ms. Paulson reported: “Depending on the bio-informatic tool I used, the speed can be increased from 5 times faster to incomparably faster than on the desktop”.

Many CC technology transfer projects result in new versions of software which are enormously more powerful, significantly increasing their ability to perform cutting-edge research. These projects typically require both deep understanding of the performance of high-end computing equipment, best practices in modern software development, and research into applied mathematical techniques for improving or replacing algorithms for certain computational tasks. Some examples of this are Compute Canada staff working at Compute Ontario developing and transferring new versions of software that improved the performance of Wilfred Laurier CS professor Dr. Kotsireas’ research software by almost a factor of seven; Carleton electrical engineering professor Dr. Banihashemi’s research software by a factor of 20; Laurentian Physics professor Dr. Virtue’s research software by a factor of 650; and Guelph History professor Dr. Inwood’s data analysis software by a factor of 1000. Changes of this magnitude can completely alter what sort of research is possible to perform.

F. Benefits to Canada

- F1.** Please outline achievements that have led to benefits to society, health, the economy and the environment through the development of new or improved products, processes, services, public policies, and/or sustainable job creation during the period extending from April 1, 2012 to March 31, 2013.

Compute Canada responds to the needs of the research community by delivering the tools and resources to enable Canadian researchers.

For example, at the Université de Sherbrooke, Associate Professor Elijah Van Houten is using Compute Canada resources to support his group’s work in the field of elastography, the imaging of elastic properties in soft tissue. One focus is the elastographic method known as Digital Image Elasto-Tomography (DIET), which is primarily targeted at breast cancer screening, but also has potential applications in detection and diagnosis of musculoskeletal injury and lower back pain. High performance computing is used to reconstruct the elastic property images from the measured data, essentially a large-scale "inverse problem". In 2012, Van Houten used Compute Canada to complete the first clinical trial of the DIET process, successfully detecting and localizing all cancers presented. These highly effective, non-invasive imaging techniques have the potential to revise the treatment of medical conditions that affect thousands of Canadians every year, with significant social and economic impact. Van Houten’s research would not be possible without access to Compute Canada infrastructure due to the highly complex, non-linear methods in his elastographic techniques.

At McGill University, access to powerful computing resources is critical for Hong Guo’s research as he works to establish a new technological computer aided design (TCAD) tool for nanoelectronic device design and materials design. Guo is using computationally intensive modeling tools to investigate important and interesting problems in device

physics, materials physics, and the novel technology of nitride-based artificial photosynthesis. This kind of research has a number of industrial and commercial applications. For example, in 2012, Guo and his colleagues obtained two NSERC SPC grants for developing nanowire artificial photosynthesis and laser technology in collaboration with Hydro-Quebec and Alcoa Canada, a leading producer of primary and fabricated aluminum. In addition to the development of new products, Guo's research also creates sustainable jobs. In addition to his role as a James McGill Professor, Guo is also the President and CEO of NanoAcademic Technologies, a company he founded in Brossard, QC with fellow McGill researchers. NanoAcademic Technologies currently provides employment for six highly qualified personnel and develops state-of-the-art modeling software for industrial, government and academic clients.

Compute Canada resources are also being used to help researchers better understand our environment and manage our ecosystems. For example, Associate Professor Robin Gras at the University of Windsor is using Compute Canada resources to operate EcoSim, a predator-prey evolving ecosystem simulation, unique in that it is the only simulation that models the fact that individual behaviors affect evolution and speciation. The computational demands of this simulation are impressive. In one run of the EcoSim simulation, more than 1 billion agents can be born and several thousands of species can emerge and become extinct. Compute Canada infrastructure is used to run the simulation, store and analyze the data generated. Last year, Gras discovered sets of rules that characterize situations in which a species will become extinct, a new species will emerge, or a variation in species richness will increase in an ecosystem. In addition to academic publication, this work received widespread media coverage in publications such as ACM TechNews, USA Today, the Windsor Star, Metro, Computer Power User, and C-Fax 1070 Radio. Gras' findings have contributed new insights on the effect of human behaviour on ecosystems as well as improved our ability to predict and manage possible species extinction, the probability of a species invasion, and the diffusion of diseases in populations.

Canada's judiciary system is benefiting from a Compute Canada user's research at Simon Fraser University. Anoop Sarkar, an Associate Professor in the School of Computing Science, used Compute Canada resources last year to customize a solution for translating Canadian court judgments between English and French. Sarkar's research group at the Natural Language Lab explores statistical machine translation (SMT) with a particular interest in morphologically complex languages and multi-domain and multi-lingual translation settings. Supported by Compute Canada resources, Sarkar trains his machine translation models using massive amounts of bilingual data, resulting in hundreds of millions of parameters in the models. Next, a decoding process uses the trained models to translate the source language text into the target language. Sarkar's research lab concentrates its efforts in specialized and high-impact domains, such as the judiciary and medical sectors, and works on different language pairs of strategic interest to Canada including Chinese and Arabic with particular emphasis on bridging the need for translation between English and French.

These are a just a few examples of achievements by researchers using Compute Canada resources during the period of April 1, 2012 to March 31, 2013 that led to benefits in the health sector, economy, environment and society.

2. Upcoming year activities for the period extending from April 1, 2013 to March 31, 2014.

A. Governance and strategy

A1. Please list and describe the specific objectives and targets for the period extending from April 1, 2013 to March 31, 2014. Please indicate how these objectives are anticipated to contribute to achieving the MSIs strategic goals.

Objective #1: Development of a rolling five-year strategic and operating plans and budgets – to guide the effective and efficient use of resources in the achievement of the CC mandate

Objective #2: Development of cost-benefit analysis of Compute Canada infrastructure and resources - as the basis for a process and plan to achieve an optimal set of CC data centres

Objective #3: Complete a comprehensive assessment to determine and understand the needs of researchers and the research community – to enable an effective response to future calls for infrastructure needs.

Objective #4: Create an advisory council - to provide advice and guidance on the current and predicted directions of scientific research

Objective #5: Development of relationships with major hospitals - to expand CC's reach into the medical sciences and genomics communities.

Objective #6: Open initial discussions with the humanities and social science disciplines – to develop understanding of the needs for research in these fields

Objective #7: Explore possible synergies with major partners – to achieve greater effectiveness in the deployment of resources.

Objective #8: Hiring full time resources for the CEO, CTO, CSO and financial management positions – to achieve fully operational status under the direction of a senior leadership team

Objective #9: Undertaking the first external audit – to ensure the appropriate use of financial resources and provide the basis for disclosure.

Objective #10: Define and document the relationship between Compute Canada, the regional and institutional partners.

B. Management

B1. If applicable, please describe any major actions that will be taken to enhance or improve the management of the MSI for the period extending from April 1, 2013 to March 31, 2014. These actions may include a review of plans, priorities and procedures or the adoption of best practices.

- Further development of internal financial control and reporting processes to achieve transparency and financial control standards comparable to a public company.
- Development of a set of policies and procedures.
- Development of internal systems to handle human resources and office administration.
- Hiring of administrative and bookkeeping support.
- Determine the most effective office facilities.
- Document and publish the process for managing the removal of awards with conditions related to Compute Canada.
- Define and document the relationship between Compute Canada, the regional and institutional partners.

C. Users access and training of HQP

C1. Please outline the activities that will be undertaken by the MSI for the period extending from April 1, 2013 to March 31, 2014 to increase the awareness of the potential user communities of the activities and opportunities offered by the MSI.

As part of the Strategic Plan, Compute Canada is developing a comprehensive Outreach, Education and Training plan. This plan will provide details on the objectives for the organization related to increasing the awareness of potential user communities. To support this activity, the organization is also developing the services catalogue. This will define the existing services provided by the organization as well as start to outline the future services that will be provided. This services definition will help to guide Compute Canada and partner organizations when discussing what the organization can provide to potential users and user communities.

Compute Canada will develop partnerships with key research hospitals provide an opportunity to increase awareness in the genomics and medical sciences communities.

Compute Canada will develop a relationship with Genome Canada. Through this partnership, we will extend the research communities, which might benefit from our services and expertise.

C2. If applicable, please describe any changes that will be made for the period extending from April 1, 2013 to March 31, 2014 to the MSI's current mechanism for user access and/or to the current user fee policy towards the various types of users (e.g., internal or external, academic or non-academic).

Compute Canada will continue to refine the system and mechanism for getting access the infrastructure with particular attention to achieving single sign-on capability and efficiencies related to the account renewal system.

C3. Please outline any new training opportunities that will be provided to students and post-doctoral fellows for the period extending from April 1, 2013 to March 31, 2014.

The Outreach, Education and Training plan will outline additional tools and training opportunities for students and post-doctoral fellows. In 2013-14 we will continue to run our existing training courses. However, as the plan is developed we hope to start bringing on new opportunities for courses and training materials.

Two specific activities that are being investigated as part of the Outreach, Education and Training plan that would be provided to students and post-docs include:

- Scholars Program: opportunity for students to attend the annual HPCS conference. Providing them with exposure and training to formal training related to the use of advanced computing systems.
- International HPC Summer school: A collaboration with XSEDE (US) and PRACE (Europe) in which students would apply and be selected to attend the week long face-to-face training event led by international experts to be held in Europe in Summer 2014.

These activities are modeled after successful programs run by XSEDE, the equivalent organization to Compute Canada in the US.

C4. Please describe the activities that will be undertaken by the MSI for the period extending from April 1, 2013 to March 31, 2014 to keep abreast of scientific and technical advances and support the development and training of its staff.

In 2013-14 we will be developing a high level plan which will guide the training and professional development of our staff. In this period we will continue to send staff to the key training events for HPC, which includes ISC in Germany, and Supercomputing to be held in Denver in November 2014.

The plan being developed will provide guidelines for regions and institutions to ensure that we are maximizing the learning for our staff in a variety of opportunities. In the plan, we are looking at opportunities for our staff to develop extended expertise into specific research areas, by potentially sending staff to discipline specific events. This would not only provide staff with the opportunity to develop their expertise in a given discipline, but it would also provide the opportunity to promote the services that we could provide to that research community.

We will also hold our annual HPCS event to ensure the effective dissemination of best practices in Canada. This year we will hold birds of a feather sessions to enable staff to bring forward ideas and opportunities for potential collaborations. In 2013-14 we will also hold a technical staff forum. This event will bring together a significant portion of the technical staff to share and collaborate with a focus on technical items. This event will help develop the technical road map and plan that will guide future technical plans.

D. Risk Assessment

D1. If applicable, please describe any risk assessment activities that will be undertaken during the period extending from April 1, 2013 to March 31, 2014.

The Compute Canada Board and Senior Management team are assessing the risks to the organization on an ongoing basis. In the coming period the focus is developing the strategic plan and a comprehensive risk assessment will be a part of that process to be completed during this period. Until this can be completed, CC will continue to assess, evaluate and mitigate risks to the organization using informal methods.

The most substantial risk to the organization in the coming year, similar to the last year, is the risk of not securing the necessary funds to operate the platform. The strategic plan will include strategies to mitigate this risk. The most immediate risk associated with funding is securing the necessary matching funds for the period April 1, 2014 - March 31, 2015.

A strategic priority for the organization is the development of the Senior Management Team. In particular, adding a Chief Technology and Science Officer to support the President. This is important to risk assessment in two ways. First, the lack of resources to fulfill the responsibilities of the National Office is a significant risk for the organization in the coming period. Second, the expansion of the Senior Management Team will allow the organization to more effectively identify and mitigate the risks associated with the organization.

E. Research and technology transfer

E1. Please provide a brief summary of the planned main research activities of the MSI for the period extending from April 1, 2013 to March 31, 2014.

Compute Canada's primary objective is to promote and support the shared use of advanced computing to enable research and innovation for the socio-economic benefit of Canada. Any research activity relates to the support of researchers using the infrastructure, which often results in applied research advances.

Our support team collaborates with researchers from all disciplines tackling requiring a computing network. Compute Canada gives special attention to the researchers requesting and being granted significant computational awards through its annual Resource Allocation Committee (RAC) process. In particular, it ensures that the researchers with large awards are making efficient use of the resources. Researchers who could benefit from one-on-one

support in optimizing their codes are identified through the RAC process and follow up is given to develop the most effective computational solutions.

In 2013-14 Compute Canada will seek to improve the methods for tracking and identifying research support for users. This will allow a more effective knowledge transfer throughout its network of technical expertise. Although knowledge transfer takes place between staff, it has traditionally been done through informal communications. It is important that this informal transfer of knowledge does not stop, but is complemented with a formal communication structure.

A significant research activity for 2013-14 will investigate the needs of the broad research community. This will be done through a number of activities; the largest of which will be a user needs survey. This will be followed up with selected researchers to gather additional information on a one-on-one basis. This research will lead to a roadmap of the resources required by the community when the network is refreshed. This roadmap will support CFI and other funders in the development of future infrastructure calls and prepare Compute Canada to respond effectively to such requests for proposals.

E2. Please outline the main opportunities that will be pursued by the MSI for the period extending from April 1, 2013 to March 31, 2014 to maintain or enhance its research capacity, including the establishment of new partnerships and collaborations.

In the coming year, Compute Canada will expand its ability to research and develop effective solutions to problems in the medical science and genomics disciplines. The partnerships being developed with the genomics centre in Vancouver and the hospitals in Toronto will extend the network of expertise in Compute Canada and allow for additional knowledge transfer.

In addition, Compute Canada extends its research and technology transfer capabilities in data storage and archiving. These areas are growing at an exponential rate, and the need to develop effective solutions to meet the challenges of data storage and curation is critical. This work will extend well beyond Fiscal 2014

E3. Where applicable, please describe any opportunities the MSI will pursue to promote the use of MSI-developed IP / technology for the period extending from April 1, 2013 to March 31, 2014.

In 2013-14 Compute Canada plans will continue to promote the use of the MSI-developed IP/technology through seminars, website dissemination and one-on-one support. As noted in Question E1, formal methods for tracking the IP will be developed in the period, creating a plan related to the education, outreach and training and specifically addressing technology transfer.

A secondary benefit to the User Needs Survey that is planned for 2013-14 will be the identification of users who could benefit from the research solutions developed by the CC support team.

F. Benefits to Canada

- F1.** Please outline any anticipated achievements that will lead to benefits to society, health, the economy and the environment through the development of new or improved products, processes, services, public policies, and/or sustainable job creation for the period extending from April 1, 2013 to March 31, 2014.

Compute Canada's extensive network of computing resources, data storage facilities, research tools and technical expertise supports projects that will feed into a thriving Canadian R&D sector and contribute important socio-economic benefits to Canada.

For example, in July 2013, following millions of hours of data processing time on Compute Canada advanced computing facilities, McGill Professor Alan Evans and his fellow colleagues on the international Big Brain project announced they had completed the world's first high-resolution 3D digital model of the human brain. The whole-brain model is 50 times the resolution, in each of the three spatial dimensions, of previous models, revealing microstructural brain organization at an unprecedented level of detail. The model was created by slicing a 65-year-old human female's donated brain into hair-thin sections, scanning them, and then using corrective software and intensive data processing to refine and correct each digital scan to produce the highest resolution 3D model of the brain to date. It took thousands of hours to assemble more than 7,400 images of individual histological sections, each with its own distortions, rips and tears, into a coherent 3D volume. In one year alone, Compute Canada supported the project with more than 6.2 million compute hours. The Big Brain researchers say they plan to extract measurements of cortical thickness to gain insights into understanding aging and neurodegenerative disorders; create cortical thickness maps to compare data from in vivo imaging; integrate gene expression data from the Allen Brain Institute; and, eventually, to generate a brain model with a spatial resolution of 1 micron to capture details of single cell morphology.

Other researchers are using Compute Canada infrastructure to make breakthroughs in clean technologies that will have significant impacts on the environment. Research has shown that coal combustion to generate electricity accounts for nearly 40% of the world's carbon dioxide (CO₂) emissions. At the University of Ottawa, Professor Tom Woo is using Compute Canada to develop new advanced materials for capturing CO₂ from burning fossil fuels in order to mitigate the greenhouse gas emissions from these energy sources. Woo's lab has developed algorithms to virtually construct hypothetical materials and to simulate the CO₂ capture process in these materials at the atomic level. These simulations are used to screen and identify promising materials that can make post-combustion CO₂ capture a practical reality. To date, Compute Canada resources have been used to screen hundreds of thousands of candidate materials, resulting in several promising materials being identified that are now being synthesized in the labs of collaborators. Woo's use of Compute Canada resources has also enabled a partnership with Inventys of Vancouver, who is currently

building a post-combustion CO2 capture pilot plant at Nova Chemical Corp.'s petrochemical plant in Joffre, AB. Compute Canada resources will be used to virtually screen new materials that will be specifically tailored to Inventys' VeloxoTherm technology process, to optimize its energy efficiency, thereby making it an even more cost-effective means of capturing CO2. Inventys' CO2 capture plant installation is expected to be complete in early 2014.

At Laval University, Professor Guy Dumas' research at the Laboratoire de Mécanique des Fluides Numérique (LMFN) is focused on the hydrodynamic analysis and optimization of different types of turbines for green, renewable energy production. New concepts are proposed and tested, and existing ones are improved through extensive parametric studies using state-of-the-art computational fluid dynamics techniques to simulate the complex, unsteady turbulent flows involved. Compute Canada infrastructure is used to run large 3D simulations of different configurations and various operating conditions over many cycles of the turbine in order to get reliable data on its energy extraction efficiency. Access to Compute Canada resources has enabled Dumas' research group to refine their simulations and expand their product's application into emerging sectors such as tidal energy and in-stream hydrokinetic energy. Last year, Dumas used Compute Canada facilities to develop a second-generation concept of a more robust and scalable oscillating-wings turbine (HAO). This is scheduled to be prototype-tested by the end of 2013. Research such as this pairs environmental benefit with innovative commercialization opportunities and sustainable job creation through new market and product developments.

These are a just a few examples of the research projects using Compute Canada resources that will lead to benefits in the health sector, environment, society and economy during the period of April 1, 2013 to March 31, 2014.

3. Provide an update on the strategic plan, management plan and decommissioning plan (only if changes were made in the past year and if it has not already been addressed in the above sections)

This question has been addressed by previous answers. Given that strategic and to a large extent operating plans are major activities in Fiscal 2013/14, more specific answers will not be feasible until the next report.

Part 2 – Financial report

1. Please complete the financial report templates provided. Any departure from the budget items that were presented in the updated operations and maintenance budget must be explained.

The first money was released for the period April 1, 2012 to September 30, 2013. CC is currently developing the updated budgets for the subsequent 18 month period, October 1, 2013 to March 31, 2015. The attached financial award shows the actual expenses for the period April 1, 2012 to March 31, 2013 and the forecast for the subsequent year. Given the unique 18 month situation for the flow of the first money from CFI, the second year budget in the attached financials is based on an updated budget for April 1, 2013 to September 30, 2013 multiplied by two to represent the entire year. Compute Canada expects to have its updated 18 month budget for the period October 1, 2013 to March 31, 2015 completed and approved in the next 60 days.

Compute Canada is below budget by just under \$1 million for the period April 2, 2012 to March 31, 2013, representing a variance of less than 4%. The most significant variances are attributed to the maintenance and warranty and services categories.

The maintenance and warranty category has a variance of \$600K from the budget, mostly due to a decision related to a warranty. A large system located at the University of Toronto and purchased during the national platforms fund came off warranty in this period. This system is critical to the researchers supported by Compute Canada and as such the extended warranty was budgeted to keep it operational. An assessment found that the cost of replacing the parts expected to fail would be lower than extending the warranty. This will result in a higher cost budgeted to replacement parts in the future, but an overall cost reduction.

The second largest variance from budget is 200K on the services category which mostly relates to the cost of utilities. The most substantial amount is the result of a formula error on the original budgets related to an over estimation of \$150K at the University of Calgary.

Compute Canada budgeted 137.8 staff and is reporting 137 staff. The slight variance is due to hires not being in place when expected during the period.

In 2012-13 there were some significant differences on a few items by region. Compute Canada did not have confirmed funding from the MSI program until late in 2012 and as a result institutions and/or regions were required to front the cost of operations. As such, given limited funds and differences related to existing grants, institutions made varying decisions on risk and how to spend the limited funds. In the coming year, spending will be rationalized on a national level and will be more consistent by region when based on the size of the region in terms of users.

The most significant differences by region are the larger spending on both maintenance and services in Ontario. Both of these variances were expected given the larger amount of

infrastructure that is deployed in Ontario, a larger portion of which is coming off of warranty but still deemed useful, resulting in a larger cost to keep these systems operational. Services are higher not only due to the larger amount of infrastructure deployed but the higher cost of electricity in the province.

Outreach expenditures for the period also varied by region. In particular, Calcul Quebec ran a large, two-week international summer school in HPC. The school had been planned in advance and science departments, the University of Sherbrooke and the province of Québec contributed the funds for the event. Compute Canada is reviewing the results of this event to determine the most appropriate deployment of resources for training and outreach in the coming years. Each year, one region is selected to host HPCS. This year it was run in Vancouver hosted by WestGrid. As such, the outreach cost for this region is higher.

The matching funding in the province of Ontario was confirmed, but the funds were not released in 2012-14. As a result, the University of Toronto and Queens University provided a “loan” as a match until the funds flow from the province. This loan ensures that overall CC is not exceeding the 40% contribution from CFI in year 1. Similarly, funding was loaned from Memorial University of Newfoundland in Atlantic Canada to cover delayed matching funds flowing to the appropriate institutions in Atlantic Canada. In year 2, those institutions will be repaid when the money flows from the provinces.

2. Please discuss the strategy to secure the operations and maintenance budget for the upcoming year. This should include all anticipated and committed revenues from other sources: user fees, if applicable, and contributions from universities and other organizations.

In 2012-13 matching revenues were contributed by 24 institutions, 8 provinces (2 from the province of Quebec), 11 vendors (through the annual HPCS conference), 10 non-profit contributors and NSERC. Compute Canada has secured all the matching funding for fiscal 2013-14. The sources of funding will be similar to that in the previous year.

Beyond March 31, 2014 some matching contributions have yet to be secured. Compute Canada is currently developing the details on the 18-month budget for the period October 1, 2013 to March 31, 2015 and the exact details on short-falls in contributions will be known at that time. A summary of matching contributions for the 2014-15 (Fiscal 2015) by region is as follows:

Atlantic Canada – all institutional and provincial matching sources confirmed.

Quebec – Matching funding for Fiscal 2015 is not yet secured. The request is with the province awaiting a formal response. There is no indication on the timing of notification about the request.

Ontario – Matching funding for Fiscal 2015 is not yet formally confirmed. However, the province is committed to the advanced computing agenda. Advanced computing is seen as a competitive advantage for the province of Ontario and CC has received positive signals

from the province that a significant portion of the matching funds for Fiscal 2015 will be available.

West – Matching funds for Manitoba, Saskatchewan and Alberta have been secured through Fiscal 2015. Matching funds from the province of British Columbia (BC) to support the operations and maintenance of the project have yet to be confirmed.

3. Please describe plans for the use of the CFI and MRS funds for the next fiscal year (April 1, 2013 to March 31, 2014).

Compute Canada will use CFI and matching funds to continue operations of the network in 2013-14. Compute Canada's expenditures are forecasted to increase by 18% (\$4.6 million) in year 2. The increase in expenditures is due to a number of factors:

- Expenditures in year 1 were delayed due to uncertainty in funding from the MSI program. Confirmation of funding from CFI and most of the provincial partners was not confirmed until late in year 1 or in some cases not until year 2.
- Compute Canada is currently developing working relationships with key life sciences organizations and this will add nodes to the Compute Canada network. The expanded scope in services will increase expenses significantly (estimated at \$2 million).
- Compute Canada's major infrastructure purchases from the national platforms fund are starting to become out of warranty. These systems are still critical and as a result a large budget must be allocated to maintenance and repairs to keep these systems operational. Although a significant amount has been budgeted on this line all purchases will be considered as part of the Operational and Maintenance plan (see key changes below).
- The other significant budget increase relates to the general administration category. This increase is attributed to delayed expenditures as noted above, but also due in large part to a delay in setting up the national office. Compute Canada is also in the process of developing the outreach, education and training plan. The majority of the costs associated with supporting these critical activities are budgeted in the general admin category.

Some key changes for the 2013-14 budget starting October 1, 2013 will include:

- All spending on maintenance and repairs items will need considered as part of the ongoing Operational and Maintenance plan (which includes the targets for decommissioning each system). The operational and maintenance plan will outline the useful life of all systems. Purchases on this line item will be done based on a budget; the CEO must approve significant purchases within a Board approved budget.
- Similar to maintenance and repairs, services (ie: utilities) can only be put onto the budget for systems that are deemed to be "useful" as per the ongoing Operational and Maintenance plan.

- Spending for general and admin items will be done based on budgets, which contain principals to guide items such as admin supplies, travel & professional development for staff.
- Outreach spending will be done based on the strategic plan for Outreach, Education and Training. However, it will be important that flexibility be built into the budget for local and regional activities that are not planned, but will provide significant benefit to the national platform.

As with the year 1 budget, the majority of expenses will cover personnel and utilities.

Appendix A: Scientific Contributions

Books :

Pan, Yuanming. First-principles calculations of the E'1 center in quartz: Structural models, ²⁹Si hyperfine parameters and association with Al impurity (2012).

Santos, Marcelo. Fitting of NWM Ray-traced Slant Factors to Closed-form Tropospheric Mapping Functions: Preliminary Results (2012).

Pink, David. Intercrystalline Interactions (2012).

Lin, John. Lagrangian Modeling of the Atmosphere (2012).

Dory, Yves. Molecular Self-Assembly: Advances and Applications (2012).

van Breemen, Cornelis. Store-operated Calcium Entry (SOCE) Pathways (2012).

Book Content:

Donovan, Eric. Auroral Disturbances as a Manifestation of Interplay Between Large-Scale and Mesoscale Structure of Magnetosphere-Ionosphere Electrodynamical Coupling (2012).

Guarini, Marcello. Case Classification, Similarities, Spaces of Reasons, and Coherences (2012).

Bengio, Yoshua. Disentangling Factors of Variation for Facial Expression Recognition (2012).

Wen, Dunwei. Exploiting Semantic Roles for Asynchronous Question Answering in an Educational Setting (2012).

Li, Ming. How Accurately Can We Model Protein Structures with Dihedral Angles? (2012).

Wang, Yang. Image Retrieval with Structured Object Queries Using Latent Ranking SVM (2012).

Li, Ming. LoopWeaver – Loop Modeling by the Weighted Scaling of Verified Proteins (2012).

Donovan, Eric. Magnetospheric Dynamics and the Proton Aurora (2012).

Rouat, Jean. Models of Information Processing in the Visual Cortex (2012).

L'Ecuyer, Pierre. On Figures of Merit for Randomly-Shifted Lattice Rules (2012).

Salahub, Dennis. Recent Progress in Density Functional Methodology for Biomolecular Modeling (2012).

Rouat, Jean. Regulation toward Self-organized Criticality in a Recurrent

Spiking Neural Reservoir (2012).

Comtois, Philippe. Remodeling and Reverse Remodeling: Mapping/Imaging Findings (2012).

Pomès, Régis. Structural Disorder and Protein Elasticity (2012).

Journals:

Carrington, Tucker. K-independent vibrational bases for systems with large amplitude motion. (2012).

Zhorov, Boris. 1,4-Dihydropyridine Scaffold in Medicinal Chemistry, The Story So Far And Perspectives (Part 2): Action in Other Targets and Antitargets (2012).

Booth, Valerie. ²H Solid-State Nuclear Magnetic Resonance Investigation of Whole *Escherichia coli* Interacting with Antimicrobial Peptide MSI-78 (2012).

Warkentin, Andrew. 3D metal removal simulation to determine uncut chip thickness, contact length, and surface finish in grinding (2012).

Noskov, Sergei. 4-(4-(Dimethylamino)phenyl)-1-methylpyridinium (APP+) Is a Fluorescent Substrate for the Human Serotonin Transporter (2012).

DiLabio, Gino. A (Nearly) Universally Applicable Method for Modeling Noncovalent Interactions Using B3LYP (2012).

Lin, John. A backward-time stochastic Lagrangian air quality model (2012).

Reesor, Mark. A Bias Reduction Technique for Monte Carlo Pricing of Early-exercise options (2012).

Sargent, Edward. A Charge-Orbital Balance Picture of Doping in Colloidal Quantum Dot Solids (2012).

Eikerling, Michael. A Comparative Ab Initio Study of the Primary Hydration and Proton Dissociation of Various Imide and Sulfonic Acid Ionomers (2012).

Bentourkia, M'hamed. A comparison of a Monte Carlo-based detection probability matrix with analytical probability matrix for small animal PET scanners (2012).

Ilie, Lucian. A comparison of index-based lempel-Ziv LZ77 factorization algorithms (2012).

Thomas, James. A Comparison of Shiga-Toxin 2 Bacteriophage from Classical Enterohemorrhagic *Escherichia coli* Serotypes and the German *E. coli* O104:H4 Outbreak Strain (2012).

Straatman, Anthony. A Comparison of Thermal Dispersion Behaviour in High-Conductivity Porous Media of Various Pore Geometries (2012).

Gu, Jeff. A compressive sensing framework for seismic source parameter

estimation (2012).

Deza, Antoine. A computational framework for determining run-maximal strings (2012).

Straatman, Anthony. A computational method for geometric optimization of enhanced heat transfer devices based upon entropy generation minimization (2012).

van Beek, Peter. A computational study of heuristic and exact techniques for superblock instruction scheduling (2012).

Gerber, Andrew. A Computational Study of Sprays Produced by Rotary Cage Atomizers (2012).

van Beek, Peter. A Constraint Programming Approach for Integrated Spatial and Temporal Scheduling for Clustered Architectures (2012).

Horbatsch, Marko. A correction to Birks' Law in liquid argon ionization chamber simulations for highly ionizing particles (2012).

Ormiston, Scott. A Coupled Pressure-Based Co-Located Finite-Volume Solution Method for Natural-Convection Flows (2012).

Peltier, Richard. A data-calibrated distribution of deglacial chronologies for the North American ice complex from glaciological modeling (2012).

Fried, Eliot. A deconvolution enhancement of the Navier-Stokes-__ model (2012).

Peslherbe, Gilles. A density-functional theory investigation of the structural and spin properties of $(\text{PO}_2)_4(\text{WO}_3)_8$ model bronzes (2012).

Renksizbulut, Metin. A detailed comparison between Navier-Stokes and DSMC simulations of gaseous flow in microchannels (2012).

Staroverov, Viktor. A generalized gradient approximation for exchange derived from the model potential of van Leeuwen and Baerends (2012).

Wong, Gane Ka-Shu. A genome triplication associated with early diversification of the core eudicots (2012).

Pérusse, Louis. A genome-wide approach accounting for body mass index identifies genetic variants influencing fasting glycemc traits and insulin resistance (2012).

Plamondon, Réjean. A Globally Optimal Estimator for the Delta-Lognormal Modeling of Fast Reaching Movements (2012).

Foster, Leonard. A high-throughput approach for measuring temporal changes in the interactome (2012).

Martins, Joaquim. A homogenization-based theory for anisotropic beams with accurate through-section stress and strain prediction (2012).

Rei, Walter. A Hybrid Genetic Algorithm for Multidepot and Periodic Vehicle Routing Problems (2012).

Basu, Shantanu. A HYBRID SCENARIO FOR THE FORMATION OF BROWN DWARFS AND VERY LOW MASS STARS (2012).

Alam, Jahrul. A Lagrangian approach for modelling electro-kinetic mass transfer in microchannels (2012).

Duncan, Martin. A LAGRANGIAN INTEGRATOR FOR PLANETARY ACCRETION AND DYNAMICS (LIPAD) (2012).

Eliasmith, Chris. A Large-Scale Model of the Functioning Brain (2012).

Awadalla, Philip. A Likelihood-Based Framework for Variant Calling and De Novo Mutation Detection in Families (2012).

Holder, Gil. A MEASUREMENT OF GRAVITATIONAL LENSING OF THE MICROWAVE BACKGROUND USING SOUTH POLE TELESCOPE DATA (2012).

Tafirout, Reda. A measurement of the ratio of the W and Z cross sections with exactly one associated jet in pp collisions at with ATLAS (2012).

Lien, Fue-Sang. A method for coupling free molecular and continuum regime methods in order to simulate chemical vapor deposition (2012).

German, Daniel. A Method for Open Source License Compliance of Java Applications (2012).

Proulx, Pierre. A model for cellulase production from *Trichoderma reesei* in an airlift reactor (2012).

Gauld, James. A Molecular Dynamics (MD) and Quantum Mechanics/Molecular Mechanics (QM/MM) Study on Ornithine Cyclodeaminase (OCD): A Tale of Two Iminiums (2012).

Karttunen, Mikko. A molecular dynamics implementation of the 3D Mercedes-Benz water model (2012).

Hoyt, Jeffrey. A molecular dynamics simulation study of the velocities, mobility and activation energy of an austenite-ferrite interface in pure Fe (2012).

Krishnamurthy, Vikram. A molecular machine biosensor: Construction, predictive models and experimental studies (2012).

Lacroix, Frédéric. A Monte Carlo based formalism to identify potential locations at high risk of tumor recurrence with a numerical model for glioblastoma multiforme (2012).

Rechnitzer, Andrew. A Monte Carlo study of non-trapped self-avoiding walks (2012).

Alam, Jahrul. A Multiresolution Model for the Simulation of Transient Heat and Mass Transfer (2012).

Bertrand, François. A multiscale model for the simulation of granulation in rotor-based equipment (2012).

Peng, Yingwei. A new approach for joint modelling of longitudinal measurements and survival times with a cure fraction (2012).

Zhang, Chao. A New Approach To Specify the Inlet Boundary Conditions for Computational Fluid Dynamics (CFD) Modeling of Hydrodynamic Behavior of a Circulating Fluidized Bed (CFB) Riser (2012).

Trépanier, Jean-Yves. A new axial velocity defect formulation for a far-field drag decomposition method (2012).

Roy, Pierre-Nicholas. A new four-dimensional ab initio potential energy surface for N₂O-He and vibrational band origin shifts for the N₂O-HeN clusters with N = 1-40 (2012).

Lewis, Marlon. A new instrument for measuring the high dynamic range radiance distribution in near-surface sea water (2012).

Behjat, Laleh. A New Length-Based Algebraic Multigrid Clustering Algorithm (2012).

Risk, Dave. A new method for real-time monitoring of soil CO₂ efflux (2012).

Hugenholtz, Chris. A new tool for modeling dune field evolution based on an accessible, GUI version of the Werner dune model (2012).

Bevan, Kirk. A non-parabolic single-band tight binding approach: capturing conduction band bending, charge accumulation and quantization at non-polar InN surfaces (2012).

Pralat, Pawel. A note on off-diagonal small on-line Ramsey numbers for paths (2012).

Noghanian, Sima. A Novel Microwave Tomography System Based on the Scattering Probe Technique (2012).

Dworkin, Seth. A numerical and experimental study of soot formation in a laminar coflow diffusion flame of a Jet A-1 surrogate (2012).

Dworkin, Seth. A numerical study of high pressure, laminar, sooting, ethane-air coflow diffusion flames (2012).

Sheng, Jinyu. A numerical study of the circulation and monthly-to-seasonal variability in the Caribbean Sea: the role of Caribbean eddies (2012).

Rouat, Jean. A Parallel Supercomputer Implementation of a Biological Inspired Neural Network and its use for Pattern Recognition (2012).

O'Neil, Dugan. A Particle Consistent with the Higgs Boson Observed with the ATLAS Detector at the Large Hadron Collider (2012).

Roy, Pierre-Nicholas. A path-integral Langevin equation treatment of low-temperature doped helium clusters (2012).

Soulaïmani, Azzeddine. A POD-based reduced-order model for free surface shallow water flows over real bathymetries for Monte-Carlo-type applications (2012).

Burda, Martin. A Poisson mixture model of discrete choice (2012).

Hallam, Steven. A programmable droplet-based microfluidic device applied to multiparameter analysis of single microbes and microbial communities (2012).

Simmonds, Rob. A protocol for quantifying the carbon reductions achieved through the provision of low or zero carbon ICT services (2012).

Vargas-Baca, Ignacio. A push-pull azobenzene is mercurated twice at the ring with less electron density (2012).

Horbatsch, Marko. A reduced-geometry independent particle model calculation of high harmonic generation from closed-shell diatomic molecules (2012).

Thompson, Mary. A resampling approach to estimate variance components of multilevel models (2012).

Muzychka, Yuri. A review on numerical studies of slug flow hydrodynamics and heat transfer in microtubes and microchannels (2012).

Areibi, Shawki. A scalable pipelined architecture for real-time computation of MLP-BP neural networks (2012).

O'Neil, Dugan. A search for \overline{t} resonances in lepton+jets events with highly boosted top quarks collected in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector (2012).

O'Neil, Dugan. A search for $t\bar{t}$ resonances with the ATLAS detector in 2.05 fb⁻¹ of proton-proton collisions at $\sqrt{s} = 7$ TeV (2012).

O'Neil, Dugan. A search for flavour changing neutral currents in top-quark decays in pp collision data collected with the ATLAS detector at $\sqrt{s}=7$ TeV (2012).

Peng, Yingwei. A semiparametric marginal mixture cure model for clustered survival data (2012).

Piomelli, Ugo. A simple technique for the visualisation of eddy kinematics in turbulent flows (2012).

Huang, Yi. A simulated climatology of spectrally decomposed atmospheric infrared radiation (2012).

Nathoo, Farouk. A Skew-t space-varying regression model for the spectral analysis of resting state brain activity (2012).

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Bennet, Andrew. A Stepwise Solvent-Promoted S_Ni Reaction of α -D-Glucopyranosyl Fluoride: Mechanistic Implications for Retaining Glycosyltransferases (2012).

Guindon, Yvan. A Stereoselective Approach to α -L-Arabinose Nucleoside Analogues: Synthesis and Cyclization of Acyclic 1,2-synN,O-Acetals (2012).

Emslie, David. A study of M-X-BR₃ (M = Pt, Pd or Rh; X = Cl or I) interactions in square planar ambiphilic ligand complexes: structural, spectroscopic, electrochemical and computational comparisons with borane-free analogues (2012).

Vetterli, Michel. A study of the material in the ATLAS inner detector using secondary hadronic interactions (2012).

Salahub, Dennis. A theoretical study of the mechanism of the nucleotidyl transfer reaction catalyzed by yeast RNA polymerase II (2012).

Pérusse, Louis. A Variant in the LRRFIP1 Gene Is Associated With Adiposity and Inflammation (2012).

Ayers, Paul. A variational principle for the electron density using the exchange hole & its implications for N-representability (2012).

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Rottler, Joerg. Ab initio calculations of rare-earth diffusion in magnesium (2012).

Navratil, Petr. Ab Initio Many-Body Calculations of the $^3\text{H}(d,n)^4\text{He}$ and $^3\text{He}(d,p)^4\text{He}$ Fusion Reactions (2012).

Duley, Walt. Ab initio Calculations of Some Electronic and Vibrational Properties of Molecules Based on Multi-Layered Stacks of Cyclic C₆ (2012).

Liu, Michelle XiaoQing. ABCG2 null alleles define the Jr(a₋) blood group phenotype (2012).

Stauffer, Allan. Absolute differential cross sections for electron excitation of silver at small scattering angles (2012).

McAdams, Stephen. Abstract Encoding of Auditory Objects in Cortical Activity Patterns (2012).

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Macdonald, Charles. Accessing the Coordination Chemistry of Phosphorus(I)

Zwitterions (2012).

Ziegler, Tom. Accurate Theoretical Description of the L and Lb Excited States in Acenes Using the All Order Constricted Variational Density Functional Theory Method and the Local Density Approximation (2012).

Wu, Patrick. Activity along the Osning Thrust in Central Europe during the Lateglacial: ice-sheet and lithosphere interactions (2012).

Ayers, Paul. Addressing the Coulomb potential singularity in exchange-correlation energy integrals with one-electron and two-electron basis sets (2012).

Moreau, Stéphane. Aeroacoustics research in Europe: The CEAS-ASC report on 2011 highlights (2012).

Martins, Joaquim. Aeroservoelastic Design Optimization of a Flexible Wing (2012).

Patey, Gren. Aggregation in dilute aqueous tert-butyl alcohol solutions: Insights from large-scale simulations (2012).

Roger, Andrew. Aggregative Multicellularity Evolved Independently in the Eukaryotic Supergroup Rhizaria (2012).

Moreau, Stéphane. Airfoil Trailing-Edge Blowing: Broadband Noise Prediction from Large-Eddy Simulation (2012).

Stanford, William. Alcohol Impairs the Myeloid Proliferative Response to Bacteremia in Mice by Inhibiting the Stem Cell Antigen-1-ERK Pathway. (2012).

Beaulieu, Luc. ALGEBRA: ALgorithm for the heterogeneous dosimetry based on GEANT4 for BRACHYtherapy (2012).

Daley, Mark. Algorithmic decomposition of shuffle on words (2012).

Mousseau, Normand. All-Atom Stability and Oligomerization Simulations of Polyglutamine Nanotubes with and without the 17-Amino-Acid N-Terminal Fragment of the Huntingtin Protein (2012).

Giannacopoulos, Dennis. Alternate Parallel Processing Approach for FEM (2012).

Lamoureux, Guillaume. Ammonium Transporters Achieve Charge Transfer by Fragmenting Their Substrate (2012).

Singh, Chandra Veer. Amorphous TiO₂ as a Photocatalyst for Hydrogen Production: A DFT Study of Structural and Electronic Properties (2012).

Mongeau, Luc. An absorbing boundary condition for the lattice Boltzmann method based on the perfectly matched layer (2012).

Gauld, James. An Active Site Water Broadens Substrate Specificity in S-Ribosylhomocysteinase (LuxS): A Docking, MD, and QM/MM Study (2012).

Behjat, Laleh. An algebraic multigrid-based algorithm for circuit clustering (2012).

Ziegler, Tom. An analysis of unsupported triple and quadruple metal-metal bonds between two homonuclear group 6 transition elements based on the combined natural orbitals for chemical valence and extended transition state method (2012).

Gauld, James. An assessment of pure, hybrid, meta, and hybrid-meta GGA density functional theory methods for open-shell systems: The case of the nonheme iron enzyme 8R-LOX (2012).

Peslherbe, Gilles. An electronic structure theory investigation of the physical chemistry of the intermolecular complexes of cyclopropenylidene with hydrogen halides (2012).

Forte, Alessandro. An enigma in estimates of the Earth's dynamic ellipticity (2012).

Bergthorson, Jeffrey. An Evaluation of Numerical Models for Temperature-Stabilized CH₄/Air Flames in a Small Channel (2012).

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Charbonneau, Paul. An Exploration of Non-kinematic Effects in Flux Transport Dynamos (2012).

Peng, Yingwei. An extended cure model and model selection (2012).

Zhang, Junfeng. An improved bounce-back scheme for complex boundary conditions in lattice Boltzmann method (2012).

Jamieson, Randy. An instance theory of associative learning (2012).

Awadalla, Philip. An integrated map of genetic variation from 1,092 human genomes (2012).

Martins, Joaquim. An isoparametric approach to level set topology optimization using a body-fitted finite-element mesh (2012).

Majewski, Jacek. An RMND1 Mutation Causes Encephalopathy Associated with Multiple Oxidative Phosphorylation Complex Deficiencies and a Mitochondrial Translation Defect (2012).

James, Thomas. Analysis of GPS Measurements in Eastern Canada Using Principal Component Analysis (2012).

Gordon, Reuven. Analysis of hybrid plasmonic-photonic crystal structures using perturbation theory (2012).

Sushama, Laxmi. Analysis of streamflow characteristics over Northeastern Canada in a changing climate (2012).

Guttman, David. Analysis of the Cystic Fibrosis Lung Microbiota via Serial Illumina Sequencing of Bacterial 16S rRNA Hypervariable Regions (2012).

Pollard, Andrew. Analysis of the pressure fluctuations from an LBM simulation of turbulent channel flow (2012).

Ziegler, Tom. Analysis of the Putative Cr–Cr Quintuple Bond in Ar₂CrCrAr₂ (Ar = C₆H₃-2,6(C₆H₃-2,6-Pri)₂) Based on the Combined Natural Orbitals for Chemical Valence and Extended Transition State Method (2012).

Wachowiak, Mark. Analyzing the combined influence of solar activity and El Niño on streamflow across southern Canada (2012).

Alpas, Ahmet T.. Anchoring platinum on graphene using metallic adatoms: a first principles investigation (2012).

Pearson, Jason. Angular dependence of the two-electron interelectron distribution (2012).

Woo, Tom. Anisotropic oxidation of bismuth nanostructures: Evidence for a thin film allotrope of bismuth (2012).

Kusalik, Peter. Anisotropy in the crystal growth of hexagonal ice, Ih (2012).

Sutherland, Todd. Anthraquinone derivatives as electron-acceptors with liquid crystalline properties (2012).

Szpunar, Barbara. Application of density functional theory in assessing properties of thorium and recycled fuels (2012).

Ziegler, Tom. Application of magnetically-perturbed time-dependent density functional theory to magnetic circular dichroism. IV. The influence of zero-field splitting on the spectra of S=1/2 molecules (2012).

Chartrand, Patrice. Application of the CALPHAD method to predict the thermal conductivity in dielectric and semiconductor crystals (2012).

Bushe, Kendal. Application of the conditional source-term estimation model for turbulence–chemistry interactions in a premixed flame (2012).

Gauld, James. Applications of Potential Energy Surfaces in the Study of Enzymatic Reactions (2012).

Zhorov, Boris. Architecture and Pore Block of Eukaryotic Voltage-Gated Sodium Channels in View of NavAb Bacterial Sodium Channel Structure (2012).

Stauffer, Allan. Argon plasma modeling with detailed fine-structure cross sections (2012).

Diallo, Abdoulaye. Armadillo 1.0: workflow platform for bioinformatics (2012).

Makarenkov, Vladimir. Armadillo 1.1: An Original Workflow Platform for

Designing and Conducting Phylogenetic Analysis and Simulations (2012).

Rubinstein, John. Arrangement of subunits in intact mammalian mitochondrial ATP synthase determined by cryo-EM (2012).

Tarasov, Lev. Artificial neural network assisted Bayesian calibration of climate models (2012).

Wang, Zilin. Assessing area-specific relative risks from large forest fire size in Canada (2012).

Kang, Jian. Assessing the representativeness of Canadian Hospitals Injury Reporting and Prevention Programme (CHIRPP) sport and recreational injury data in Calgary, Canada (2012).

Vanrolleghem, Peter. Assessing the use of activated sludge process design guidelines in wastewater treatment plant projects: A methodology based on global sensitivity analysis (2012).

Lu, Youyu. Assessment of a NEMO-based hydrodynamic modelling system for the Great Lakes (2012).

Karttunen, Mikko. Assessment of Common Simulation Protocols for Simulations of Nanopores, Membrane Proteins, and Channels (2012).

Becke, Axel. Assessment of the PW86+PBE+XDM density functional on van der Waals complexes at non-equilibrium geometries (2012).

Brisson, Marc. Association between prodromal pain and the severity of acute herpes zoster and utilization of health care resources (2012).

Kennett, Malcolm. Asymmetric spatial structure of zero modes for birefringent Dirac fermions (2012).

Shi, Yujun. Asymmetrically distorted structures of monosilacyclobutane and disilacyclobutane radical cations studied by ab initio and density functional theories (2012).

Salahub, Dennis. Asymptotic Expansion for Electrostatic Embedding Integrals in QM/MM Calculations (2012).

O'Neil, Dugan. ATLAS measurements of the properties of jets for boosted particle searches (2012).

O'Neil, Dugan. ATLAS search for a heavy gauge boson decaying to a charged lepton and a neutrino in pp collisions at $\sqrt{s} = 7 \text{ TeV}$ (2012).

Song, Jun. Atomic mechanism and prediction of hydrogen embrittlement in iron (2012).

Becke, Axel. Atomic volumes and polarizabilities in density-functional theory (2012).

Schougaard, Steen. Atomistic modeling of site exchange defects in lithium

iron phosphate and iron phosphate (2012).

Noskov, Sergei. Atomistic models of ion and solute transport by the sodium-dependent secondary active transporters (2012).

Matida, Edgar. Atomization performance of petroleum coke and coal water slurries from a twin fluid atomizer (2012).

Brabec, Thomas. Attosecond Plasma Wave Dynamics in Laser-Driven Cluster Nanoplasmas (2012).

Chen, Jing. Attributing carbon changes in conterminous U.S. forests to disturbance and non-disturbance factors from 1901 to 2010 (2012).

Higgs, Paul. Autocatalytic Replication and Homochirality in Biopolymers: Is Homochirality a Requirement of Life or a Result of It? (2012).

Ayers, Paul. Automated Parametrization of AMBER Force Field Terms from Vibrational Analysis with a Focus on Functionalizing Dinuclear Zinc(II) Scaffolds (2012).

Sutherland, Bruce. Axisymmetric intrusions in two-layer and uniformly stratified environments with and without rotation (2012).

Clarke, David. AZEuS: An Adaptive Zone Eulerian Scheme for Computational MHD (2012).

Woo, Tom. Back Cover: Characterization of Zn-Containing Metal-Organic Frameworks by Solid-State⁶⁷Zn NMR Spectroscopy and Computational Modeling (Chem. Eur. J. 39/2012) (2012).

Huang, Yining. Back Cover: Solid-State⁷³Ge NMR Spectroscopy of Simple Organogermanes (Chem. Eur. J. 43/2012) (2012).

Boissonneault, Maxime. Back-action of a driven nonlinear resonator on a superconducting qubit (2012).

Wishart, David. BacMap: an up-to-date electronic atlas of annotated bacterial genomes (2012).

Corbeil, Jacques. Bacterial Meningitis and Pneumococcal Serotype Distribution in Children in Cameroon (2012).

Talman, James. Basis set independent calculation of molecular polarizabilities (2012).

Guillotte, Simon. Bayesian estimation of a bivariate copula using the Jeffreys prior (2012).

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Thompson, Russell. Benchmarking a self-consistent field theory for small amphiphilic molecules (2012).

Naumkin, Fedor. Beryllium cluster cages endohedrally doped by hydrogen: H₂@Ben (8 ≤ n ≤ 14) (2012).

Bengio, Yoshua. Beyond Skill Rating: Advanced Matchmaking in Ghost Recon Online (2012).

Pomès, Régis. Binding of Inositol Stereoisomers To Model Amyloidogenic Peptides (2012).

Ziegler, Tom. Binding of Molecular Magnesium Hydrides to a Zirconocene-Enyne Template (2012).

Buriak, Jillian. Block copolymer-templated chemical nanopatterning on pyrolyzed photoresist carbon films (2012).

Menzinger, Michael. Blocking and transmission of traveling flow-distributed-oscillation waves in an absolutely unstable flowing medium (2012).

Wu, Xiaohua. Boundary layer turbulence in transitional and developed states (2012).

Rouat, Jean. Brain at work: time, sparseness and superposition principles (2012).

Haykin, Simon. Brain-Inspired Dynamic Spectrum Management for Cognitive Radio Ad Hoc Networks (2012).

Stanford, William. BRCA2 deficiency exaggerates doxorubicin-induced cardiomyocyte apoptosis and cardiac failure. (2012).

Tremblay, André-Marie. Breakdown of Fermi liquid behavior at the $(\pi, \pi) = 2k_{\text{F}}$ spin-density wave quantum-critical point: The case of electron-doped cuprates (2012).

Paus, Tomas. Breastfeeding and brain structure in adolescence (2012).

Zysman-Colman, Eli. Bright electrochemiluminescence of iridium(III) complexes (2012).

Schurko, Robert. Broadband adiabatic inversion pulses for cross polarization in wide-line solid-state NMR spectroscopy (2012).

Noskov, Sergei. BROMOC-D: Brownian Dynamics/Monte-Carlo Program Suite to Study Ion and DNA Permeation in Nanopores (2012).

Corbeil, Jacques. Building an HIV data mashup using Bio2RDF (2012).

Couchman, Hugh. BUILDING THE STELLAR HALO THROUGH FEEDBACK IN DWARF GALAXIES (2012).

Wetmore, Stacey. C8-Heteroaryl-2'-deoxyguanosine Adducts as Conformational Fluorescent Probes in the NarI Recognition Sequence (2012).

Tomberli, Bruno. Calculating diffusion and permeability coefficients with

the oscillating forward-reverse method (2012).

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Xu, Yunjie. Conformations of [(R,R)-1,5-diaza-cis-decalin] copper (II) complex and its hydrogen bonding interaction with the crystal water: A combined experimental VA, UV–Vis and ECD spectroscopic and DFT study (2012).

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Mann, Robert. Critical collapse in Einstein-Gauss-Bonnet gravity in five and six dimensions (2012).

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(2012).

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Mousseau, Normand. Distinct Dimerization for Various Alloforms of the Amyloid-Beta Protein: A₁₋₄₀, A₁₋₄₂, and A₁₋₄₀(D23N) (2012).

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Xu, Yunjie. Effects of electron configuration and coordination number on the vibrational circular dichroism spectra of metal complexes of trans-1,2-diaminocyclohexane (2012).

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Stauffer, Allan. Electron-impact excitation of zinc and ytterbium atoms (2012).

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Coulomb Collisions (2012).

Siu, K.W. Michael. Elimination of water from the backbone of protonated tetraglycine (2012).

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Vetterli, Michel. Erratum to:
Search for first generation scalar leptosquarks in pp collisions at with the ATLAS detector
[Phys. Lett. B 709 (2012) 158] (2012).

Chan, Hue Sun. Escape from Adaptive Conflict follows from weak functional trade-offs and mutational robustness (2012).

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Iodine (2012).

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Signorell, Ruth. Infrared spectroscopy and modeling of co-crystalline CO₂·C₂H₂ aerosol particles. II. The structure and shape of co-crystalline CO₂·C₂H₂ aerosol particles (2012).

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Tafirout, Reda. Measurement of the cross section in pp collisions at with the ATLAS experiment (2012).

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Vetterli, Michel. Measurement of the inclusive W^{\pm} and Z/γ cross sections in the e and μ decay channels in pp collisions at $\sqrt{s}=7 \text{ TeV}$ with the ATLAS detector (2012).

Vetterli, Michel. Measurement of the isolated diphoton cross section in pp collisions at $\sqrt{s}=7 \text{ TeV}$ with the ATLAS detector (2012).

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Tafirout, Reda. Measurement of the WW cross section in pp collisions with the ATLAS detector and limits on anomalous gauge couplings (2012).

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O'Neil, Dugan. Measurement of $W \pm Z$ production in proton-proton collisions at $\sqrt{s}=7$ TeV with the ATLAS detector (2012).

O'Neil, Dugan. Measurement of W and Z production cross sections in pp collisions at and limits on anomalous triple gauge couplings with the ATLAS detector (2012).

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two leptons with the ATLAS detector at the LHC (2012).

O'Neil, Dugan. Search for a Light Higgs Boson Decaying to Long-Lived Weakly Interacting Particles in Proton-Proton Collisions at $\sqrt{s}=7$ TeV with the ATLAS Detector (2012).

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O'Neil, Dugan. Search for supersymmetry in pp collisions at $\sqrt{s}=7\text{ TeV}$ in final states with missing transverse momentum and b-jets with the ATLAS detector (2012).

O'Neil, Dugan. Search for supersymmetry with jets, missing transverse

momentum and at least one hadronically decaying τ lepton in proton–proton collisions at with the ATLAS detector (2012).

O'Neil, Dugan. Search for $t\bar{t}$ Resonances in Proton-Proton Collisions at $\sqrt{s}=7$ TeV with the ATLAS Detector (2012).

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O'Neil, Dugan. Search for the decay with the ATLAS detector (2012).

O'Neil, Dugan. Search for the Higgs boson in the decay channel at with the ATLAS detector (2012).

Tafirout, Reda. Search for the Higgs Boson in the $H_{WW^{(*)}}\tau^+\tau^-$ Decay Channel in pp Collisions at $\sqrt{s}=7$ TeV with the ATLAS Detector (2012).

Warburton, Andreas. Search for the Standard Model Higgs Boson Decaying to a $b\bar{b}$ Pair in Events with One Charged Lepton and Large Missing Transverse Energy Using the Full CDF Data Set (2012).

Tafirout, Reda. Search for the Standard Model Higgs boson in the decay channel with 4.8 fb of pp collision data at with ATLAS (2012).

O'Neil, Dugan. Search for the Standard Model Higgs boson in the decay mode with of ATLAS data at (2012).

Tafirout, Reda. Search for the Standard Model Higgs Boson in the Diphoton Decay Channel with 4.9 fb of pp Collision Data at $\sqrt{s}=7$ TeV with ATLAS (2012).

O'Neil, Dugan. Search for the Standard Model Higgs boson in the $H_{\tau\tau}$ decay mode in $\sqrt{s} = 7, \sqrt{s} = 8$ TeV pp collisions with ATLAS (2012).

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Warburton, Andreas. Search for the standard model Higgs boson produced in association with a W^{\pm} boson with 7.5 fb of integrated luminosity at CDF (2012).

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Lagüe, Patrick. The Influenza Fusion Peptide Adopts a Flexible Flat V Conformation in Membranes (2012).

Peltier, Richard. The Initiation of Modern Soft Snowball and Hard Snowball Climates in CCSM3. Part I: The Influences of Solar Luminosity, CO₂ Concentration, and the Sea Ice/Snow Albedo Parameterization (2012).

Peltier, Richard. The Initiation of Modern Soft Snowball and Hard Snowball Climates in CCSM3. Part II: Climate Dynamic Feedbacks (2012).

Peltier, Richard. The initiation of modern soft and hard Snowball Earth

climates in CCSM4 (2012).

Harrison, Paul. The Landscape of the Prion Protein's Structural Response to Mutation Revealed by Principal Component Analysis of Multiple NMR Ensembles (2012).

Fried, Eliot. The Leray--deconvolution model: Energy analysis and numerical algorithms (2012).

Yan, Zong-Chao. The long-range non-additive three-body dispersion interactions for the rare (2012).

Yan, Zong-Chao. The long-range non-additive three-body dispersion interactions for the rare gases, alkali, and alkaline-earth atoms (2012).

Stanford, William. The mammalian gene function resource: the International Knockout Mouse Consortium. (2012).

Griswold, Cortland. The mapping of epistatic effects onto a genealogical tree in haploid populations (2012).

Gsponer, Joerg. The Molecular Mechanism Underlying Mechanical Anisotropy of the Protein GB1 (2012).

Van Waerbeke, Ludovic. THE NEXT GENERATION VIRGO CLUSTER SURVEY (NGVS). I. INTRODUCTION TO THE SURVEY (2012).

Pfeiffer, Harald. The NINJA-2 catalog of hybrid post-Newtonian/numerical-relativity waveforms for non-precessing black-hole binaries (2012).

Harris, William. THE OBSERVATIONAL AND THEORETICAL TIDAL RADII OF GLOBULAR CLUSTERS IN M87 (2012).

Higgs, Paul. The origin of life is a spatially localized stochastic transition (2012).

Evans, Alan. The pipeline system for Octave and Matlab (PSOM): a lightweight scripting framework and execution engine for scientific workflows (2012).

Evans, Ben. The Pipid Root (2012).

Pratt, Derek. The Reactivity of Air-Stable Pyridine- and Pyrimidine-Containing Diarylamine Antioxidants (2012).

Bush, Andrew. The Role of Atmospheric Dynamics and Climate Change on the Possible Fate of Glaciers in the Karakoram (2012).

Tieleman, Peter. The Role of Atomic Polarization in the Thermodynamics of Chloroform Partitioning to Lipid Bilayers (2012).

van Breemen, Cornelis. The role of cytoplasmic nanospaces in smooth muscle cell Ca²⁺ signalling (2012).

Ziegler, Tom. The Role of External Alkoxysilane Donors on

Stereoselectivity and Molecular Weight in MgCl₂-Supported Ziegler–Natta Propylene Polymerization: A Density Functional Theory Study (2012).

Renksizbulut, Metin. THE ROLE OF THE VELOCITY DISTRIBUTION IN THE DSMC PRESSURE BOUNDARY CONDITION FOR GAS MIXTURES (2012).

Altosaar, Illimar. The starch granule associated proteomes of commercially purified starch reference materials from rice and maize (2012).

Couchman, Hugh. The stellar metallicity distribution of disc galaxies and bulges in cosmological simulations (2012).

Murray, Norman. The structure of the interstellar medium of star-forming galaxies (2012).

Rauk, Arvi. The Structures and Stabilities of the Complexes of Biologically Available Ligands with Fe(II) Porphine: An Ab Initio Study (2012).

Barbi, Mauricio. The T2K fine-grained detectors (2012).

Ayers, Paul. The Woodward–Hoffmann Rules Reinterpreted by Conceptual Density Functional Theory (2012).

Tuszynski, Jack. The Zinc Dyshomeostasis Hypothesis of Alzheimer's Disease (2012).

Schreckenbach, H. Georg. Theoretical exploration of uranyl complexes of a designed polypyrrolic macrocycle: structure/property effects of hinge size on Pacman-shaped complexes (2012).

Malardier-Jugroot, Cecile. Theoretical investigation of the use of doped graphene as a membrane support for effective CO removal in hydrogen fuel cells (2012).

Grein, Fritz. Theoretical studies on anionic clusters of sulfate anions and carbon dioxide, SO₄^{-1/2}(CO₂)_n, n = 1–4 (2012).

Grein, Fritz. Theoretical studies on clusters of carbonate with carbon dioxide, CO₃^{-1/2}(CO₂)_n, n = 1–5 – Comparison of carbonate clusters with sulfate clusters (2012).

Shamov, Grigory. Theoretical Study of the Reduction of Uranium(VI) Aquo Complexes on Titania Particles and by Alcohols (2012).

Rauk, Arvi. Theoretical Study on the Ring-Opening of 1,3-Disilacyclobutane and H₂ Elimination (2012).

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Whitmore, Mark. Theory of Lamellar Superstructure from a Mixture of Two

Cylindrical PS-PMMA Block Copolymers (2012).

Chartrand, Patrice. Thermodynamic evaluations and optimizations of binary Mg-light Rare Earth (La, Ce, Pr, Nd, Sm) systems (2012).

Chartrand, Patrice. Thermodynamic integration based on classical atomistic simulations to determine the Gibbs energy of condensed phases: Calculation of the aluminum-zirconium system (2012).

Melko, Roger. Thermodynamic singularities in the entanglement entropy at a two-dimensional quantum critical point (2012).

Dumas, Guy. Three-Dimensional Effects on an Oscillating-Foil Hydrokinetic Turbine (2012).

Groth, Clinton. Three-Dimensional Fluorescence Spectra of Thermally Stressed Commercial Jet A-1 Aviation Fuel in the Autoxidative Regime (2012).

Lien, Fue-Sang. Three-dimensional midpoint displacement algorithm for the generation of fractal porous media (2012).

Safi-Harb, Samar. THREE-DIMENSIONAL SIMULATIONS OF THE THERMAL X-RAY EMISSION FROM YOUNG SUPERNOVA REMNANTS INCLUDING EFFICIENT PARTICLE ACCELERATION (2012).

Kirczenow, George. Tight-binding model of Mn₁₂ single-molecule magnets: Electronic and magnetic structure and transport properties (2012).

Forte, Alessandro. Time-dependent convection models of mantle thermal structure constrained by seismic tomography and geodynamics: implications for mantle plume dynamics and CMB heat flux (2012).

Ayers, Paul. Time-independent density-functional theory for excited states of Coulomb systems (2012).

Kim, Philip. Tissue-Specific Alternative Splicing Remodels Protein-Protein Interaction Networks (2012).

Allen, Diana. Topographic Controls on Deep Groundwater Contributions to Mountain Headwater Streams and Sensitivity to Available Recharge (2012).

Buriak, Jillian. Toward a Mechanistic Understanding of Exciton-Mediated Hydrosilylation on Nanocrystalline Silicon (2012).

Guenther, David. TOWARD A NEW KIND OF ASTEROSEISMIC GRID FITTING (2012).

Thayyil, Jayachandran. Toward the probabilistic forecasting of high-latitude GPS phase scintillation (2012).

Groth, Clinton. Towards realizable hyperbolic moment closures for viscous heat-conducting gas flows based on a maximum-entropy distribution (2012).

Bertrand, François. Towards the simulation of the catalytic monolith converter using discrete channel-scale models (2012).

Gu, Jeff. Tracking slabs beneath northwestern Pacific subduction zones (2012).

Keeling, Christopher. Transcriptome and full-length cDNA resources for the mountain pine beetle, *Dendroctonus ponderosae* Hopkins, a major insect pest of pine forests (2012).

Chan, Hue Sun. Transition paths, diffusive processes, and preequilibria of protein folding (2012).

Bennet, Andrew. Transition State Analysis of *Vibrio cholerae* Sialidase-Catalyzed Hydrolyses of Natural Substrate Analogues (2012).

Kusalik, Peter. Transport coefficients of the TIP4P-2005 water model (2012).

Thachuk, Mark. Transport properties of the rough hard sphere fluid (2012).

Liang, Ping. Transposable Elements Are a Significant Contributor to Tandem Repeats in the Human Genome (2012).

Mosey, Nicholas. Tribochemistry of Aldehydes Sheared between (0001) Surfaces of γ -Alumina from First-Principles Molecular Dynamics (2012).

Alpas, Ahmet T.. Tribology of fluorinated diamond-like carbon coatings: first principles calculations and sliding experiments (2012).

Mousseau, Normand. Tunable magnetic states in hexagonal boron nitride sheets (2012).

Guo, Hong. Tuning the magnetic moments in zigzag graphene nanoribbons: Effects of metal substrates (2012).

Bevan, Kirk. Tuning the Surface Charge Properties of Epitaxial InN Nanowires (2012).

Lehner, Luis. Turbulent flows for relativistic conformal fluids in 2+1 dimensions (2012).

Djokovic, Dragomir. Turyn-Type Sequences: Classification, Enumeration, and Construction (2012).

Zhang, Junfeng. Two-dimensional lattice Boltzmann study of red blood cell motion through microvascular bifurcation: cell deformability and suspending viscosity effects (2012).

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Vanrolleghem, Peter. Uncertainty analysis of WWTP control strategies made feasible (2012).

O'Neil, Dugan. Underlying event characteristics and their dependence on jet size of charged-particle jet events in pp collisions at $\sqrt{s}=7$ TeV with the ATLAS detector (2012).

Ayers, Paul. Understanding chemical binding using the Berlin function and the reaction force (2012).

Mousseau, Normand. Understanding the EF-hand closing pathway using non-biased interatomic potentials (2012).

Mueller, Jens. Understanding the Reactivity of Strained Sandwich Compounds with Aluminum or Gallium in Bridging Positions: Experiments and DFT Calculations (2012).

Patey, Gren. Understanding the Structure Factor and Isothermal Compressibility of Ambient Water in Terms of Local Structural Environments (2012).

Harvey, Pierre. Unexpected evolution of optical properties in Ir-Pt complexes upon repeat unit increase: towards an understanding of the photophysical behaviour of organometallic polymers (2012).

Melko, Roger. Universal Signatures of Fractionalized Quantum Critical Points (2012).

Poulin, David. Universal topological phase of two-dimensional stabilizer codes (2012).

KIM, YONG BAEK. Universal transport near a quantum critical Mott transition in two dimensions (2012).

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Ayers, Paul. Using the spin-resolved electronic direct correlation function to estimate the correlation energy of the spin-polarized uniform electron gas (2012).

Aubé, Martin. Using two light-pollution models to investigate artificial sky radiances at Canary Islands observatories (2012).

Buriak, Jillian. UV-Initiated Hydrosilylation on Hydrogen-Terminated Silicon (111): Rate Coefficient Increase of Two Orders of Magnitude in the Presence of Aromatic Electron Acceptors (2012).

Yan, Zong-Chao. Variational energies and the Fermi contact term for the low-lying states of lithium: Basis-set completeness (2012).

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Lovejoy, Connie. Vertical distribution of microbial communities in a perennially stratified Arctic lake with saline, anoxic bottom waters (2012).

Xu, Yunjie. Vibrational absorption and vibrational circular dichroism spectra of leucine in water under different pH conditions: Hydrogen-bonding interactions with water (2012).

Xu, Yunjie. Vibrational circular dichroism spectroscopy of two chiral binaphthyl diphosphine ligands and their palladium complexes in solution (2012).

Michel, Gingras. Vindication of $\text{Yb}_{2}\text{Ti}_{2}\text{O}_{7}$ as a Model Exchange Quantum Spin Ice (2012).

Moitessier, Nicolas. Virtual Screening and Computational Optimization for the Discovery of Covalent Prolyl Oligopeptidase Inhibitors with Activity in Human Cells (2012).

Wu, Xiaohua. Visualization of Continuous Stream of Grid Turbulence Past the Langston Turbine Cascade (2012).

Boyd, Russell. Visualizing Internal Stabilization in Weakly Bound Systems Using Atomic Energies: Hydrogen Bonding in Small Water Clusters (2012).

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Alary, Michel. Vulnerability re-assessed: The changing face of sex work in Guntur district, Andhra Pradesh (2012).

Moreau, Stéphane. Wall Pressure Spectral Model Including the Adverse Pressure Gradient Effects: Application to the Prediction of Trailing-Edge Noise (2012).

Fridgen, Travis. Water binding energies of $[\text{Pb}(\text{amino acid-H})\text{H}_2\text{O}]^+$ complexes determined by blackbody infrared radiative dissociation (2012).

Pierce, Jeffrey. Weak sensitivity of cloud condensation nuclei and the aerosol indirect effect to Criegee + SO_2 chemistry (2012).

Taylor, James E.. WHAT DO DARK MATTER HALO PROPERTIES TELL US ABOUT THEIR MASS ASSEMBLY HISTORIES? (2012).

Rankin, Robert. Whistler mode wave growth and propagation in the prenoon magnetosphere (2012).

Alary, Michel. Why do condoms break? A study of female sex workers in Bangalore, south India (2012).

richards, brent. WNT16 Influences Bone Mineral Density, Cortical Bone Thickness, Bone Strength, and Osteoporotic Fracture Risk (2012).

Buriak, Jillian. Work Function Control of Interfacial Buffer Layers for Efficient and Air-Stable Inverted Low-Bandgap Organic Photovoltaics (2012).

Pharoah, Jon. X-ray computed tomography reconstruction and analysis of polymer electrolyte membrane fuel cell porous transport layers (2012).

Other

Heath, Emily. 4D Monte Carlo simulations of beam and patient motion using EGSnrc/BEAMnrc (2012).

Mahadevan, Radhakrishnan. Building a Multi-level Model Framework for Computer-aided Uranium Bioremediation Design (2012).

Mahadevan, Radhakrishnan. Building Multi-scale Mechanistic Model for Assessing Uranium Bioremediation Performance under Significantly Different Conditions (2012).

LECLAIR, Robert. Cone-Beam Computed Tomography for Breast Biopsy Analysis: Simulations (2012).

KIM, YONG BAEK. Correlated topological phases in 3D complex oxides via Green's functions (2012).

Stephen, Tamon. Counting Inequivalent Monotone Boolean Functions (2012).

Bouvier, Michel. Development and characterization of small organic modulators of arrestin functions. (2012).

Kenney, Denise. Green Space (2012).

Bouvier, Michel. Identification of small inhibitors of the AP2/_-arrestin complex that modulate GPCR internalization (2012).

Kaspi, Victoria. New Discoveries from the PALFA Survey (2012).

Nedialkov, Ned. Optimization of an Automatic Image Contouring System for Radiation Therapy (2012).

Deslongchamps, Ghislain. Reverse-docking of Sigman's Asymmetric Hetero-Diels-Alder Organocatalysts (2012).

Kenney, Denise. Soundcan (2012).

Gaskin, Susan. SPH-ALE for floating block stability and ice accumulation in open-channels (2012).

Aleksejevs, Aleksandrs. Two Photon Exchange for Exclusive Pion Electroproduction (2012).

Behjat, Laleh. What is Robust Optimization (2012).

Proceedings

Roy, René. [²⁵Na and [²⁵Mg fragmentation on [¹²C at 9.23 MeV per nucleon at TRIUMF (2012).

Simmonds, Rob. A distributed data management system for data-intensive radio astronomy (2012).

Toulouse, Michel. A Distributed p-Cycle Scheme for Protection in (2012).

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Mojahedi, Mo. A Plasmonic Affinity Biosensor with Dual Polarization Based on Hybrid Plasmonic Platform (2012).

Areibi, Shawki. A Sequential Ensemble Classification (SEC) System for Tackling the Problem of Unbalance Learning: A Case Study (2012).

Wachowiak, Mark. A Visualization Framework for Simulating Fuel Consumption Through Serious Games (2012).

Brenning, Alexander. Adding the spatial dimension to the assessment of predictive performance of and variable importance in statistical and machine-learning models (2012).

Rothstein, Stuart. Advances in quantum Monte Carlo (2012).

Ashgriz, Nasser. An Analysis of the Surface Breakup Mechanism of a Liquid Jet in Cross-flow (2012).

Dimopoulos, Nikitas. An improved neural network ensemble model of Aldose Reductase inhibitory activity (2012).

Karsten, Richard. Analysis of Tidal Turbine Arrays in Digby Gut and Petit Passage, Nova Scotia (2012).

Anderson, Jason. Analyzing and predicting the impact of CAD algorithm noise on FPGA speed performance and power (2012).

Coady, Yvonne. Autonomous Resource Consolidation Management in Clouds Using IMPROMPTU Extensions (2012).

Bremner, David. Basis enumeration of hyperplane arrangements up to symmetries (2012).

Bouchard-Côté, Alexandre. Bayesian Pedigree Analysis using Measure Factorization (2012).

Leyton-Brown, Kevin. Behavioral Game-Theoretic Models: A Bayesian Framework For Parameter Analysis (2012).

Chau, Kenneth. Broadband Optical Resonator based on Coupled Positive and Negative-Index Waveguides (2012).

Schneider, Kevin. Bug introducing changes: A case study with Android (2012).

Wang, Yang. Building a dictionary of image fragments (2012).

deChamplain, Alain. CFD Model Assessment to Simulate Turbulent Combustion in a Wood Log Stove (2012).

Gough, Kathleen. Computational modeling of the binding of Calcium and Zinc ions to Calbindin D28k (2012).

L'Ecuyer, Pierre. Constructing Adapted Lattice Rules Using Problem-Dependent Criteria (2012).

Gagnon, Langis. Content-Based Video Copy Detection Using Nearest-Neighbor Mapping (2012).

Simmonds, Rob. Data centres in the ancillary services market (2012).

Bengio, Yoshua. Deep learning of representations for unsupervised and transfer learning (2012).

Branzan Albu, Alexandra. Detection of salient events in large datasets of underwater video (2012).

Shrive, Nigel. Discrete Element Modeling of the Walls of the Prince of Wales Fort (2012).

Bengio, Yoshua. Discriminative non-negative matrix factorization for multiple pitch estimation (2012).

Rouat, Jean. Discriminative sparse-based feature extraction and dictionary learning for sound classification applications (2012).

Renksizbulut, Metin. DSMC simulation of H₂ - Air mixtures in micro/nano-channels undergoing oxidation on platinum coated walls (2012).

Zhang, Kaizhong. Efficient Filtration for Similarity Search with Spaced k-mer Neighbors (2012).

Bowling, Michael. Efficient Nash Equilibrium Approximation through Monte Carlo Counterfactual Regret Minimization (2012).

Areibi, Shawki. Efficient On-line Hardware/Software Task Scheduling for Dynamic Run-time Reconfigurable Systems (2012).

Chen, Yongsheng. Ensemble prediction for a severe weather event: A study of the 2009 southern Ontario storm (2012).

Wang, Liangliang. Entangled Monte Carlo (2012).

Bouchard-Côté, Alexandre. Entangled Monte Carlo (2012).

Aubanel, Eric. Finding Common RNA Secondary Structures: A Case Study on the Dynamic Parallelization of a Data-driven Recurrence (2012).

Bowling, Michael. Finding Optimal Abstract Strategies in Extensive Form Games (2012).

Dufresne, Louis. Flow around a square-section cylinder using k-omega SST delayed detached-eddy simulation (2012).

Szafron, Duane. Generalized Sampling and Variance in Counterfactual Regret Minimization (2012).

Massicotte, Daniel. Genetic algorithm optimization for codewords correction in MIMO broadcast channels (2012).

Simmonds, Rob. Green cloud VM migration: Power use analysis (2012).

Skorek, Adam. HPC approach to thermal analysis of graphene-based single electron transistor (2012).

Anderson, Jason. Impact of Cache Architecture and Interface on Performance and Area of FPGA-Based Processor/Parallel-Accelerator Systems (2012).

Rusch, Leslie. Impact of MCMC convergence behavior on MMC parallelization (2012).

Chen, Yongsheng. Impact of turbulence length scales on numerical forecasts of Hurricane Earl (2010) (2012).

Renksizbulut, Metin. Improving DSMC inlet/outlet boundary conditions for gas mixtures using the Chapman-Enskog distribution (2012).

Milios, Evangelos. Interactive Learning of Alert Signatures in High Performance Cluster System Logs (2012).

Bowling, Michael. Investigating Contingency Awareness using Atari 2600 Games (2012).

Bengio, Yoshua. Joint learning of words and meaning representations for open-text semantic parsing (2012).

Bengio, Yoshua. Large-scale feature learning with spike-and-slab sparse coding (2012).

Bengio, Yoshua. Modeling temporal dependencies in high-dimensional sequences: Application to polyphonic music generation and transcription (2012).

Smucker, Mark. Modeling user variance in time-biased gain (2012).

Chao, Yu-Chiu. Multi-Code Modelling of Momentum Collimation in the TRIUMF ARIEL Linac (2012).

Gagné, Christian. Multi-objective evolutionary optimization for generating ensembles of classifiers in the ROC space (2012).

Leung, Victor. Optimal transmission strategy for a secondary user in IEEE 802.11 based networks (2012).

Goldberg, Ian. Optimally Robust Private Information Retrieval (2012).

Toulouse, Michel. p-Cycle Based Protection Mechanisms in Optical (2012).

Leyton-Brown, Kevin. Parallel Algorithm Configuration (2012).

Behjat, Laleh. Parallel Clock Tree Synthesis (2012).

Dehne, Frank. Parallel Real-Time OLAP on Multi-core Processors (2012).

Dufresne, Louis. Partial reconnection of orthogonal vortices (2012).

Berini, Pierre. Plasmonic dipole antennas on silicon (2012).

Michaud, Francois. Pose refinement using ICP applied to 3-D LIDAR data for exploration rovers (2012).

Leyton-Brown, Kevin. Predicting Satisfiability at the Phase Transition (2012).

Driver, Robert. Progressive Collapse Resistance of Steel Gravity Frames Considering Floor Slab Effects (2012).

Szpunar, Barbara. Properties of Recycled Fuels; Density Functional Theory Study (2012).

Goita, Kalifa. Radar altimetry of water level variability in the Inner Delta of Niger River (2012).

Brenning, Alexander. Räumliche Modellierung von geographischen Verbreitungsmustern mit innovativen Methoden der Statistik und des Maschinellen Lernens (2012).

Mehravaran, Kian. Rayleigh-Taylor Instability in Disintegration of Liquid Globule due to Constant Acceleration (2012).

Leung, Juliana. Scale-up of Effective Mass Transfer in Vapor Extraction Process for Heterogeneous Reservoirs (2012).

Levi, Ofer. Self-Referenced Photonic Crystal Biosensors for in situ Binding Studies (2012).

Chen, Yongsheng. Sensitivity of hurricane forecasts to boundary layer turbulence parameterization (2012).

Mojahedi, Mo. Shape-Optimized Electromagnetic Absorber with Maximized Heat Transfer to the Surrounding (2012).

gras, robin. Simulating Vaccination Control and Herd Immunity Threshold in EcoDemics (2012).

Azaiez, Jalel. Simulation of Miscible Cyclic Injection Flows in Porous Media (2012).

Smucker, Mark. Stochastic simulation of time-biased gain (2012).

gras, robin. The Emergence of New Genes in EcoSim and its Effect on Fitness (2012).

Chao, Yu-Chiu. THE TRIUMF OPTIMIZATION PLATFORM AND APPLICATION TO THE E-LINAC INJECTOR (2012).

Johnston, Clifton. The Use of CFD to Understand Thermal Environments Inside Roman Baths: A Transdisciplinary Approach (2012).

Wachowiak, Mark. The Viability of Global Optimization for Parameter Estimation in Spatial Econometrics Models (2012).

Azaiez, Jalel. Thermo-Viscous Fingering in Heterogeneous Media (2012).

Smucker, Mark. Time-based calibration of effectiveness measures (2012).

Noel, Martin. Toward optimizing static target search path planning (2012).

Bengio, Yoshua. Unsupervised and transfer learning challenge: a deep learning approach (2012).

Dimopoulos, Nikitas. Using indirection to minimize message delivery latency on cache-less many-core architectures (2012).

Fischmeister, Sebastian. Using link-level latency analysis for path selection for real-time communication on NoCs (2012).

gras, robin. Using Machine Learning Techniques for Identifying Important Characteristics to Predict Changes in Species Richness in EcoSim (2012).

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Bowling, Michael. Variance Reduction in Monte Carlo Tree Search (2012).

Technical Reports:

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Thesis:

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APPENDIX B: TECHNICAL CONTRIBUTIONS

SOFTWARE OUTCOMES

Name	Description
Sarkar	* Kriya. https://github.com/sfu-natlang/Kriya * Semi-supervised learning of natural language. https://github.com/sfu-natlang/yarowsky Information mining from wikipedia and text visualization. http://lensingwikipedia.cs.sfu.ca/
Bielawski	1. BiomeNet (A Bayesian model for measuring metabolic divergence among microbiomes) 2. BioMico (A Bayesian model for estimating differences in the community structure of micorbiomes)
Chen	1. Boreal Ecosystem Productivity Simulator (BEPS) 2. Integrated Terrestrial Ecosystem Carbon Model (InTEC)
Behjat	1. Gate-sizing for deep submicron circuits, Released at International Symposium on Physical Design Competition, A. Farshidi, L. Rakai, L. Behjat, D. Westwick, March 2013 2. 2. Analog Design Assistant Tool, D. Shahhosseini, L. Behjat, I. Belototski, 2012
Abukhdeir	1) FCGram software package, solver based upon spectral methods for solving partial differential equations in heterogenous computing environments.
Ilie	10.1016/j.ejc.2012.07.011
Lartillot	2 software programs:PhyloBayes MPI (Lartillot et al, Systematic Biology, in press) Coevol (Lartillot and Poujol, 2011 Mol Biol Evol, 28:729) (www.phylobayes.org)
Bengio	2: Theano: http://deeplearning.net/software/theano/ Pylearn2: http://deeplearning.net/software/pylearn2/
Sykes	A 3D Computer Assisted Treatment Planning System for Breast Cancer
Mehravaran	A Cartesian mesh, adaptive, fully compressible, and parallel Navier-Stokes solver with extremely high efficiency has been developed last year.
Wolf	a computer algebra package sqlinsolve. red for solving extremely large sparse linear systems symbolically
Qureshi	A distributed virtual vision simulator (http://faculty.uoit.ca/qureshi/projects/vvs/index.html)
Dibike	A Hydrological modeling System for the Athabasca Watershed
Sorkin	A large suite of new lisp programs (functions and macros) for working with partial orders, the physics applications being causal sets (quantum gravity) and anhomomorphic coevents (quantum foundations)
Menzinger	A neural network model of Epilepsy is being analyzed.
Carrington	A new program for computing rovibrational spectra
Wagner	A note about work accomplished with the help of WestGrid http://www.mpich.org/2013/01/15/over-100-million-processes-with-mpich/ and also an article in HPC-Wire http://www.hpcwire.com/hpcwire/2013-01-15/british_columbia_researchers_notch_milestone_in_pursuit_of_exascale_computing.html WestGrid News Write-up A Signpost on the Road to Exascale: UBC Researchers Use WestGrid to Explore Exascale Computing https://www.westgrid.ca/westgrid_news/2013-01-14/ubc_researchers_use_westgrid_explore_exascale_computing
Wu	A program for dynamic analysis of legged walking robots have been developed and used for our group's research. We plan to make it a stand-alone software for research use.
Ashgriz	A software that can simulate atomization of a liquid jet in cross flow using large eddy simulation is developed.
Côté	ABINIT
Zwanziger	ABINIT: I am one of the current developers of the ABINIT code, a Gnu GPL-licensed package for computing properties of materials from first principles. See www.abinit.org for

	a complete description and to download.
Greenwood	adaptive mesh algorithms
Doxey	AFPredictor, cbsPredict, COMPLEX
McGuigan	AJAX Web Scraper. A java tool to scrape the contents of AJAX-generated web pages: http://vancouverdata.blogspot.ca/2012/02/less-painful-ajax-javascript-web.html
Beaulieu	ALGEBRA dose calculation platform (using the Geant4 toolkit)
Melko	All software can be seen on https://github.com/rgmelko - 1D numerical linked-cluster expansion - Graph generation on a 2D square lattice - Spin models on GPUs - C++ implementation of DMRG algorithm
Moghadas	An agent based model of influenza spread within a remote northern Canadian community
van Beek	An implementation of the constraint programming approach to superblock instruction scheduling for realistic multiple-issue processors; an implementation of the algorithm for bounds consistency propagation of the alldifferent and gcc constraints.
Stroman	Analysis software for functional MRI of the spinal cord
Ward	Analysis software for wave parameter determination in all sky airglow images. Analysis software of data from a Martian general circulation model. Analysis software for a wind measuring satellite.
Arppe	Antti Arppe (2012). polytomous: Polytomous logistic regression for fixed and mixed effects. R package version 0.1.4. http://CRAN.R-project.org/package=polytomous Antti Arppe, Petar Milin, R. Harald Baayen and with contributions from Peter Hendrix (2012). ndl: Naive Discriminative Learning. R package version 0.1.6. http://CRAN.R-project.org/package=ndl
Diallo	Armadillo 1.0, Ancestors 1.1,
Eagleson	Augmented reality simulator
Arbel	Automatic head pose estimation from real-world video sequences is of great interest to the computer vision community since pose provides prior knowledge for tasks, such as face detection and classification. However, developing pose estimation algorithms requires large, labeled real-world video databases on which computer vision systems can be trained and tested. Manual labeling of each frame is tedious, time consuming, and often difficult due to the high uncertainty in head pose angle estimate, particularly in unconstrained environments that include arbitrary facial expression, occlusion, illumination etc. To overcome these difficulties, a semi-automatic framework was developed for labeling temporal head pose in real-world video sequences. The proposed multi-stage labeling framework first detects a subset of frames with distinct head poses over a video sequence, which is then manually labeled by the expert to obtain the ground truth for those frames. The proposed framework provides a continuous head pose label and corresponding confidence value over the pose angles. Next, the interpolation scheme over a video sequence estimates i) labels for the frames without manual labels and ii) corresponding confidence values for interpolated labels. This confidence value permits an automatic head pose estimation framework to determine the subset of frames to be used for further processing, depending on the labeling accuracy required. The experiments performed on an in-house, labeled, large, real-world face video database (which will be made publicly available) show that the proposed framework achieves 96.98 % labeling accuracy when manual labeling is only performed on 30 % of the video frames.
Rubel	BerryPi
Lina	BEsT (Brain Entropy in space and Time)
Giroux	bh_tomo; pve_vti_pml; pve_iso_pml

Baillet	Brainstorm (neuroimage.usc.edu/brainstorm) is an academic software application for advanced MEG and EEG data analysis and functional imaging. My group has contributed methods and thousands of lines of code to this project, which I initiated with collaborators at the University of Southern California and at the Cleveland Clinic in 1999. Since then, the software has grown tremendously in sophistication and popularity: a full-time software engineer has been hired in 2007 to work on the project and more than 7,100 downloads have been registered since 2000. More than 150 scientific articles have been contributed from users and developers. Recently, I have organized training sessions in Canada (McGill, UQAM), France (SupTelecom) and the USA (MIT), which gathered 400+ attendees from around the world, to foster transfer to knowledge users.
Brenning	Brenning, A. 2012. Sperrorest: Spatial error estimation and variable importance. R package, available online from the Comprehensive R Archive Network at http://cran.r-project.org/
Noskov	BROMOC3.1, a program for simulations of ion and DNA dynamics in nanopores
Schnetter	Cactus: http://cactuscode.org Carpet: http://carpetcode.org Einstein Toolkit: http://einstein toolkit.org ffSimulation Factory: http://simfactory.org
Swan	Canadian Hybrid Residential End Use Energy and GHG Emissions Model (CHREM)
Karttunen	CASHEW: http://www.softsimu.org/downloads.shtml
Laurendeau	CFD codes
Salcudean	CFD multiphase flow licensed to PSL a UBC spin-off company
Groth	CFFC: The Computational Framework for Fluids and Combustion's (CFFC) is an in-house computer software and/or research code developed by Groth's research group. CFFC is a package of subroutines for solving fluid dynamics and combustion problems using numerical methods and high-performance computing systems. The computational framework includes a parallel, implicit, AMR, finite-volume, discretization scheme for the solution of the compressible form of the Navier-Stokes equations governing multi-species reactive flows on both two- and three-dimensional domains using multi-block body-fitted mesh with treatment for detailed and reduced chemical kinetics, radiative heat transfer, soot formation and oxidation, and unsteady flame dynamics. Favre-averaged and Favre-filtered variants of the Navier-Stokes equations with appropriate modelling for the unresolved and subfilter-scale turbulence and turbulence-chemistry interactions can also be solved for performing both RANS- and LES-based simulations of premixed and non-premixed turbulent combusting flows. This computational framework will provide the basis for the research outlined in this allocation request. The CFFC software has already been implemented and used on both the SciNet Tightly Coupled System (TCS) and General Purpose Cluster (GPC) facilities and its parallel performance is discussed in a number of the references/publications given in the review of progress to follow.
Thomson	CFlame
Winslow	Computational Model for Cerebral Blood Flow/Metabolism
Roger	CONCATERPILLAR FUNDI
Wang	CONTAM, CONTAM97R, CFD0, COSMO
Poirier	Continued development of MUNgauss
Salahub	Continued updates to the deMon2k molecular modeling software
Thomas	Contributed to "Panseq" (http://lfz.corefacility.ca/panseq/) which was produced in collaboration with Dr. Vic Gannon of the Public Health Agency of Canada and Chad Laing (PhD Graduate Student)
Waldispuhl	CreateFibril (http://amyloid.cs.mcgill.ca/)
Shah	Currently working on simulation to test EnKF algorithms.
Ward	Custom Matlab scripts to perform compute-intensive analyses of EEG/MEG data.
Passi	Data Integration system; Decision Support System for Colorectal Cancer Follow-up program
Chakravarty	Deformation based morphometry algorithms
Frolov	DEFROST http://www.sfu.ca/physics/cosmology/defrost/
Mueller	Depth-first UCT for parallel Monte Carlo Tree Search (under development). Implemented in the Fuego framework, http://fuego.sourceforge.net/
Gauthier	Development and implementation of variational data assimilation systems, 3D-Var (1997)

	and 4D-Var (2005), for the Meteorological Service of Canada that owns the software. It is still used to produce the meteorological analyses by MSC.
Zingg	diablo (CFD) jetstream (aerodynamic shape optimization)
Otto	diversitree (package in R)
Goldberg	DKG (distributed key generation), cudadl, BridgeSPA, Sphinx, Percy++, Off-the-Record Messaging (OTR)
Guthrie	DONBT, a set of programs to calculate rate constants for chemical reactions by No Barrier Theory
Hamilton-Wright	DQEmgBridge: link between existing DQEMG program and the Sierra Wave II
gras	EcoSim
Krems	Efficient method for quantum calculations of molecule - molecule scattering properties in a magnetic field
Deslongchamps	EM-Dock: reverse-docking program, runs within the Molecular Operating Environment (MOE, Chemical Computing Group, Inc.) GI-MOE: Gaussian interface for MOE, runs within the Molecular Operating Environment (MOE, Chemical Computing Group, Inc.) Post-Dock: a program for the visualization of molecular docking results, runs within the Molecular Operating Environment (MOE, Chemical Computing Group, Inc.)
John	EMTL MicroVolt
Ternovska	Enfragmo system
Tsanis	Environmental software development: MSBC: Multi-Segment statistical Bias Correction model (2013); WRDA-SEA: A Weather Radar Data Processing Module for Storm Event Analysis (2012)
Charbonneau	EULAG-MHD
Schurr	FBAT-dosage
Shipley	FD package in R
Fafard	FESh++
Laprise	Fifth-generation Canadian Regional Climate Model (CRCM5)
tanaka	fiTQun: new reconstruction algorithm for Super-Kamiokande and other water cherenkov detectors
secanell	Fuel Cell Simulation Toolbox (FCST)
Starosta	GEANT4 radiation transport code for a neutron generator laboratory at Simon Fraser University GEANT4 simulation of shielded, high-resolution, photon detector (HpGe) for environmental and radioactivity studies.
Chen	genBlastA, genBlastG, OrthoCluster, OrthoClusterDB, CooVar
Trépanier	Geometric parameterization of fan blades Far-field Drag decomposition for full aircraft
Chao	Global optimization program based on parallelized genetic algorithm for design of accelerator and beam transport systems of arbitrary configuration topology.
Després	GPUMCD (see publications), licensed to IMPAC Medical Systems
Fan	grid/cloud based reconfigurable computing platform
Gerhard	GW-VAP3D: A 3D coupled groundwater-vapour contaminant transport model for studying the implications of industrial subsurface pollution on the risk to receptors in the neighbouring community
Molson	Heatflow, BioNAPL, Flonet
Goodenough	http://rseng.cs.uvic.ca/publications.html link to publications. SAFORAH CGS - System of Agents for Forest Observation Research with Advanced Hierarchies - Computational GRID System. Classifiers, pattern recognition methods for hyperspectral analysis; pattern recognition methods for polarimetric radar analysis and decompositions.
Morozov	http://seisweb.usask.ca/igeos/index.html
Bouchard-Côté	http://www.stat.ubc.ca/~bouchard/GEP/
Chen	Idefics Dynamic
Munroe	igwtools
Aubé	ILLUMINA light pollution model AODSEM particulate transport model SAND spectrometer software package
Sloan	Image analysis software described in T. Kuhn, I. Grishin, J. J. Sloan, "Improved Imaging

	and Image Analysis System for Application to Measurement of Small Ice Crystals"
Demirov	Implementation of Global Ocean Model with two-ways nested high-resolution model of the Nordic Seas. Implementation of North Ocean Model with two-ways nested high-resolution model of the Labrador Sea
Lewis	In house statistical analysis.
Habashi	In-flight icing simulation software
Crawford	In-house coupled aerodynamics & structures code for wind turbine multidisciplinary optimization
Brinkman	InnateDB, MicrobeDB, IslandViewer, Allergy and Asthma Portal
Soulet	Intravital imaging Toolbox (macro programme pour le logiciel ImageJ)
Najmanovich	IsoMIF
Peng	JMTT, an R package for joint modeling of longitudinal measurements and survival times with a cure fraction
German	Joa: http://github.com/dmgerman/joa
Zuckermann	Langevin dynamics numerical simulation for multipedal synthetic protein nnomotor models. Monte Carlo numerical simulation for coupled synthetic molecular nano-motors.
L'Ecuyer	Lattice Builder: http://www.iro.umontreal.ca/~simardr/latbuilder/latbuilder.html ContactCenter: http://www.iro.umontreal.ca/~simardr/contactcenters/index.html SSJ: http://www.iro.umontreal.ca/~simardr/ssj/indexe.html
Anderson	LegUp high-level synthesis framework was partially created using Compute Canada resources: www.legup.org
Duncan	LIPAD - a Lagrangian Integrator for Planetary Accretion and Dynamics
Newman	LMERConvenienceFunctions: A suite of functions to back-fit fixed effects and forward-fit random effects, as well as other miscellaneous functions (http://cran.r-project.org/web/packages/LMERConvenienceFunctions/index.html)
Li	LoopWeaver
Kaplan	LPJ-LMfire parallelized dynamic global vegetation model
Harrison	LPS-Annotate compositional bias analysis server (http://libaio.biol.mcgill.ca/lps-annotate.html)
Van Houten	Magnetic Resonance Elastography Subzone Image Reconstruction Multi-Scale Cell Mechanics Model
Marchand	Many learning algorithms for constructing predictors from data.
Yau	Mars ionosphere simulation code created
Gebali	matlab for video compression
Mongeau	MCAAP (McGill Computational Aeroacoustics Package) (Acoustic analogy)
Lerch	MICe-build-model: registration software for MRI scans MAGeT: segmentation software for MRI scans
Evans	Minc format and Toolkit, CBRAIN Distributed Collaborative Platform, BrainBrowser 3D Web Viewer, LORIS Multi-Site Study Database.
Schreckenbach	Minor contributions to the ADF code (http://www.scm.com)
Muir	MIRKDC (F77): Runge-Kutta Software for the numerical solution of boundary value ordinary differential equations with defect control, 1996 BVP_SOLVER (F95): Runge-Kutta Software for the numerical solution of boundary value ordinary differential equations with defect and global error control, 2012 BACOL (F77): Collocation Software for the numerical solution of 1D parabolic partial differential equations with spatial and temporal error control using backward differentiation formulas, 2004 BACOLR (F77): Collocation Software for the numerical solution of 1D parabolic partial differential equations with spatial and temporal error control using a Runge-Kutta formula, 2008 BACOLI (F77): Collocation Software with Interpolation-based Spatial Error Control for the numerical solution of 1D parabolic partial differential equations, 2012
Lister	Model of localised corrosion in a nozzle-inserted tube.
Galanis	Models for ice rinks and ejector refrigeration systems
Larsson	modifications to BEAST, RAXML, and Mr.Bayes
Myers	Modifications to NEMO ocean /sea-ice general circulation model. Fortran and matlab

	analysis and visualization scripts.
Haljan	Molecular dynamics simulation code has been written in MATLAB to investigate non-equilibrium dynamics of trapped arrays of atomic ions. The simulations have been used to compare to experiments measuring topological defect formation following a quench across the linear-zigzag structural phase transition.
Baroud	Most related to PhD studies for micro-structural analysis of bone substitute
Chen	Multiscale ensemble data assimilation system
Kim	MUSI -- see publication
Jeon	MUSIC and MUSIC with UrQMD Afterburner. Both are relativistic heavy ion collision simulators.
Lu	Nahanni system for Linux KVM, known in the mainline as ivshmem.
Wartak	NEGF simulator of semiconductor lasers
Eliasmith	Nengo
Rutherford	NepidemiX - Software package for modelling diseases processes on networks. See: http://nepidemix.irmacs.sfu.ca NepidemiX is published under the modified BSD license. It may be downloaded from the above website.
Tieleman	New analysis software for membrane simulations
Betz	New flow to generate large benchmarks, and a new much larger and more realistic suite of benchmark circuits, to test FPGA CAD software and new architectures. Publication in preparation for the IEEE Int. Conf. on Field Programmable Logic and Applications.
Forman-Kay	new version of ENSEMBLE
Marshall	No commercial code. Only research software, for glacier, ice sheet, and glacier-climate modelling.
Wachowiak	Non-commercial web-based research system for visualization and agricultural decision support. Supported by NOHFC grant above.b http://geovisage.nipissingu.ca
Cardille	None that is commercialized. Only in-house software
Ray	NSGA program
Rankin	Numerous computer models describing space plasma interactions in solar system plasmas
Cronk	Numerous custom scripts in perl and R
Lu	Ocean circulation and sea-ice models based on NEMO for global, North Atlantic, Arctic and Northwest Pacific Oceans based on NEMO (Nucleus for European Modelling of the Ocean)
gray	OFR-AT : Analysis tool for extracting potentials of mean force from force samplings obtained from non-equilibrium molecular dynamics simulations, developed by graduate student Bryan Holland (http://dx.doi.org/10.1016/j.jcp.2012.02.018).
Tomberli	OFR-AT v1.0
Bayne	Online database system reporting bird density from models created for entire North American continent www.borealbirds.ca
Pharoah	Open Source multi-scale software suite built on OpenFoam for Solid Oxide Fuel Cell modelling
Brown	OrlandoVision, or OVis, is a tool used to leverage semantic XML tags in text corpora to visualize connections between persons according to the type of relationship.
soulez	ORS
van Veen	PAMPAC, MFM
Halevy	Parametric recoverability toolkit (in development)
Hoos	ParamILS (UBC UILO), SMAC (UBC UILO)
Banks	Paul D. McNicholas, K. Raju Jampani, Aaron F. McDaid, T. Brendan Murphy and Larry Banks (2011), "pgmm: Parsimonious Gaussian Mixture Models", R package version 1.0.
Liang	pBWA
Zhang	Phenom.cabr.utoronto.ca RIP-Seeker
Droit	PICS, rGADEM, rTANDEM, MoTIV
Bénard	PIGCMC-Sim
Kusalik	PIIKA, DAPPLE, SAPHIRE
Bellec	Pipeline system for Octave and Matlab https://code.google.com/p/psom/ Neuroimaging Analysis Kit https://code.google.com/p/niak/

Sheng	Platform of fully coupled Comsol multiphysics radio-frequency and structural mechanics modules for computing the cell deformation in dual-beam optical tweezers
Tarasov	plenty has been created for inhouse use, but none has been commercialized
Boucher	Plug-in for Geneious
Bowling	Polaris: Limit Texas Hold'em Player Polaris: No-Limit Texas Hold'em Player Arcade Learning Environment
Beaulieu	Postdoctoral fellow is developing software to enable the measurement of diffusion magnetic resonance imaging (MRI) parameters along the length of white matter tracts in the human brain.
Becke	postG.f (for the addition of dispersion energies and forces to GAUSSIAN03 computations)
Fortin	Poursuite du développement de notre logiciel d'éléments finis maison appelé MEF++.
Bhiladvala	Programs for Steady and unsteady CFD calculations for turbulent wall shear stress probes.
Yevick	proprietary software pertaining to optical system simulation
Marchand	Ptetra This is a PIC simulation that I developed to simulate satellite-space environment interaction, and that I also use to simulate laboratory plasma interaction. This model is continually being improved and enhanced.
Austin	Python code for tracking clouds in large eddy simulations: https://github.com/phaustin/cloudtracker
Peterman	R code to conduct the Monte Carlo simulations reported in the Dorner et al. manuscript that is still under review at the journal, Fisheries Research.
Gel	R package <code>npard</code> : Nonparametric Analysis of Longitudinal Data in Factorial Experiments, http://cran.r-project.org/web/packages/npard/index.html R package <code>lawstat</code> : A new R package for biostatistics, public policy and law, http://stat.ethz.ch/CRAN/src/contrib/Descriptions/lawstat.html
Bureau	R package <code>LCAextend</code>
Coady	Ran Mahout for data analysis, but not software created other than testing.
Corbeil	Ray, Ray meta. Ray cloud Browser
Ling	Recommendation systems Big Data Analytics
Mostaghimi	RF plasma simulation software
Robertson	Rigaudon, Polytonic Greek OCR https://github.com/brobertson/rigaudon
Yu	Rmpi: R package. One of two cores packages defined by High-Performance and Parallel Computing with R Community. Rmpi is used on SHARCNET for MPI statistical computing. pbdMPI: R package with a focus on Single Program/Multiple Data (SPMD) parallel programming style. parspatstat: R package for parallel spatial statistics
Ziegler	RSCF-CV-DFT for the calculation of excitation energies in molecules. A module in the Amsterdam Density Functional package distributed by Scientific Computing and Modeling
Nair	SAOlib: a library for surrogate-assisted design optimization
Gagné	SCHNAPS : https://code.google.com/p/schnaps/ DEAP : https://code.google.com/p/deap/
Gu	Seismic Digital Processing Softwares (for UofA students and Faculty) Seismic Radon Transform Method (downloadable at journal software depository of Computers and Geosciences)
Rogan	Shannon pipeline for human mRNA splicing mutation analysis (patented, commercialized) Automated Splice site and exon definition analysis (patent pending, commercialized) Automated dicentric chromosome identifier (patent pending)
Tyson	Simulation software for random walks on circular or rectangular domains. The software is described in the MSc thesis of Alexander Blaessle (in progress).
Hudson	Simulations of weak lensing around satellite galaxies in groups
Renksizbulut	Software developed for DSMC simulations of rarefied reacting flows in micro/nano channels.
James	software for computing glacial isostatic adjustment (GIA) continues to be improved and updated.
Sarkar	software for large-scale stochastic PDE simulation software for data assimilation for large-scale stochastic PDE
Yeung	Software for modelling sedimentation of nano-particles in non-aqueous liquids

Boisvert	Software: Ray Platform, Ray (Ray Meta), Ray Cloud Browser
Rocheffort	SPAGS-STM, Flex-STM, HPN (Hybrid Percolation Network)
Tse	Structural prediction with evolution algorithm (with former student Dr. Y. Yao)
Donovan	synchronization routines to manage the accuracy of our primary and secondary data sets
Makarenkov	T-Rex: a web server for inferring, validating and visualizing phylogenetic trees and networks (available at: www.trex.uqam.ca)
Trescases	The Compute Canada resources have proved crucial to Blue Sky Solar Racing project where the students get a chance to design, build and race solar vehicles. The compute servers were primarily used to run ANSYS CFX that determined the aerodynamic drag of the designed solar vehicle. The server allowed us to run the analysis at 2-3 times the speed of a regular desktop machine and it also allowed us to run multiple runs of ANSYS software concurrently, speeding up the design process even more. We are in the process of gathering further aerodynamic drag results using the compute servers for developing an accurate strategy for the upcoming race in October.
Moitessier	The Forecaster platform: FITTED, Prepare, Process, Smart, Convert, Select, Reduce, React, Finders, Impacts, ACE.
Levesque	The genome typing by sequencing IBIS pipeline
Hore	Tools for the modelling of peptide structures in solution and at surfaces. Tools for predicting IR, Raman, and SFG spectra of these molecules. Grid computing tools for managing the above tasks.
Santos	UNB Ray-tracer UNB-VMF1 service
Inal	User Defined Material Subroutines (UMATs) for various softwares
Foreman	versatile harmonic tidal analysis package
Paus	Volumetric analysis pipeline
Irons	We are developing software for CFD calculations in steelmaking; student is progressing well, and will be presenting his first conference paper in May.
Coulombe	We are in the process of developing a parallel program for nanofluids simulations at the microscopic scale. The use of the Compute Canada infrastructure has been paramount in this developing stage. The hybrid model being developed uses the Lattice Boltzmann Method (LBM) to describe the fluid and the fluid-particle interactions, while the Finite Element Finite Volume method is used describe the conservation equations for energy and species. The model development stage has been completed and we are currently validating the model.
Wodak	We created MRR (Multiple Replica Repulsion) algorithm for sampling conformational landscapes of complex biological systems (protein-ligand in explicit water). The software was developed as a pug-in to the CHARMM package.
Lignos	We developed a unix-based software for finite element simulation of frame structures.
Beaumont	We have been modifying the software Douar a 3D finite element program for fluid creeping flows
Militzer	We have been working for over 12 years on the development of an in house Computational Fluid Dynamics software named the Numerical Wind Tunnel. Recently improvements allow for the accurate prediction of flow velocities in the boundary layer around solid objects. This work is part of the MASc thesis of Mr. Fang Gao.
Christensen	We have developed a first and very data-intensive model of life in the global ocean. Will be published during 2013
Clarke	ZEUS-3D, version 3.6 AZEuS

Collaborations

PI Last Name	Description
Stanley	Collaborations with researchers at MIT, Caltech, and Harvard University.

Eikerling	German-Canadian collaboration program in fuel cell research- Pan-Canadian network on Catalysis Research for Polymer Electrolyte Fuel Cell- APC project on membrane degradation- NSERC CRD project on catalyst layer degradation with AFCC- NSERC SPG project on design and fabrication of ultrathin catalyst layers with partners at SFU, Queen's, U Alberta, AFCC, Ballard - industrial collaborations with AFCC, Ballard, Nissan, Cadex, Ford, Daimler
Babul	(1) Modeling Evolution of Satellite Galaxies: Lucio Mayer (Zurich),(2) Formation and Evolution of Groups and Clusters of Galaxies: Romeel Dave (Capetown), Neal Katz (UMass), Tom Quinn (UWashington), (3) Impact of Black Hole Feedback on Galaxies, Groups and Clusters: Andrew Benson (Carnegie Obs.)
Schade	The Canadian Advanced Network for Astronomy Research (CANFAR) and the Canadian Astronomy Data Centre (CADC) are partners or collaborators with most major astronomy data centres in the U.S., Asia, Australia, and Europe. CANFAR/CADC manage data under contract,MOU, or other agreement with international observatories, the Gemini Observatories, the Canada-France-Hawaii Telescope, the James Clerk Maxwell Telescope, the Hubble Space Telescope, and other facilities and projects.
Zhang	1 Numerical Investigation of the Flow Fields within Compact Compressors with Pratt and Whitney Canada, Mississauga, ON 2. Computational Flow Dynamic Analysis of Air Distribution in Biofilters and Biotrickling Filters with BIOREM Technologies Inc., Guelph, ON 3. Development of Numerical Models for Fluid Flow and Mass Transfer in an SCFB Ion-Exchange System with Renix, London, ON 4. CFD Analysis of Free Surface Effects in Open Channel UV Reactors with Trojan Technologies, London, ON
Attia	1- Industrial collaboration with Pratt& Whitney Canada; modeling of machining-induced residual stresses.2- International Industrial Collaboration with Tecnolub Systems; CFD modeling of mist flow. 3- International industrial collaboration; modeling of composites machining.
Plettner	1. With the Canadian Forest Service 2. With a researcher in Israel 3. With a researcher in Prince George, B. C. 4. With a colleague at SFU (Biological Sciences) 5. With a colleague at SFU (Chemistry) 6. With a colleague at TWU and SFU (Chemistry)
Shaw	1. Collaboration with UPPA Department of Chemistry on intermolecular vibration mode identification in crystals. Participants include Prof. Isabelle Barialle and Dr. Didier Begue (UPPA, France) and Prof. J. M. Shaw and Dr. Faustine Spillebout (UofA, Canada) 2. Collaboration with UPPA Department of Applied Physics on real-time two dimensional mapping of flow and composition in porous media. Participants include Prof. Jean-Luc Daridon (UPPA France) and Prof. J. M. Shaw and Dr. Marc Cassiede (UofA, Canada)
Krzymien	1. TELUS Communications. 2. Huawei Technologies. 3. German Aerospace Center, Institute of Communications & Navigation, Oberpfaffenhofen, Germany. 4. Department of Information Engineering, University of Padova, Padua, Italy.
Dionne	École Polytechnique (Paris), Temple University (Philadelphia).
Hopkins	AB Sciex Dr. Staurt Mackenzie, University of Oxford
Rogers	ADF Group Inc, Terrebonne QC
bohle	ADF groupe inc.
Gervais	Adrian Del Maestro, University of Vermont
Gosselin	Alcoa, SNC-Lavalin, Hatch, BPR-Tetra tech, Société d'habitation du Québec, etc.
Steffan	Altera Toronto
Yudin	AstraZeneca, Merck, Pfizer, GlaxoSmithKline
Tafirout	ATLAS experiment at the Large Hadron Collider (LHC), http://atlas.web.cern.ch Worldwide LHC Computing Grid, http://wlcg.web.cern.ch
Pinfold	ATLAS, MoEDAL, SLIM
Skorek	Bombardier Aerospace Polish-Japanese Institute of Information Technology (Poland) Bialystok University of Technology (Poland) Silesian University of Technology (Poland)
Walker	Ca' Foscari University of Venice
Cowen	Caleb Gardner, University of Tasmania; Byron Morgan, University of Kent; Takis Besbeas, University of Kent

Broderick	CDC Neurotoxicology Laboratory, US Veterans Affairs Medical Center - Miami, University of Miami
Deza	Chair of the Fields Institute Industrial Optimization Seminar Series
Chen	China University of Petroleum, Computer Modelling Group Ltd.
Wen	CMC project in collaborations with Heriot-Watt University Biofuel Net project in collaborations with Dr. Ngoc Ha
Pfeiffer	Collaboration to Simulate extreme Spacetimes (SXS). Cornell University, California Institute of Technology, Fullerton University, University of Washington.
Li	Collaboration with Harbin institute of Technology, US Department of Energy
Minev	Collaboration with a group in the Fraunhofer Institute for Industrial Mathematics, Kaiserslautern, Germany (started in 2011). Collaboration with a group in the Department of Chemical Engineering, Institute of Chemical Technology, Mumbai, India (started in 2009). Industrial collaboration with Larichina Energy, Calgary (just starting).
Guglielmo	Collaboration with Bird Stadies Canada through a MITACS doctoral fellowship for Tara Crewe
Schafer	Collaboration with Computational Laboratory of Montpellier University/CNRS
Vengallatore	Collaboration with Cornell University, USA, for the design of high-Q nanomechanical resonators for hybrid quantum systems.
Brisson	Collaboration with Ddefense Canada, RDDC-Valcartier (Hakima Abou-Rachid)
Tanaka	Collaboration with Drs. H.-Q. Lin, Y. Ma, H. Wang, and C. Zhang in China; Drs. T. Iitaka and Y. Nagai in Japan.
Higgins	Collaboration with European Space Agency on "Percolating Reactive Waves in Particulate Suspensions" project.
Short	Collaboration with Hamburg Observatory of Hamburg University, Germany
Thompson	Collaboration with Infonaut to produce SIMID tool for simulation of disease outbreaks (MITACS Accelerate funded)2008-2011
Liu	collaboration with marine geology and geophysics scientists at Woods Hole Oceanographic Institution, MA, USA
Cowling	Collaboration with NSF/NASA grant to Joel Cracraft on Amazonian Biodiversity. A new Ph.D. student will start with me in September 2013 and so some of his projects will involve this collaboration. Please note that no money is forthcoming from this grant, except for funding of annual workshops and meetings.
Dong	collaboration with Prof. Houk at UCLA
Percival	Collaboration with Prof. Robert West, Organosilicon Research Center, University of Wisconsin-Madison.
Currie	Collaboration with University of Arizona and ExxonMobil Upstream Research Company (COSA project)
Timofeev	Collaboration with University of New South Wales at Australian Defense Force Academy, Canberra, Australia on unsteady shock propagaiton and reflection
Neale	Collaborations with General Motors of Canada
Sushama	Collaborations with Ouranos consortium and HydroQuebec International collaborations with the Swedish Meteorological and HYdrological Institute (SMHI) and the Indian Institute of Science (IISc)
Lewis	Collaborations with two major agricultural biotechnology companies.
Kirshbaum	Compute Canada resources are allowing me to collaborate with Environment Canada on a project involving ensemble forecasting of convective storms. It is also supporting a collaboration with scientists at Université Joseph Fourier in Grenoble, France.
NGO	Consortium de recherche et d'innovation en aérospatiale au Québec (CRIAQ)
Larachi	Consortium de recherche minérale (COREM)
Lamoureux	Consortium for Research in Elastic Wave Exploration Seismology (CREWES.org)
Gakwaya	CRIAQ COMPR511Int'l
Derome	CRSNG-SEP (Engagement Partenarial) lallemand. 2012-2013.
Smith	Czech Academy of Sciences, Prague, Czech Republic J. E. Purkinje University, Usti Nad

	Labem, Czech Republic Un. of Guanajuato, Leon Campus, Leon, Mexico
Ehltling	Daniele Werck-reichhart, CNRS,IBMP, Strasbourg, France
Woolhouse	Data sharing and cooperation agreement with the Nokia Corporation
McDonald	DEAP-3600 Scientific Collaboration SNO+ Scientific Collaboration
Zhorov	Denis Tikhonov, I.M.Sechenov Institute of Evolutionary Physiology and Biochemistry, Russian Academy of Sciences, St. Petersburg Ke Dong, Michigan State University Alexei Rossokhin, Brain Research Institute, Russian Academy of Medicals Sciences, Moscow Stephan Grissmer, Ulm University, Germany Heike Wulff, University of CALifornia, Davis E. Carosatti, Dipartimento di Chimica, Universit� degli Studi di Perugia, Italia
Apel	Diavik Diamond Mine
Alisaraie	Dr. Gregor Fels, Germany Dr. Maria Adelaida Gomez, Colombia
Canal	Dr. Ponnadurai Ramasami, Department of Chemistry, University of Mauritius, Mauritius
Moreau	Ecole Centrale de Lyon, Ecully, France CERFACS, Toulouse, France Siegen Universitat, Siegen, Germany Institut von Karman (VKI), Bruxelles, Belgique Stanford University, Stanford, USA
Lien	Environment Canada Defence R&D Canada - Suffield Atomic Energy Canada Limited (ACEL) Bombardier Aerospace Ford Canada Natural Resources Canada (CanmetENERGY) A.O. Smith Martec LTD.
Pineau	Equipe associ�e, INRIA-Lille
Azaiez	Established collaboration with the research group on Nonlinear Physical Chemistry at the Universite Libre de Bruxelles (Brussels, Belgium).
Walsh	EXMD Airframe Corp. Bombardier Aerospace
Kang	F�d�ration Internationale de Football Association (FIFA) International Olympic Committee
Beauchemin	Finalizing AstraZeneca collaboration. Have past collaborations with Roche Pharma and Adamas Pharma. Have ongoing collaboration with Shingo Iwami at Kyushu University, Japan.
Rouleau	France (Dr. Christian N�ri, OPMD, Paris; Dr. Vincent Meininger, ALS, Paris; Dr Stephanie Millecamp, ALS, Paris; Dr. Marie-Odile Krebs, schizophrenia, Paris), USA (Dr. Pauls, Tourette, Boston; Dr. Robert Brown, ALS, Boston; Dr. David Goldstein, epilepsy, North Carolina; Dr Eliot Sherr, agenesis, San Francisco), Australia (Dr. Garth Nicholson, ALS, Sydney; Dr. Michael Denton, schizophrenia, Brisbane; Dr Ian Blair, ALS, Sydney)
Rouat	France, USA, Japan, Belgium
Poole	Francesco Sciortino, University of Rome, Italy
Karsten	Fundy Tidal Inc. Fundy Ocean Research Centre for Energy Design Systems Analysts
Liu	G8-Multilateral Initiative funded projects between University of Pau, France, University of Toronto and Princeton University.
Soldera	General Motors, American Biltrite, Channel, Defence Canada
Bear	GlaxoSmithKline
Olson	Global Alliance for the Prevention of Prematurity and Stillbirth
Landecker	Global Magneto-Ionic Medium Survey (GMIMS) Consortium, twenty astronomers in seven countries
Flowers	Helgi Bjornsson (U Iceland) Aslaug Geirsdottir (U Iceland) Gifford Miller (U Colorado) Ian Hewitt (Oxford U)
Sydora	Helmholtz Research Centre, Forschungszentrum-Juelich, Germany Institute for Plasma Physics, Max Planck Institute, Greifswald, Germany Ruhr-Universitaet Bochum, Germany Solar-Terrestrial Environment Laboratory (STELAB), Nagoya University, Japan Department of Physics and Astronomy, University of California, Los Angeles
Clark	Hol-Ser Inc., Sainte-C�cile de Milton, Qu�bec
O'Neil	I collaborate with the members of the international ATLAS experiment (3000 scientists from 38 countries).
Wan	I currently work on two projects in the field of econometrics which use SciNet. The

	coauthor of the two projects is Haiqing Xu, assistant professor at University of Texas, Austin.
Talman	I have informal collaborations with scientists at University of Florida, University of Illinois, Bordeaux University, University of Namur and the Donostia International Physics Centre. I am also collaboration on a project called Orgavolt being carried out at Grenoble and Bordeaux University.
Wilhelm-Mauch	IBM Watson Research Laboratories, University of Wisconsin, University of California
Sorelli	IFSTTAR, Paris Lafarge, Lyon
Xi	In collaboration with Bombardier
Goussev	Industrial collaboration with GreenCentre Canada Industrial collaboration with Givaudan Schweiz (Zurich) International collaboration with Prof. Eduardo Peris, Universitat Jaume I, Dpto. Química Inorgánica y Orgánica, Castellón, Spain,
Singh	Industrial collaboration with Integran Technologies, funded through NSERC Engage grant.
Tullis	Industrial: Elastovalve, Cleanfield Energy, Two-West Wind, CANDU (AECL, Bruce, OPG)
Pratt	Infineum Co. UK
Nguyen Dang	Institut de Sciences Moléculaires, (CNRS), Université de Paris-sud XI, Orsay, France (O. Atabek)
Feng	International collaboration in progress: A cell-level biomechanical model of Drosophila dorsal closure, with Len Pismen, Technion, Israel Simulations of bubble-wall collision and rebound, with Roberto Zenit, UNAM, Mexico Self-Propelled Jumping Drops upon Coalescence on Leidenfrost Surfaces: Experiments and Simulations, with Chuan-Hua Chen, Duke University, USA
Soteros	International collaboration with Prof. Mariel Vazquez, San Francisco State University and her research group.
Barreiro	International collaborators: Lluís Quintana-Murci (Pasteur Institut of Paris, France) Ludovic Tailleux (Pasteur Institut of Paris, France) Yoav Gilad (University of Chicago, USA) Bana Jabri (University of Chicago, USA) Jenny Tung (Duke University, USA)
Taylor	International GALFACTS collaboration (45 researchers)
Iftimie	Jean-Francois Truchon and C. Baily, both formerly at Merck-Frosst, Canada
Sargent	King Abdullah University of Science and Technology
Fedosejevs	Lawrence Livermore National Laboratory University of California San Diego Ohio State University General Atomics, California Applied Nanotools, Edmonton
Tremblay	Les Laboratoires Servier France
Protas	long-standing collaboration with General Motors of Canada
Worswick	Magnesium Front End R&D - Industrial: Cosma, 3M, HUYS, Meridian, International: GM, Ford, Chrysler, Government: CANMET Hot stamping - Industrial: Honda, Cosma, ArcelorMittal Magnesium technology (MagNET: University: UBC, McMaster, McGill, Ecole Polytechnique, Industry: GM, Cosma Warm forming of aluminum - Industry: Dana Canada
Bartello	Many
Martin	many including NASA, EPA, Harvard University
Nashmi	Marina Picciotto
Thompson	Merck & Co. Company
Liu	Messier Dowty
Eichhorn	Noel Clark, Department of Physics, University of Colorado at Boulder, USA; Bilal R. Kaafarani, Department of Chemistry, American University of Beirut, Beirut 1107-2020, Lebanon; Sabine Laschat, Department of Chemistry, University of Stuttgart, Germany; Yo Shimizu, Osaka National Research Institute, Osaka, Japan; MAHLE Air Filter Systems Canada in Tilbury, ON;
Pudritz	NSERC CREATE grant (2009 - 2015): Canadian Astrobiology Training Program (CATP); Origins Institute / McMaster is one of 4 major institutions: McGill, McMaster, Toronto, Western
Sadat	NSERC ENGAGE with NLP Technologies

Francois	Olivier Pourquié (IGBMC Strasbourg) Alexander Aulehla (EMBL Heidelberg) Sharon Amacher (Ohio State) Eric Siggia (Rockefeller University) Massimo Vergassola (Pasteur Institute) Grégoire Altan-Bonnet (Memorial Sloane Kettering, New York)
Areibi	ON Semi Conductor, Waterloo, Ontario Canada AGFA, Mississauga, Ontario, Canada
Graham	OneKP (One Thousand Plant Transcriptomes)
Selinger	Our Alberta Livestock Genomics Program (ALGP) project is in collaboration with Dr. Alan Dobson from University College Cork (Cork, Ireland) and Dr. Roman Loftus from Identigen Canada Ltd (Edmonton, AB) Dr. Ralf Greiner - Max Rubner Institute (Karlsruhe, Germany) - Phytate degrading enzymes
Arain	Participated in the North American Carbon Program (NACP) Multi-Scale Synthesis and Terrestrial Model Intercomparison (MsTMIP) Project to provide feedback to the terrestrial biosphere modeling (TBM) community in order to improve the diagnosis and attribution of carbon fluxes at regional and global scales.
Ayers	Patrick Bultinck, Dimitri Van Neck, Stijn De Baerdemackers, Toon Verstraelen, Paul Geerlings, Frank De Proft (Belgium) Carlos Cardenas, Patricio Fuentealba, Alejandro Toro-Labbe, Eduardo Chamorro (Chile) Samantha Jenkins, Steven Kirk (China) Hiroshi Nakatsuji (Japan) Pratim Chattaraj (India)
Bocher	Philippe Bocher has worked two year at PWC as a research engineer. He is now collaborating with large (PWC, RR, Bell Helicopter, L3com, and Bombardier) and small companies (Technickrome, Marquez, Air Terre Equipement).
Pink	Prof. C. B. Hanna, Dept. of Physics, Boise State University, Boise ID, USA
Gauld	Prof. Christopher Francklyn (University of Vermont)
Dufresne	Prof. L. Bricteux (UMons, Belgium), study of swirling jet dynamics.
Szpunar	Prof. Utsinomya, Osaka University (Japan) Prof. Suvas, Benagalore Institute of Science and Technology (India) Prof. Dutkiewicz, Polish Academy of Science (Poland)
Tropper	Prof. W. Lytton, Downstate Medical Center, SUNY, NYC, NYD, USA Prof. C. Carrothers, Dept. Computer Science, RPI, Troy, NYS, USA
Wickham	Professor Weihua Li, Macromolecular Science, Fudan University
Leung	Qatar University, TELUS
Ayotte	Radu Iftimie (UdeM), Bruce Kay (PNNL), Philippe Parent (UPMC-AMU), Gil Alexandrowicz (Technion)
Branzan Albu	SAP Canada Kongsberg Mesotech
Loock	Since 2007 Gianluca Gagliardi, Istitute Nazionale di Ottica, Napoli, Italy: 6 joint publications Since 2012 Oliver Reich, innoFSPEC, Univ. of Potsdam, Germany: 2 joint publications 2007-2009 Michael Ashfold, Laserchemistry, University of Bristol, UK, 5 joint publications 2007-2009 Masahiro Kawasaki, Molecular Engineering, Univ. of Kyoto, Japan, 4 joint publications Industrial collaborators: GasTOPS (Ottawa, ON), Weatherford (Fort Worth, TX and Calgary, AB), IR Photonics (Montreal, QC).
Krauss	SNO+ experiment (members from Canada, USA, UK, Portugal, Germany). PICASSO collaboration (members from Canada, USA, Czech Republic and India).
Nogami	some calculations in collaboration with the University of Tokyo are still underway
Levi	Stanford University
Ali	Status and Trends of European Pollinators
Heniche	Sumitomo Heavy Industry Total Rheosoft
Weinberg	T.Asano (Japan), M.Basilevsky (Russia), R.Bini (Italy), C.Kim (Korea), K.Mislow (USA), Y.Ohga (Japan)
POUTISSOU	T2K
mathie	T2K collaboration
Trischuk	The ATLAS collaboration
Liu	The Autism Genome Project Consortium
Huber	Thomas Jefferson National Accelerator Facility (Newport News, USA) Institut fuer Kernphysik (Mainz, Germany)
Syvitski	Treventis Corporation

Vincent	Ubisoft Montreal
Melacini	UCSD, BCM, NUS
Allen	UNESCO GRAPHIC Programme - Contact Holger Treidel Powell Centre - United States Geological Survey (collaborator) on project led by Thomas Meixner The Nature Conservancy - The Bahamas
Masson	Université d'Orléans
Balima	Université de Nantes (Yann Favennec, Benoit Rousseau)
Sarty	University College London, United Kingdom Konkoly Observatory, Hungary University of Sydney, Australia
Koop	University of Bergen (Frank Nilsen), University of As (Sigbjorn Lien) Norway University of Tasmania (Barbara Nowak) University of Chile (Alejandro Maass, Rodrigo Vidal) Chile Novartis Marine Harvest Canada
Vargas-Baca	University of Texas Austin, USA- Chemistry and Biochemistry - Alan H. Cowley Universidad de Alcalá, Spain - Inorganic Chemistry - Marta E. Gonzalez Mosquera
Peltier	US National Oceanic and Atmospheric Administration Nuclear waste management Organization SUNCOR IBM
Pralat	Used to collaborate with Winston and Mako (2 NSERC Engage projects). Collaboration with BlackBerry and Globe and Mail (another 2 NSERC Engage projects).
Overall	We are collaborating with Dr Frederique Lisacek, Swiss Institute of Bioinformatics to annotate post translational modifications of protein N termini.
Raghavan	We are working on development of an industrial collaboration with food industries.
Plumer	Western Digital Corporation. USA.
Herrmann	Work with Ben Recht fro University of Wisconsin, Madison
Polanyi	Xerox Research Centre of Canada (XRCC).
Donaldson	Xin Gao / King Abdullah University of Science and Technology / KAUST / in bioinformatics
Bourbonnais	Y. Fuseya, Electrotechnic University, Tokyo, Japon M. Tsuchiizu, University of Nagoya, Nagoya, Japon
Chen	1. US Forest Service, US Department of Agriculture 2. Nanjing University, China
Bengio	Ubisoft ZeroSpam D-Wave AT&T Apstat STEERads
Carrington	Martin Quack, ETH, Switzerland
Wu	in the stage of development, not finalized yet.
CÃ´té	Xavier Gonze, UCL, Belgique
Beaulieu	University of California at San Francisco (UCSF), Maastric Clinic in the Netherlands, Elekta
van Beek	IBM Canada
Eagleson	Switzerland
Giroux	TU Bergakademie Freiberg; Saudi Aramco
Brenning	University of Zurich, Geographical Institute, Dr. S. Gruber\ - University of Vienna, Department of Geography and Regional Research, Prof. Dr. T. Glade\ - SNC Lavalin, Geoengineering, Dr. R. Guthrie
Noskov	EBS BioSciences San-Diego, Mayo Clinic Department of Molecular Medicine, VCU Biophysics, Yale University and the National Institutes of Health USA (Section of Molecular Transport), MPI Complex Systems (Germany), RMIT (Melbourne Australia)
gray	- John Katsaras (Oak Ridge National Laboratories) - Keith Gubbins (North Carolina State University) - Edwin Taylor (MIT) - Scott Gregory (Caltech) - M. Jardine (University of St Andrews) - J-F Donati (Université de Toulouse)
Aubé	Active international research collaborations with research groups from China (Hefei - Anhui Institute of Optics and Fine Mechanics, Shanghai - Fudan University, Linan - Zhejiang Forestry University), Spain (Canary Island - Instituto de Astrofísica de Canarias, Madrid - Universidad Complutense, Barcelona - Universidad Politecnica de Catalunya), Slovakia (Astronomical Institute of the Slovak Academy of Sciences) and USA (Palomar observatory).

Lignos	ADF, Inc. DPHV Nippon Steel and Sumitomo Metal Corporation
Gu	Alberta Geological Survey Geological Survey of Canada MIT Taiwan National University
Salahub	Andreas Koster (CINVESTAV, Mexico), Annick Goursot (CNRS, Montpellier, France), Aurelien de la Lande (CNRS, Orsay, France), Helio Duarte (Belo Horizonte, Brazil), Thomas Heine (Jacobs University, Bremen, Germany) plus about 30 international research groups that are developing our deMon (density of Montreal) Density Functional Theory molecular modeling software.
Boisvert	Assemblathon 2 http://assemblathon.org/?tag=assemblathon2 Cray Inc. Argonne National Laboratory
Myers	At present, my main collaborators are Igor Yashayaev (Bedford Institute of Oceanography, Dartmouth), Simon Josey (National Oceanographic Center, U.K.) and Mads Ribergaard (Danish Meteorological Institute, Denmark). My modeling research is aimed at explaining why basically all high-resolution models do a poor job of simulation salinity and freshwater in this region, the impact of the representation of eddies and topography and shelf-deep ocean exchanges of freshwater. I am also starting to get into the impact of sea-ice representation in these models as well as questions of data assimilation. This work is in conjunction with the Canadian Ice Service as part of a large CFCAS funded initiative. My main Canadian collaborators are Charles Hannah at the Bedford Institute of Oceanography (BIO) and Keith Thompson (Dalhousie). I am also an adjunct member of the European DRAKKAR Modelling consortium, based in France and Germany (collaborators include Anne-Marie Treguier, Brest, France; Bernard Barnier, Grenoble, France and Claus Boening, Kiel, Germany). Finally, I am provided the modeling component for a funded IPY project to look at the Canadian Arctic Archipelago, led by Humphrey Melling (IOS) and Simon Prinsenberg (BIO)
secanell	Automotive Fuel Cell Cooperation Corp.
Zingg	Bombardier
Hudson	Canada-France-Hawaii Legacy Survey
Galanis	Chaire CRSNG en efficacité énergétique industrielle (partenaires : Hydro Québec, Rio Tinto Alcan, Ressources Naturelles Canada)
Yevick	CIENA, Ottawa
Yeung	Collaboration with Imperial Oil Ltd.
Kim	Collaboration with Reflexion Pharmaceuticals (US), Technical University of Munich (Germany) and University of Toyama (Japan)
Marshall	Collaboration with the U.S. National Center for Atmospheric Research (NCAR), Boulder CO Collaboration with Bremen University, Germany on paleoclimate dynamics and climate (ocean-atmosphere-ice sheet) modelling. Center for Marine Environmental Sciences (http://www.marum.de/en/MARUM.html)
Roger	Collaborations with: Dr. Tetsuo Hashimoto (Tsukuba University, Japan) Dr. Jeff Sibleman (Univ. Arkansas, USA) Dr. Inaki Ruiz-Trillo (Univ. Barcelona, Spain)
Levesque	Collaboration with biotechnology and pharmaceutical companies
Lu	Collaborators include Canadian Government laboratories (Fisheries and Oceans Canada, Environment Canada), Mercator-Ocean (France), State Oceanic Administration (China), Tianjin University of Science and Technology
Crawford	Delft University Ampair
Winslow	Dr Robin Cooper U of Kentucky Louisville, Ky USA
Tse	Dr. William Yim, iHPC Singapore Dr. Y. Liang, Professor, Kyoto University Dr. T. Iitaka, RIKEN, Japan
Fan	Energent Inc.
Mongeau	Exa Corporation, Burlington, MA, USA Pratt Whitney Canada, Longueuil, Quebec Heroux Devtek, St-Hubert, Quebec
Pharoah	Forschungszentrum Jülich University of Pisa NTNU, Norway Ballard Power Systems
Swan	Horizon Utilities Natural Resources Canada

Militzer	I have had an on going exchange program with two colleagues form the Universidade Estadual de Ilha Solteira in Brazil. Several MASc. students of professors Dr. Sergio Mansur and Compute Canada facilities here at Dalhousie Univesity.
Hoos	IBM ILOG CPLEX group, Actenum Corp.
Paus	IMAGEN consortium, University of Bristol, Cardiff University, University of Oulu, University of Nottingham, MIND Network
Gerhard	Industrial: Geosyntec Consultants, Dupont, Chevron, Dow Chemical International: U Strathclyde, U Edinburgh, Imperial College London, U Queensland, U of Thessoliniki, UFESP (Brazil), USP (Brazil), Arizona State U.
Laurendeau	Institut de mecanique des fluides de Strasbourg, CFS Engineering, KTH University (Stockholm)
Schreckenbach	International collaborations: - Scientific Computing and Modeling SCM, Free University of Amsterdam, The Netherlands, Program Development Within the Environment of the ADF Suite of Programs . - Profs. P. L. Arnold, J. B. Love, University of Edinburgh, UK, αPolypyrrrolic Actinide Macrocyclic Complexes . - Drs. R. L. Martin and E. Batista, Los Alamos National Laboratory, USA, and P. L. Diaconescu, UCLA, USA, Actinide Ferrocene Diamide Complexes . - Prof. H. Alkam, al-Quds University, Palestine, αComputational Inorganic Chemistry . - Dr. W. de Jong, Pacific Northwest National Laboratory, USA, αGas-Phase Actinide Molecules . - Dr. N. Saleh, Al Ain, United Arab Emirates, αNovel Hg Sensors . - Dr. J. K. Gibson, Lawrence Berkeley National Laboratory, USA, αGas-Phase Actinide Chemistry . - Profs. J. F. Stanton, University of Texas at Austin, USA, and J. Autschbach, SUNY Buffalo, USA, αNMR Calculations on Uranium Complexes .
Bhiladvala	International joint work with groups in Germany & China, no formal (co-funded) collaborations.
Tomberli	John Katsaras, SNS, Oak Ridge, TN, USA
Marchand	John Shawe-Taylor
Chakravarty	Johns Hopkin, NIMH
Mueller	Kazuki Yoshizoe, Tokyo Institute of Technology, Japan Akihiro Kishimoto, IBM Research Ireland, Dublin Joerg Hoffmann, Universitat des Saarlandes, Germany
Droit	L'Oreal
Robertson	Longstanding collaboration with the computational linguistics group at the CNR (National Research Centre), Pisa, Italy.
Tarasov	MOCA (Meltwater Ocean Cryosphere Atmosphere response) Network
Van Houten	MRE Collaboration with Prof. Keith Paulsen, Thayer School of Engineering, Dartmouth College
Charbonneau	National Center for Atmospheric Research, Boulder, USA Multidisciplinary Center for Astrophysics (CENTRA), Lisbon, Portugal
Bellec	NeuroRX research, Montreal, CA (Contract Research Organization, industrial collaboration) Biospective, Montreal, CA (Contract Research Organization, industrial collaboration) Child Mind Institute, New-York, USA (international collaboration)
Larsson	new collaboration with Doug Menke at the University of Georgia
Wartak	Optiwave Imperial College
Donovan	Our list of international collaborators is too large to list. Our data is used by a very large fraction of the space physics community. Some of our strongest collaborations are with; UCLA, University of New Hampshire, NASA Goddard Space Flight Center, Stanford Research Institute International, University of Maryland and the University of Alberta.
Nair	Pratt & Whitney Canada University of Southampton, UK University of Flinders, Australia
Thomson	Pratt and Whitney Canada Rolls Royce Canada Westport Innovations
John	Prof Shawn Lin, Rensselaer Polytechnic Institute

Zuckermann	Professor Heiner Linke, Physics, Lund University, Sweden Professor Paul Curmi, Physics, University of New South Wales, Sydney, Australia Dr. Elizabeth Bromley, Physics, Durham University, U.K. Professor Dek Woolfson, Chemistry, Bristol University, U.K. Professor Gerhard Blab, Biophysics, Utecht University, Netherlands Professor Chi-Ming Chen, Physics, National Taiwan Normal University These collaborators are working with me on the synthetic nano-motor project. Other collaborators are listed in the attached CV.
Lewis	Satlantic Inc. University of Miami Xiamen University University Massachusetts Okinawa University WetLabs, Inc. University of Texas Columbia University Harvard University University of North Dakota United States Navy University of South Florida
soulez	Siemens, Cook Medical
tanaka	T2K (Tokai-to-Kamioka) experiment, SK (Super-Kamiokande), DUET (Dual Use Experiment at TRIUMF)
Goldberg	The Tor Project, Inc., Pitney Bowes
Rankin	UCLA, University of Michigan, UC Berkeley, University of Colorado, Peking University
Fafard	University of Auckland (New Zealand) Alcoa SEC Carbon (Japon) Clarkson University Alouette Rio Tinto Alcan
Mostaghimi	University of Tokyo University of Bologna
Beaumont	We collaborate with Dr Jean Braun of the Universite Joseph Fourier Grenoble, France in regard to applications and modifications to Douar
Lister	With Electric Power Research Institute.
Bayne	Work closely with Environmental Monitoring Committee of Lower Athabasca
Beaulieu	Working with Dr. H. Zhang, University College London

Patents

PI Last Name	Description
Gerhard	1. Gerhard, J.I. and Torero, J.L., 2005. STAR In-Situ Subsurface Remediation Technology, UK Patent Office, GB 0525193.9, Filed 10/12/2005. 2. Gerhard, J.I., J.L. Torero, C. Switzer, P.Pironi, G.Rein, 2006. A Method for Remediating Contaminated Land. International PCT Filing, PCT/GB2006/004591, Filed 8/12/2006 (Priority Date 10/12/2005). Patents Granted: Granted Patents US 8,132,987 B2, AU 2006323431 B9, and JP4934832. Pending: EU, Canada, Brazil, China. 3. Method for Volumetric Reduction of Organic Liquids. International PCT Filing, PCT/US12/35248, Files 27/04/2012, Pending.
Mostaghimi	1. Pershin V.A., Chen, L., Mostaghimi, J., æHighly Ordered Structure Pyrolytic Graphite or Carbon carbon Composite Cathodes for Plasma Generation in Carbon Containing Gases ,Filed May 16, 2007, US 8,148,661 B2. 2.L. Pershin, T. Portman, J. Mostaghimi, "Antibacterial Coatings, coated surfaces, and methods for production thereof Provisional US Patent, Filed April 24,2012.
Aubé	Multilayer optical interference filter for light emitting diode
Fan	SYSTEM AND METHOD FOR PROVIDING P2P BASED RECONFIGURABLE COMPUTING AND STRUCTURED DATA DISTRIBUTION. PCT,filed in Nov.2012
Fafard	US Patent serial nb: 61/437,201 Title : Anode and connector for the Hall-Héroult process
Gu	YJ Gu, Eds., Arrays and array methods in global seismology, 1st Edition, VI, 274 p. 103 illus., ISBN: 978-90-481-3679-7, Springer, 2010. YJ Gu, Eds. Special Issue: the great 2004 Sumatra-Andaman Earthquake and Tsunami. Surv. Geophys., 27 (6), ISSN: 0169-3298, 2006.
Douplik	1. A. Douplik, D. Adler, B. Wilson, N. Marcon æMethod for Identifying benign and malignant lesions in Barrett™s esophagus using white light endoscopy , US patent Serial No: US 12/572,473, Filed October 2, 2009 (http://www.freepatentsonline.com/20100087741.pdf). 2. A. Douplik, D. Adler, B. Wilson, N. Marcon æMethod for Identifying malignancies in Barrett™s esophagus using white light

	endoscopy , US patent Serial No: 61/102,091, Filed October 2, 2008.
Werstiuk	1. Processes for the Deuteration and/or Tritiation of Organic Substrates by Hydrogen Substitution. 3,989,705. United States, November 2, 1976. N.H. Werstiuk and T. Kadai; Licensed by Merck, Sharpe and Dohme of Montreal, June 1976. 2. Deuteration of Organic Compounds. 1048856, Canada, February 13, 1979. N.H. Werstiuk and T. Kadai.
Ruda	16. M. Farrell, R. Farrell, and H. Ruda, "Spark Plug Construction", US# 2009/0241321 A1 (UT/Nanospark)
Daneshmand	Amirali Toossi, M. Daneshmand and Dan Sameoto, Microwave Heating with Susceptor, US Provisional patent filed, US 61/650,931, Tec ID #2012020.
Hu	Can-Ming Hu, Nikolai Mecking, Yongsheng Gui, Andre Wirthmann, Lihui Bai: Systems and Methods for RF Magnetic-Field Vector Detection Based on Spin Rectification Effects , United States Patent, No.: US 7,986,140 B2, Date of Patent: Jul. 26, 2011.
Perepichka	D.F. Perepichka, A. Davdand, A. Moiseev, F. Rosei, T. Takenobu, Luminescent organic semiconducting materials & devices, Provis. patent US61/606,501 (2012)
Turner	Edwards, R.A., Turner, R.J, Ladner, C., Larson E., Kazmin, D., & Starkey, J. (2003) Fluorescent detection of proteins in polyacrylamide gels. US Patent Application 10/248,526 initially filed January 27, 2003, published August 7, 2003 as US-2003-0148532-A1. This is a composite of the above claims: 60/319,810, 60/319,810, 60/352,225. International claim PCT/CA03/00095. US Patent 12/505,859 filed Oct 2009. US Patent no US8007646 B2 issued August 30 2011. Martinotti, M.G. Rivardo, F., Allegrone G., Ceri, H., Turner, R.J, (2010) Biosurfactant composition produced by a new Bacillus licheniformis strain, uses and products thereof. PCT/IB2009/0553344 & WO 2010/067245A1. EU patent 09796075.1-2405 accepted July 2011.
Cronin	G. Arnold, D.S. Cronin, P. Lockhart, αDeformable Energy-Absorbing Utility Pole , Canadian Patent Application No. 2,779,209, Filed June 4, 2012.
Buriak	Method For Organizing A Block Copolymer, Buriak et al, US Patent Application #20120301674, Method For Forming A Block Copolymer Pattern, Buriak et al, US Patent Application #20110206905, Methods and Systems for Inducing Immunologic Tolerance to Non-Self Antigens West et al, US Patent Application # 20120021056
Lewis	Contributor to three: UoGuelph Ref. No. Raizada 20120308, Raizada 20120309, and Raizada 20120312
Areibi	Patent application title: ARCHITECTURE, SYSTEM AND METHOD FOR ARTIFICIAL NEURAL NETWORK IMPLEMENTATION Inventors: Medhat Moussa (Waterloo, CA) Antony Savich (Guelph, CA) Shawki Areibi (Waterloo, CA) IPC8 Class: AG06N302FI USPC Class: 706 16 Class name: Data processing: artificial intelligence neural network learning task Publication date: 2012-06-28 Patent application number: 20120166374
Yudin	Hili, R. and Yudin, A. K. αUnprotected amino aldehydes and uses thereof (WO/2008/046232)
Alisaraie	Novel Noscapine Analogs and Method for Designing the Same. Alisaraie, L, Tuszyński, J U.S. Patent Application Serial No. 13/507,181; Ref. No.: 3050184 US02 [DMS-ACTIVE.FID161960]
Soldera	* provisional patent Chapaton, T. J.; Capehart, T. W.; Soldera, A.; Spino, C., Zriba, R., ~Organic superacid monomers containing a bis-sulfonic acid group and methods of making and using the same™; Provisional patent No. P010845-US-NP Publication Date: April, 29 2011. * patent Capehart, T. W.; Capehart, G., Maier, G.; Spino, C.; Chapaton, T. J.; Gross, M.; Soldera, A., ~Organic superacids, polymers, derived from organic superacids, and methods of making and using the same™; Patent No. US7,863,402 B2 (Jan 2011) Publication Date: Jan 3, 2011. * Maier, Gerhard; Capehart, Tenneille Weston; Spino, Claude; Chapaton, Thomas J.; Soldera, Armand, "Organic superacids, polymers derived from organic superacids, and making membranes for fuel cell applicationst"; Patent No. US 20090043068 (Feb 12, 2009), Application No. US 2008-136979, Patent No. WO 2008-US66628 (Dec 24, 2008), Application No. WO 2008-US66628.
Olson	1. Gomez-Lopez N and Olson DM. "LEUKOCYTE ACTIVATION AND METHODS OF

	USE THEREOF, US provisional patent application filed Friday January 21, 2011. Application Serial No. 61/435,018. 2. Pennell CE, Ang QW, Williams S, Katz M, Meriardi M, Olson DM, Menon R and the Preterm Birth Genome Project. æMETHODS OF DIAGNOSING PRETERM BIRTH AND OLIGONUCLEOTIDES FOR USE IN SAME. AU2011900984 filed Thursday March 17, 2011.
Goussev	Hydrogenation and dehydrogenation catalyst, and methods of making and using the same. Goussev, D. G.; Spasyuk, D. PCT Patent Application WO 2013/023307 A1.
Tullis	Canted blades for vertical axis wind turbines - pending
Pratt	Pratt, D. A.; Hanthorn, J. J.; Valgimigli, L. æNovel Substituted Diarylaminos and Use of Same as Antioxidants U.S. Provisional Patent Application 61/493,340 (03 June 2011); PCT/CA2012/000546 (03 June 2012)
Loock	6. Multiple Wavelength Cavity Ring-Down Spectroscopy, Hans-Peter Loock, Helen Waechter, U.S. Patent Application # 13-402,207, Filed: Feb 22nd, 2012. [link] Canadian Patent Application No. 2768946 [link], 5. Optical Pickup for a Musical Instrument, Hans-Peter Loock, Scott W. Hopkins, Nicholas R. Trefiak, Jonathan Saari, Rui Resendes, U.S. Patent Application # 61-105624, [link] Filed: Oct 15th, 2008. Canadian Patent Application No. 2682878 [link], 4. Optical Sensor using organic/inorganic composite materials, Cathleen Crudden, Hans-Peter Loock, Stephen Dickson, Jennifer Du, Larbi Benhabib, R. Stephen Brown, U.S. Patent No. 7,776,611 B2, Filed: Dec 8th, 2005, Issued: August 17th, 2010. [link] Canadian Patent Application No. 2632524 [link], 3. Long Period Grating Sensor Methods and Apparatus, Hans-Peter Loock, R. Stephen Brown, J. Barnes, N. Trefiak, Galina Nemova, and Krista Laugesen, U.S. Patent No. 7,391,942, Filed: June 6th, 2005, Issued: June 24th, 2008. [link] Japanese Patent No 4,660,543 Filed: June 6th, 2005, Issued: January 7th, 2011. Canadian Patent Application No. 2568843 [link], 2. Phase-Shift Optical Loop Spectroscopy, Hans-Peter Loock and Zhaoguo Tong, U.S. Patent No. 7,493,598, Filed: March, 15th, 2005, Issued Jan 27th, 2009. [link] Canadian Patent Application No. 2500876 [link], 1. Optical Loop Ring-Down, Hans-Peter Loock, Stephen Brown, Igor Kozin, Zhaoguo Tong and Richard Oleschuk, U.S. Patent No. 6,842,548, Filed: May, 29th, 2002, Issued: Jan 11th, 2005. [link] 2,386,884, Issued: Feb 9th, 2010. Canadian Patent Application No. 2386884 [link],
Perepichka	D.F.Perepichka, A.Dadvand, A.Moiseev, F.Rosei, T.Takenobu, Luminescent organic semiconducting materials & devices, Provis. patent US61/606,501 (2012)

Inventions

PI Last Name	Description
wang	(10) H. Amarne, Y. L. Rao, S. Wang, æBoron compounds and use thereof , US provisional 61/470.046, Canada formal 2,735, 531, filed March 31, 2011, full patent application filed on March 31st, 2012, US2012/0253044 A1. (11) M. Varlan, S. Wang, æCompounds and methods for enhancing metal luminescence that can be selectively turned off , US provisional Patent Application No. 61/706,295, filed on Sept. 27th, 2012.
Perepichka	D.F.Perepichka, A.Dadvand, A.Moiseev, F.Rosei, T.Takenobu, Luminescent organic semiconducting materials & devices, McGill Report of Invention R13005
Savard	Discovered the Higgs Boson
Rivard	Invention disclosure filed Mar 2013 via TEC Edmonton(2012096)
Shapiro	X. Li, A. Eilam, and M. Shapiro, ``Efficient and facile laser isotope separation using deflection resistant states" US patent application no. 61/748,402.
Moghadas	A Smartphone Game System for Data Collection, Modelling, and Policy Actuation to Mitigate the Spread of Infectious Disease York University 2012-010
Mostaghimi	Metal coatings on organic substrates
Fafard	Nouveau concept de barres collectrices circulaires inclinées insérées dans un bloc cathodique percé sans utilisation de fonte de scellement.

Fan	P2P-based reconfigurable computing methods and system
Hoos	ParamILS (UBC UILO), SMAC (UBC UILO)
Deslongchamps	Reverse-docking, a novel computational method for the study of asymmetric organocatalysis\ \ - Post-Dock, a novel visualization tool for the analysis of molecular docking
Wodak	The MRR software was subject to an invention disclosure at the Hospital for Sick Children.
Plotkin	Methods and Systems for Determining Localized Dielectric Properties of a Molecule Inventors: William C. Guest, Neil R. Cashman, Steven S. Plotkin, Application #: 12/952,140 Publication #: US 2011/0125478 A1, Patent Filing date: Nov 22, 2010, Pub. Date: May 26, 2011. "Methods and Systems for Predicting Misfolded Protein Epitopes" Inventors: Neil R. Cashman, Steven S. Plotkin, William C. Guest, Application #: 12/574,637, Publication #: US 2010/0233176 A1, Patent Filing date: Oct 6, 2009, Pub. Date: Sep. 16, 2010.
Moewes	Methods of Selectively detecting the presence of a compound in a gaseous medium Patent filed for US (Ref. 12-007; BP Ref. P42941US00) and Canada A.Moewes, J.A. McLeod, I.A. Levitsky, P. Sushko, T.D. Boyko (submitted Jan. 29th, 2013).
Bosse	Patent title: Gene expression profiling for prognosis of lung adenocarcinoma Inventors: Bossé Y, Laviolette M, Joubert J, Carrier JS. Application number: 61/706,261 Filing date: September 27, 2012
Risk	Provisional Patent - System and Method for Determining Flux of Isotopologues. Canadian and US Patent Application filed, March 2012. Patent - Probe, Measurement System and Method for Measuring Concentrations of Gaseous Components of Soil Air, and Rates of Gas Transport in Soil " US Patent 7,520,186. Assigned to StFX. License transfer being negotiated. Patent - Improved Apparatus and Method for Measuring Soil Gas Surface Flux " US Provisional 20090301234. Assigned to StFX. Not licensed yet. Patent - Solid State Probe for Measurement of Soil Gas Flux, International Patent Cooperation Treaty Application. PCT/CA2008/002186. Assigned to StFX. Being commercialized.
Meunier	S. Patskovsky, L. Guyot, A-P Blanchard-Dionne, M. Meunier, Provisional Patent Integrated nanoplasmonics biosensors, Provisional US patent, 61469146 (2011) M. Meunier and S. Laforte "Method and apparatus for iterative in-situ optical control of an IC device impedance modified by a pulsed heating source" USSN. 11/902,027 (2007) 4. A. Lacourse, M. Ducharme, H. St-Jean, Y. Gagnon, Y. Savaria and M. Meunier, M., Canadian Grant# 2,533,225, (2006). G. Leclerc, M. Meunier, T. Napporn, S. Poulin, E. Sacher et O. Savadogo, "Radioactively coated device and methods of making same for preventing restenosis" USSN 10/069,210 and PCT/CA00/00974
Merrill	US patent No. 13/310,051 filed Dec 2, 2011, published Jun 7, 2012. Title: "Antivirulence compounds inhibiting bacterial mono-ADP-ribosyltransferase toxins."
Perepichka	D.F.Perepichka, A.Dadvand, A.Moiseev, F.Rosei, T.Takenobu, Luminescent organic semiconducting materials & devices, Provis. patent US61/606,501 (2012)
Plettner	Two patents in review.
Lewis	2 new maize varieties
Areibi	Architecture, System and Method for Artificial Neural Network Implementation Type: Grant Filed: December 10, 2007 Issued: January 24, 2012 Inventors: Medhat Moussa, Antony Savich, Shawki Areibi
Trischuk	Discovery of the Higgs Boson
Sushama	Land-Atmosphere coupling in the high-latitude regions; permafrost evolution; changes to nordic hydrology in a changing climate; impact of lakes on the regional climate; changes to extreme events such as precipitation extremes, floods and droughts across Canada in future climate

Balima	<p>O. Balima, Y. Favennec, J. Boulanger, A. Charette. Optical Tomography with the Discontinuous Galerkin Formulation of the Radiative Transfer Equation in Frequency Domain. Journal of Quantitative Spectroscopy & Radiative Transfer. Vol 113 (2012) 805-814.</p> <p>O. Balima, Y. Favennec, D. Rousse. Optical tomography reconstruction algorithm with the finite element method: An optimal approach with regularization tools. Journal of Computational Physics (Accepted with revision January 2013). [C1] O. Balima, J. Boulanger, A. Charette, D. Marceau. Optical tomography properties estimation. Part I: Tools for an optimal approach with the finite element method. 7th International Symposium on Radiative Transfer, International Centre for Heat and Mass Transfer Conference, June 2-8, 2013, Kusadasi, Turkey. [C2] O. Balima, J. Boulanger, A. Charette, D. Marceau. Optical tomography properties estimation. Part II: Comparative study in optical tomography. 7th International Symposium on Radiative Transfer, International Centre for Heat and Mass Transfer Conference, June 2-8, 2013, Kusadasi, Turkey. [C3] F. Dubot, O. Balima, Y. Favennec, D. Rousse, B. Rousseau. Approximation diffuse de la propagation du rayonnement : Un algorithme d'inversion appliqué à la détermination des propriétés radiatives. XI^e Colloque Interuniversitaire Franco-Québécois sur la Thermique des Systèmes. Saguenay (QC), Canada 3-5 Juin 2013, Reims, France. [C4] F. Dubot, O. Balima, Y. Favennec, D. Rousse, B. Rousseau. Filtering study of diffuse optical tomography reconstruction. Numerical Heat Transfer 2012 International Conference, 4-6 September 2012, Wroclaw, Poland (Abstract n-69 accepted). [C5] F. Dubot, O. Balima, Y. Favennec, D. Rousse. The sobolev gradient regularization strategy for optimal tomography coupled with a finite element formulation of the radiative transfer equation. Inverse Problems, Control and Shape Optimization, April 2 - 4, 2012 Ecole Polytechnique, Palaiseau, France. [C6] O. Balima, Y. Favennec, F. Dubot, D. Rousse. Finite elements parametrization of optical tomography with the radiative transfer equation. Computational Thermal Radiation in Participating Media IV 18-20 April 2012, Nancy, France. [C7] O. Balima, Y. Favennec, F. Dubot, D. Rousse. An introduction to optimal reconstructions in optical tomography. Computational Thermal Radiation in Participating Media IV 18-20 April 2012, Nancy, France.</p>
Yudin	<p>Yudin, A. K.; Assem, N. αSynthetic protein scaffolds Provisional Application 2010 (61367494); Yudin, A. K.; White, C. αAmino acid-based reagents for peptide macrocyclization Provisional Application 2010 (61349864); Yudin, A. K.; Rai, V.; Hili, R. αA method to insert molecular fragments into cyclic molecules Provisional Application 2010 (61349922); Hili, R. and Yudin, A. K. αCyclic amino acid molecules and methods of preparing the same Provisional Application 2010 (PCT/CA2010/000408);</p>

Spin Off Companies

PI Last Name	Description
Olson	PremGen Diagnostics, Inc. Livmor Diagnostics, Inc. Maternica Therapeutics, Inc.
Harroun	Exact Delivery Inc.
Chen	CDM 1. Canadian Forest Service, Natural Resources Canada 2. Environment Canada 3. Agri-Food Canada
Bengio	STEERads
Eagleson	EK3
Mostaghimi	Ablazeon, Inc. Simulent, Inc.
Eliasmith	Applied Brain Research, Inc.
Evans	Biospective
Rogan	Cytognomix (preceded Compute Canada)
Moitessier	Molecular Forecaster Inc.
Ziegler	Scientific Computing and Modeling NV De Boelelaan 1083 1081 HV Amsterdam, The

	Netherlands www.scm.com
Yudin	Encycle Therapeutics
Risk	Forerunner Research Inc.

Industrial Design

PI Last Name	Description
Name	Description
Mostaghimi	Heat shields Heat recovery system
Lewis	Underwater Radiance camera
Chao	TRIUMF VECC test facility TRIUMF E LINAC project with optimized design to minimize coherent synchrotron radiation effects.
Tullis	Blade designs for VAWTs Valve designs for flexible rubber check valves
Larachi	DFT simulations for identifying the most suitable collectors for ore flotation for the mining industry.

Trademarks

PI Last Name	Description
Name	Description
Vize	1. Xenbase

APPENDIX C: OUTREACH AND TRAINING ACTIVITIES

Outreach Activities

Activity	Date	Region	Attendees
WestGrid Alberta HPC Equipment Launch	3-Apr-2012	WestGrid	100
ACFAS booth for UdeM - CQ - CC	7-Apr-2012	Calcul Québec	10
Intro to ACEnet	3-May-2012	Atlantic	7
Intro to ACEnet	4-May-2012	Atlantic	11
Computing Training Workshop 4Girls	10-May-2012	Calcul Québec	200
24 heures des sciences UdeM (booth)	12-May-2012	Calcul Québec	25
Science Rendezvous 2012	12-May-2012	Compute Ontario	105
Compute Ontario Research Day	23-May-2012	Compute Ontario	100
Intro to ACEnet	6-Jun-2012	Atlantic	2
Calcul Canada et le calcul scientifique à UQTR	14-Jun-2012	Calcul Québec	15
Intro to ACEnet	12-Jul-2012	Atlantic	13
Intro to ACEnet	10-Sep-2012	Atlantic	3
Intro to WestGrid & Compute Canada - Patrick O'Leary	19-Sep-2012	WestGrid	87
Présentation à la Faculté d'aménagement, d'architecture, d'art et de design et à la Faculté de Littérature	4-Oct-2012	Calcul Québec	8
Visite avec des département de sciences humaines (design and architecture)	17-Oct-2012	Calcul Québec	6
WestGrid Seminar - Falk Herwig - HPC Driving New Discoveries in Fluid Dynamics	7-Nov-2012	WestGrid	48
Spring undergraduate open house	17-Nov-2012	Compute Ontario	100
Intro to ACEnet	9-Jan-2013	Atlantic	5
Intro to ACEnet	14-Jan-2013	Atlantic	21
visite des groupe de recherche du CHUM - ANGUS	15-Jan-2013	Calcul Québec	5
Assenblé générale de CQ	23-Jan-2013	Calcul Québec	100
Guelph Technology Showcase	29-Jan-2013	Compute Ontario	80
rencontre direction de la recherche du CHUM	1-Feb-2013	Calcul Québec	4
Intruduction au Calcul Haute Performance au CRAD	20-Feb-2013	Calcul Québec	15
WestGrid Seminar - Andriy Kovalenko - A Closer Look at HPC Behind Multiscale Theory & Modeling	6-Mar-2013	WestGrid	32
Fall undergraduate open house	9-Mar-2013	Compute Ontario	100
conférence pour étudiant du CEGEP - UdeM	12-Mar-2013	Calcul Québec	35
rencontre des chercheur de génomique de l'ICM	12-Mar-2013	Calcul Québec	15
SATEC High-School Cluster Build and Parallel Programming	Jan-May 2013	Compute Ontario	10

Training Activities

Activity	Date	Region	Attendees
New User Seminar - offered weekly	Apr 2012 - Mar 2013	Compute Ontario	464
2012 HPC Summer School (Ontario West) - 1 week Courses: Introduction to High Performance Computing; Linux Command Line: A Primer MPI Programming; Programming GPUs with CUDA; HPC Best Practices; HPC Debugging	4-Jun-2012	Compute Ontario	43
Intro to Linux	1-Apr-2012	Atlantic	2
Coast to Coast Seminar - Dr. David Hill (UofSydney)	4-Apr-2012	WestGrid	14
Optimizing Tools for Development and Execution of Programs	4-Apr-2012	Compute Ontario	17
SNUG Tech Talk	11-Apr-2012	Compute Ontario	14
Intro to Shell Scripting	13-Apr-2012	Atlantic	6
Intro to Grid Engine	20-Apr-2012	Atlantic	3
Parallel I/O Tutorial (HPCS 2012)	30-Apr-2012	Compute Ontario	14
SNUG Tech Talk	9-May-2012	Compute Ontario	10
Intro to Linux	10-May-2012	Atlantic	6
Linux command line	11-May-2012	Atlantic	2
Grid Engine	15-May-2012	Atlantic	2
Compilers and dev tools	18-May-2012	Atlantic	2
Introduction to Visualization Workshop (SFU) - Brian Corrie	22-May-2012	WestGrid	6
Shell scripting	22-May-2012	Atlantic	4
Intro to ACEnet - 2 days	23-May-2012	Atlantic	8
Introduction to Visualization Workshop (SFU) - Brian Corrie	23-May-2012	WestGrid	23
Intro to Perl Scripting	24-May-2012	Atlantic	3
Intro to UNIX - 2 days	24-May-2012	Atlantic	7
High School Computer Science Day (UofM)	25-May-2012	WestGrid	82
Intro to Shell scripting	25-May-2012	Atlantic	5
Python	25-May-2012	Atlantic	3
New trends in computational approaches for many-body systems, Summer School - 1 week	28-May-2012	Calcul Québec	64
Intro to Parallel	29-May-2012	Atlantic	3
Intro to MPI	30-May-2012	Atlantic	2
Graduate Program in Scientific Computing (credit course at Western)	May-July 2012	Compute Ontario	12
2012 Compute Ontario Summer Seminar Series Introduction to Compute Ontario and Compute Canada: The supercomputing facilities available and survey on numerical libraries Scientific computing using MATLAB and	May-July 2012	Compute Ontario	70

parallel processing An introduction to multi-precision computing and software Serial, threaded, MPI and GPU execution models Algorithms and software for parallel solution of partial differential equations Optimizing algorithms and code for data locality and parallelism Parallelization overheads Parallelization overheads Part II			
Introduction to Visualization Workshop (SFU) - Brian Corrie	3-Jun-2012	WestGrid	13
Introduction au calcul scientifique	4-Jun-2012	Calcul Québec	20
Introduction au calcul scientifique	5-Jun-2012	Calcul Québec	41
Intro to UNIX	13-Jun-2012	Atlantic	2
SNUG Tech Talk	13-Jun-2012	Compute Ontario	12
AECL Chalk River Workshop - Shared-Memory Programming with OpenMP	19-Jun-2012	Compute Ontario	10
AECL Chalk River Workshop - Distributed-Memory Programming with MPI	20-Jun-2012	Compute Ontario	10
Intro to Makefile	20-Jun-2012	Atlantic	3
AECL Chalk River Workshop - Hybrid Programming with MPI & OpenMP, Open Session	21-Jun-2012	Compute Ontario	5
Intro to HPC (HPC Summer School 2012)	25-Jun-2012	Compute Ontario	23
Intro to Shell (HPC Summer School 2012)	25-Jun-2012	Compute Ontario	18
Intro to MPI (HPC Summer School 2012) - 2 days	26-Jun-2012	Compute Ontario	15
Intro to OpenMP (HPC Summer School 2012)	26-Jun-2012	Compute Ontario	25
Parallel programming with MPI – Part I	26-Jun-2012	Atlantic	45
HPC Best Practices (HPC Summer School 2012)	28-Jun-2012	Compute Ontario	15
Parallel Debugging (HPC Summer School 2012)	28-Jun-2012	Compute Ontario	16
Parallel programming with MPI – Part II	28-Jun-2012	Atlantic	45
Introduction to parallel software	4-Jul-2012	Atlantic	19
Intro to Compute Ontario	9-Jul-2012	Compute Ontario	10
Parallel Programming with MPI, Part I	11-Jul-2012	Atlantic	11
Software Carpentry - 2 days	16-Jul-2012	Atlantic	35
Parallel Programming with MPI, Part II	18-Jul-2012	Atlantic	10
Software Carpentry Bootcamp - 2 days	19-Jul-2012		18
OpenMP, Compute Ontario Access Room	23-Jul-2012	Compute Ontario	10
MPI, Compute Ontario Access Room	24-Jul-2012	Compute Ontario	10
CUDA, Compute Ontario Access Room - 2 days	25-Jul-2012	Compute Ontario	17
Parallel Programming with MPI, Part III	25-Jul-2012	Atlantic	10
Parallel Software Performance	8-Aug-2012	Atlantic	5
Introduction au calcul scientifique, introduction à Linux et Programmation Parallèle OpenMP et MPI (2 tracks)	30-Aug-2012	Calcul Québec	45
Intro to Compute Ontario	10-Sep-2012	Compute Ontario	18
Intro to UNIX	10-Sep-2012	Atlantic	3

Science = Data Tech Talk	12-Sep-2012	Compute Ontario	6
XL Compilers and Optimization	17-Sep-2012	Compute Ontario	7
MPI training session - 2 days	18-Sep-2012	Calcul Québec	25
Coast to Coast Seminar - Dr. Jeremy Kerr (UofOttawa)	19-Sep-2012	WestGrid	47
Workflow Optimization for Large Scale Bioinformatics	25-Sep-2012	Compute Ontario	4
Introduction to Visualization Workshop (SFU) - Brian Corrie	26-Sep-2012	WestGrid	25
Why Would I Use GPUs?	26-Sep-2012	Compute Ontario	15
2012/13 Compute Ontario Seminar Series on Scientific Computing Numerical Computation in Insurance Fraud Auditing High-performance computing algorithms for autocorrelation problems What can we learn from theoretical modeling of macromolecules interacting with membranes? Data Mining for Big Data: Challenges and Opportunities Simulation-based Studies of the Dynamics of Liquid Crystalline Domains Why would I use GPUs? The SOSICIP Consortium: What is it and why would I use it? Nanostructured materials and devices for renewable energy: theory and computation Large-Scale Scientific Signal Processing with Gstreamer Numerical analysis of delay equations with applications Virology in Silico: growing infections in a computer	Sept 2012-Mar 2013	Compute Ontario	140
Coast to Coast Seminar - Dr. Mark Jaccard (SFU)	2-Oct-2012	WestGrid	99
MPI and OpenMP Tools	5-Oct-2012	Atlantic	12
Introduction au calcul scientifique	9-Oct-2012	Calcul Québec	25
Intro to Linux Shell	10-Oct-2012	Compute Ontario	5
Coast to Coast Seminar - Dr. Rick Routledge (SFU)	16-Oct-2012	WestGrid	80
WestGrid Seminar - Jonatan Aronsson - How to Use WG	17-Oct-2012	WestGrid	71
Julia Developers Seminar	23-Oct-2012	Compute Ontario	10
An Introduction to Valgrind	24-Oct-2012	Compute Ontario	2
Coast to Coast Seminar - Dr. Jake Rice (Dept. Fisheries & Oceans)	30-Oct-2012	WestGrid	46
Formation 2 jours Intro au calcul de haute performance et Programmation parallèle (OpenMP et MPI)	30-Oct-2012	Calcul Québec	40
Introduction to Visualization Workshop (SFU) -	1-Nov-2012	WestGrid	17

Brian Corrie			
CITA/Compute Ontario Fall 2012 CUDA Minicourse	Oct-Nov 2012	Compute Ontario	8
Guillimin - Réunion des utilisateurs - Users Meeting	5-Nov-2012	Calcul Québec	20
Intro to Compute Ontario	7-Nov-2012	Compute Ontario	8
iPython Developers Seminar	9-Nov-2012	Compute Ontario	23
Coast to Coast Seminar - Dr. Kennedy Stewart	13-Nov-2012	WestGrid	75
GNU Parallel	14-Nov-2012	Compute Ontario	8
New User Seminar: Part Duex	21-Nov-2012	Compute Ontario	15
Granularities and Messages	26-Nov-2012	Compute Ontario	2
Coast to Coast Seminar - Dr. Robie Macdonald	27-Nov-2012	WestGrid	41
Massively Parallel Assemblers	27-Nov-2012	Compute Ontario	14
Parallel Debugging with DDT	28-Nov-2012	Compute Ontario	4
GPU workshop with introduction to the CUDA language - 2 days	4-Dec-2012	Calcul Québec	55
VNC	12-Dec-2012	Compute Ontario	11
H-NS DNA Assembly	14-Dec-2012	Compute Ontario	7
Guillimin - Réunion des utilisateurs - Users Meeting	21-Dec-2012	Calcul Québec	11
Interactive Molecular Dynamics	9-Jan-2013	Compute Ontario	10
Scientific Computing Bootcamp w/Software Carpentry - 2 days	12-Jan-2013	Compute Ontario	20
Intro to Compute Ontario	16-Jan-2013	Compute Ontario	3
Linux command line	16-Jan-2013	Atlantic	20
Linux command line	16-Jan-2013	Atlantic	4
WestGrid Seminar - Roman Baranowski - How to Use WestGrid Tutorial	16-Jan-2013	WestGrid	54
Grid Engine	21-Jan-2013	Atlantic	15
Guillimin - Réunion des utilisateurs - Users Meeting	21-Jan-2013	Calcul Québec	15
Bash Shell Scripting: Making Linux Work for You	23-Jan-2013	Compute Ontario	19
Scripting	23-Jan-2013	Atlantic	15
Scripting - 1	23-Jan-2013	Atlantic	4
Chemistry applications	29-Jan-2013	Atlantic	10
BGQ Workshop	30-Jan-2013	Compute Ontario	18
Scripting - 2	30-Jan-2013	Atlantic	4
Midi-conférence - Checkpointing	31-Jan-2013	Calcul Québec	22
Introduction to MPI	1-Feb-2013	Calcul Québec	12
WestGrid Seminar - Brian Corrie - Intro to Vizualization	6-Feb-2013	WestGrid	79
Introduction to GPUs and CUDA	15-Feb-2013	Calcul Québec	21
Guillimin - Réunion des utilisateurs - Users Meeting	21-Feb-2013	Calcul Québec	10
Introduction au calcul de haute performance	22-Feb-2013	Calcul Québec	45
Compute Ontario Software Support Updates	27-Feb-2013	Compute Ontario	7
Intro to HPC, St. Lawrence college - 2 days	27-Feb-2013	Compute Ontario	8
Parallel I/O Short Course	27-Feb-2013	Compute Ontario	11

Midi-conférence - Introduction aux systèmes NUMA	28-Feb-2013	Calcul Québec	19
Introduction to OpenMP	1-Mar-2013	Calcul Québec	43
Introduction à Linux pour le calcul scientifique	5-Mar-2013	Calcul Québec	12
Introduction au calcul scientifique	5-Mar-2013	Calcul Québec	35
Formation 2 jours : Le calcul de haute performance et programmation parallèle (OpenMP et MPI)	12-Mar-2013	Calcul Québec	25
Intro to Compute Ontario	13-Mar-2013	Compute Ontario	5
Sparse Matrices in MKL	13-Mar-2013	Compute Ontario	5
C++	20-Mar-2013	Compute Ontario	4
WestGrid Seminar - Doug Phillips - Using MATLAB on WG	20-Mar-2013	WestGrid	42
Guillimin - Réunion des utilisateurs - Users Meeting	21-Mar-2013	Calcul Québec	8
Introduction to ScaleMP	22-Mar-2013	Calcul Québec	18
Linux pour le calcul de haute performance	26-Mar-2013	Calcul Québec	20
Midi-conférence - Le nouveau standard C++ et le CHP	28-Mar-2013	Calcul Québec	24
CES 731 Parallel computing: MPI (credit course at McMaster taught by Compute Ontario instructor)	Jan-Feb 2013	Compute Ontario	2
Scientific Computing; Part I	January 2013	Compute Ontario	13
Scientific Computing; Part II	March 2013	Compute Ontario	13

Outreach and Training Activities

Activity	Date	Region	Attendees
HPCS 2012 (hosted alongside BCNET 2012 Conference) - 3 days	1-May-2012	WestGrid	500

APPENDIX D: BOARD OF DIRECTORS

H E A (Eddy) Campbell

President, University of New Brunswick

A professor of mathematics, Dr. H E A (Eddy) Campbell holds two degrees from Memorial University of Newfoundland and a Ph.D. from the University of Toronto. He held a Natural Sciences and Engineering Research Council (NSERC) Postdoctoral Fellowship at the University of Western Ontario. Dr. Campbell's main research interest is the invariant theory of finite groups and he continues to maintain an active research career. His NSERC Discovery Grant was renewed in 2008 for an additional five years. Dr. Campbell has served in a variety of capacities with NSERC and currently sits on the Executive Committee and the Committee on Research Integrity and is a member of its governing body. Appointed to a five-year term as the UNB President, Dr. Campbell led the university through the development of a strategic plan, building on UNB's rich tradition of education, research and community service.

Dr. Campbell has extensive experience in university administration, having served as President and Vice-Chancellor (Acting) and Vice-President (Academic) at Memorial University in St. John's, Newfoundland. He also served as Associate Dean of the Faculty of Arts and Science and as Professor and Head of the Department of Mathematics and Statistics at Queen's University in Kingston, Ontario.

A past president of the Canadian Mathematical Society, Dr. Campbell is currently a member of the executive and investment committees of MPrime, a successor of the national centre of excellence known as the Mathematics of Information Technology and Complex Systems network (MITACS). These organizations develop programs to provide better links between universities and the communities they serve. In New Brunswick, he serves on the Boards of Future NB, Invest NB, the Atlantic Provinces Economic Council, the Huntsman Marine Science Centre and represents UNB on the New Brunswick Business Council, where he advocates for "Smart(er) NB".

Siobhan Coady

President, Novocom Inc.

Siobhan Coady is a well-respected Newfoundland and Labrador business leader and President of Novocom Inc, a resource procurement company. From 2008 to 2011, she was the Liberal Member of Parliament for the riding of St. John's South-Mount Pearl. She was Critic, Treasury Board; a member of the Industry Committee; and vice chair of the Operations Committee. Prior to entering politics, she owned and operated companies as diverse as Newfound Genomics Inc, a leading biotechnology company; The Clinical Trials Centre, a medical research company; and Bonaventure Fisheries, a privately-held fish harvesting company. Ms. Coady is a past chair (2003) and governor of the Canadian Chamber of Commerce. She was president of the St. John's Board of Trade in 1993. She has been recognized as one of the Top 50 CEO's in Atlantic Canada and has received the Queen's Jubilee Medal. Ms. Coady is also a well-known political commentator for CBC. She currently sits on several private Boards of Directors as well as the Board of the Institute of Corporate Directors, St. John's. She previously was on the Board of Genome Canada, the Public Policy Forum, The St. John's Airport Authority, The Genesis Centre, the Atlantic

Innovation Council and the Institute of Chartered Accountants Newfoundland, to name a few. Ms. Coady is an alumnus of Memorial University of Newfoundland and Labrador, Oxford University and the University of Toronto. She is an accredited director (ICD.D) of the Institute of Corporate Directors and an Accredited Public Relations Professional (APR).

Mark Dietrich

CEO, Ontario Society of Professional Engineers

Mark Dietrich is the Chief Executive Officer of the Ontario Society of Professional Engineers (OSPE). An entrepreneurial leader with 20 years of executive management experience, Mark has a proven track record of building and transforming organizations, increasing revenues, and maximizing organizational effectiveness. He specializes in innovative corporate strategy, marketing, business development and exceptional service delivery. Prior to joining the OSPE, Mark founded Bloodstone Solutions Inc., a Toronto-based professional services firm that specialized in strategic value innovation, lean services, and eGovernment solutions for public and private sector clients.

Mark was also the Executive VP & COO for the Ontario Research and Development Challenge Fund (ORDCF), a \$500 million government fund established to support leading-edge, innovative and industrially relevant university and hospital research. The ORDCF provided support to more than 100+ university-industry research partnerships in diverse areas, including nanotechnology, IT, and bioinformatics. His diverse background in new product development, commercialization, service delivery, and marketing was built through more than a decade of executive leadership roles with companies in the Greater New York City area.

His success stretches across multiple industries, including consulting (strategy, marketing, process improvement, business model innovation), technology and information services (internet service delivery, commercialization, engineered solutions), and finance (project- and asset-based financing), in the United States and Canada, with international mandates. Mark has a degree in Electrical Engineering from Vanderbilt University in Nashville, Tennessee.

Roger Foxall

CEO, Life Science Strategies Inc.

Roger Foxall obtained his B.Sc.(Eng.) in Physical Metallurgy at the Imperial College of Science and Technology, University of London. He obtained his Ph.D. in Physics at the Cavendish Laboratory of the University of Cambridge, followed by postdoctoral studies at the University of Oxford. He moved to Ottawa in 1968 to take up a Research Officer position at the National Research Council. In 1975, he began a series of assignments that prepared him for a career in research management, including a secondment to the Treasury Board Secretariat as Program Analyst.

In 1984, he became Director of the NRC Atlantic Research Laboratory in Halifax, later renamed the Institute for Marine Biosciences, and he was Director General from 1990 until April 1998. Other roles that Roger played during his time in Halifax included membership of the Council on Applied Science and Technology (advisory to the Premier of Nova Scotia); the Steering Committee for the Aquatic Biotechnology Network – AQUATECH; the Board of Directors of the Nova Scotia Oceans Initiative; the Board of the Canadian Centre for Fisheries Innovation; the Editorial Board of the Journal of Marine Biotechnology; and the

International Advisory Board of the Marine Biotechnology Institute of Japan. Roger moved to British Columbia in July 1998, and established a consulting company focused on the life sciences, based on his experience in genomics and marine biotechnology, including experience in forming linkages with Canadian companies and with other institutions throughout Canada, the Americas, Europe and the Asia-Pacific region. From August 2000 through January 2002, he served as the founding President and CEO of Genome British Columbia – one of six centres across the country funded in part by Genome Canada. He then served as Executive Vice President Research until December 2003 and Executive Vice President Corporate Development until August 2005. Roger now specializes in strategic analysis and advice regarding the genome sciences, other areas of the life sciences, as well as governance and management of large-scale science and technology initiatives.

Donald Hathaway

Managing Director, Governance DNA

Don Hathaway has demonstrated his abilities in diverse corporate settings as a CEO in business, a senior partner with international consultancies and a corporate director. His forty-year business career has included major undertakings with government and academia, with over half at senior executive levels, accumulating expertise in strategy, finance, risk management, marketing and corporate governance. He has held some 35 board, committee and board chair roles, putting him at ease on public, private and NFP boards. As an engineer and a serial entrepreneur he is often on the board of small or emerging companies and he has direct experience in high profile roles with public-private partnerships. Further, he has worked with the boards of many of Canada's largest corporations on governance, financial and risk issues. He has strong competencies in board operations, the board-management interface and board committee work, particularly audit, risk, compensation and governance. He has direct experience with corporate re-structuring, mergers and acquisitions, regulatory compliance and initial public offerings. He has written two books on corporate governance, published in 2008 and 2010, and he appears frequently as a speaker or panelist on governance, risk and financial issues. Currently, he is a director of three technology-based companies and a member of the Independent Review Committee for group of mutual funds. As well, he is the Chair of the Advisory Panel on Governance and Management for Compute Canada, the national organization for high performance computing supporting research nationally. He is a Vice Chair of the Ontario Chapter of the Institute of Corporate Directors. He is an advisor to the Canadian Board Diversity Council, and had a leading role in designing the curriculum of its 'Get On Board' governance program. He is a former member of the Dean's Advisory Council of the School of Business and Economics at Wilfred Laurier University. He is a Past President and a Fellow of the Institute of Management Consultants of Ontario, a Past President of the Institute of Management Consultants of Canada, a former Governor of York University, a former Chairman of the University of Waterloo Advisory Council, a former member of the Canadian Employment and Immigration Advisory Council, and a former member of the Advisory Council to the Masters in Business, Entrepreneurship and Technology (MBET) at the University of Waterloo. He is a member of the Institute of Corporate Directors and holds its ICD.D designation. He studied electrical engineering and then mathematics at Sir George Williams University

(now Concordia), and then took an MBA from York University. He has subsequently taken an ongoing stream of specialist studies, including the executive program in economic value analysis (EVA) at the Kellogg School at North-western University and extensive work in risk management.

John Hepburn

Vice-President (Research & International), University of British Columbia

John Hepburn was born in Hamilton, Ontario, and completed his undergraduate studies at the University of Waterloo, graduating in 1976 with his BSc. He continued his education at the University of Toronto and obtained his PhD in 1980. Following two years as a NATO Postdoctoral Fellow at the Lawrence Berkeley National Laboratory, he began his academic career back at the University of Waterloo, where he was appointed an Assistant Professor of Chemistry and Physics in 1982, and ultimately Chair of Chemistry in 1998. In 2001, he moved to the University of British Columbia as a Professor of Chemistry and Physics & Astronomy, and Head of Chemistry.

He became Dean of Science in 2003, and Vice President Research in 2005. The international portfolio was added to John's list of responsibilities in August 2009. He has been a Fellow of the A.P. Sloan Foundation, a Foreign Research Fellow of the CNRS (France), and a Canada Council Killam Fellow. He has been awarded the Rutherford Medal and the Noranda Prize and is a Fellow of the Royal Society of Canada, the American Physical Society, and the Canadian Institute for Chemistry. He is internationally renowned for his research in laser spectroscopy and laser chemistry, and is currently carrying out research in surface science, laser spectroscopy, and quantum control of atoms and molecules. In addition to his work at UBC, John Hepburn currently serves on a number of boards. He is also a member of the Scientific Advisory Committee for the Council of Canadian Academies.

Fassi Kafyeke

Director of Strategic Technologies, Bombardier

Since joining Bombardier Aerospace in 1982, Fassi Kafyeke has had a distinguished career with the organization and has progressively attained positions of increased responsibility. Currently, as the Director of Strategic Technology, Dr. Kafyeke is responsible for all engineering research and development, external relations and Design for Environment at Bombardier Aerospace. In 1980, Dr. Kafyeke graduated as an electromechanical engineer (aerospace) from Belgium's University of Liège. The following year he completed his Master's degree in Air Transport Engineering (Aircraft Operations and Maintenance) at the Cranfield Institute of Technology, England. In 1994, he received his Doctorate in mechanical engineering (Aerodynamics) from École Polytechnique de Montréal, in Canada. From 1981 to 1982, Dr. Kafyeke worked at the Von Karman Institute for Fluid Dynamics, Belgium as a research officer. At the start of his career with Bombardier Aerospace, in 1982, Dr. Kafyeke worked to develop various Computational Fluid Dynamics (CFD) methods for Aerodynamic analysis. He then moved to designing airfoils and wings and then to conducting wind tunnel testing to validate aerodynamic designs. In 1992, he was appointed section chief of Advanced Aerodynamics, Manager in 1996 and elevated to Senior Engineering Advisor in 2004. Since 1996, he was the Chief Aerodynamicist in charge of aircraft aerodynamic design and development and for all development wind-tunnel testing for several Bombardier aircraft, including the Global Express, CRJ700/900/1000

NextGen, Challenger 300 and CSeries aircraft. In 2006, strategic technology was added to his mandate and, in 2007 he became Group Director of Strategic Technology, in charge of the company research and development efforts.

Dr. Kafyeke is a co-author of the book “Computational Fluid Dynamics for Engineers: From Panel to Navier Stokes Methods With Computer Programs”, published by Springer-Verlag in June 2005. In addition, he has published various aerodynamics lecture notes and papers for various associations, including CASI, AIAA, ASME, SAE and AGARD, as well as Bombardier internal reports on aircraft development and testing. In addition, Dr. Kafyeke is actively involved in various groups dedicated to the advancement of aviation and technology. In 2008, he was named Co-chair of the Canadian Aviation Environment Technology Road Map (CAETRM). He is a founding Member of the Board of GARDN (Green Aviation Research and Development Network) since 2009; he was also a Member of the Board of FQRNT (Fonds Québécois pour la Recherche en Nature et Technologie) until 2011 and he is now the Chairman of the Board of the “Regroupement pour le développement de l’avion plus écologique”, a consortium of Québec aerospace industries promoting the development of green aircraft technologies. He is a Fellow of the CASI (Canadian Aeronautics and Space Institute); an Associate Fellow of AIAA (American Institute of Aeronautics and Astronautics); and a Member of RaeS (Royal Aeronautical Society, United Kingdom).

He was the President of the Canadian Aeronautics and Space Institute from 2002 to 2003. In 2001, he was recognized for his work by the Ordre des ingénieurs du Québec (Quebec Order of Engineers) and received the prestigious Grand Prix d’excellence for the year. In October 2009, he received the “Prix Innovation” from the Association of Graduates from École Polytechnique de Montréal.

Nils Petersen

Professor, University of Alberta

Nils Petersen, PhD (California Institute of Technology) is a Professor of Chemistry at the University of Alberta. He is the NINT Fellow and an Honorary Professor of Nanoscale Biological Sciences, University of Twente. Dr. Petersen’s current research focuses on intermolecular interactions in biological membranes, particularly the study of dynamics and distribution of molecules within the membrane as a means of understanding cell-cell communication, signal transduction, adhesion, and locomotion of cells. His work spans a range of disciplines from computation to biology and has led to 130 publications to date. After research positions at Cornell University and Washington University Medical School, he returned to The University of Western Ontario’s Department of Chemistry as a faculty member in 1981. While at Western he was Associate Dean of Graduate Studies (1993-95), Chair of the Department of Chemistry (1995-99), and the first Associate Vice- President (Research) at Western (1999-2000). After nearly three years as Vice- President (Research) at Western, he joined the NRC in 2004 as Director General for the National Institute for Nanotechnology with a concurrent position as Professor of Chemistry at the University of Alberta. In 2011, he retired from the NRC and subsequently served one year as Acting Associate Dean (Research) in the Faculty of Science at U of A.

Dr. Petersen has served on twelve non-for profit Boards for both incorporated and non-incorporated entities. Among the former he was the Chair of the Board of the UWO Research Park, a member of CLLRNet (an NCE) and CMC Microsystems, and he currently

serves as a member of the Boards of the Canadian Light Source, ArboraNano (a Business-led NCE); and PIMS. He was the founding Board Chair for SHARCNet (Shared Hierarchical Academic Research Computing Network), a network of high-performance Beowulf computer clusters in South-western Ontario. Other Advisory Board memberships include the CIHR Institute for Genetics International Advisory Board, the California Nano Systems Institute, and the Canadian Institute for Synchrotron Radiation. He currently Chairs the Board of BiopSys, an NSERC Strategic Network at the University of Toronto.

Janet Rossant

Chief of Research, The Hospital for Sick Children

Dr. Janet Rossant is a Senior Scientist in the Developmental & Stem Cell Biology Program and Chief of Research at The Hospital for Sick Children, Toronto. She is also a University Professor, University of Toronto, and Professor in the Departments of Molecular Genetics, Obstetrics/Gynaecology and Paediatrics, University of Toronto. Her research interests centre on understanding the genetic control of normal and abnormal development in the early mouse embryo using both cellular and genetic manipulation techniques. Her interests in the early embryo have led to the discovery of a novel placental stem cell type, the trophoblast stem cell. She is Deputy Scientific Director of the Canadian Stem Cell Network and directs the Centre for Modelling Human Disease in Toronto, which is undertaking genome-wide mutagenesis in mice to develop new mouse models of human disease. Dr. Rossant trained at the Universities of Oxford and Cambridge, United Kingdom and has been in Canada since 1977, first at Brock University and then at the Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, from 1985 to 2005. She is a Fellow of both the Royal Societies of London and Canada and a Distinguished Investigator of the Canadian Institutes of Health Research. In 2007, Dr. Rossant was awarded the March of Dimes Prize in Developmental Biology and the Conklin Medal from the Society for Developmental Biology. In 2008, Dr. Rossant was elected as a Foreign Associate to the National Academy of Science. Dr. Rossant is actively involved in the international developmental biology community. She was an editor of the journal *Development* for many years and was President of the Society for Developmental Biology in 1996/97. Rossant has also been involved in public issues related to developmental biology, most recently serving as Chair of the Canadian Institutes of Health Research working group on stem cell research and as a member of the National Academies Stem Cell Guidelines Panel.

David Sénéchal

Professor, Université de Sherbrooke

David Sénéchal is a theoretical physicist and professor of Physics at the Université de Sherbrooke. He obtained a BSc (Honours Physics) from McGill University in 1985, and a PhD in theoretical Physics from Cornell University in 1990. After 2 years as NSERC postdoctoral fellow at Laval University, he joined the Faculty at Université de Sherbrooke in 1992, where he has been ever since. He is the co-author of a well-known book on *Conformal Field Theory* (Springer, 1997). Since about 1999, the focus of his research has been on novel computational methods applied to strongly correlated materials, such as high-temperature superconductors. He has been the faculty responsible for high-performance computing at the Université de

Sherbrooke from 2001 to 2011, Scientific director of RQCHP (A Québec HPC consortium of 5 universities) from 2006 to 2011, and a lead researcher in Compute Canada between 2006 and 2011. In particular, he has chaired the main operational committee of Compute Canada from 2006 to 2009 and successfully defended the Compute Canada proposals to CFI in 2006 (the National Platform fund) and 2011 (Major Science Initiative fund). He now chairs the Physics Department at Université de Sherbrooke.

John Towns

Principal Investigator and Project Director, XSEDE

John Towns is the Director of the Collaborative Cyberinfrastructure Program Office at NCSA. He is also the PI and Project Director for XSEDE (Extreme Science and Engineering Discovery Environment), the NSF's premier cyber infrastructure, and leads other projects at NCSA. He has gained a broad view of the needs of computational and data-intensive science and engineering researchers through his key roles in policy and program development and implementation as part of several large-scale NSF projects as well as his involvement in key activities at the University of Illinois where he currently serves on the Research Committee of the IT Executive Governance Committee.

His background is in computational astrophysics making use of a variety of computational architectures with a focus on application performance analysis. At NCSA, he provides leadership and direction in the support of an array of computational science and engineering research projects making use of advanced computing and data resources. He plays significant roles in the deployment and operation of computational, data, and visualization resources, and Grid-related projects that embody the deployment of technologies and services to support the establishment of a distributed computing infrastructure.