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CIPJ

Journal of Management Studies / Revue canadienne d'études de gestion / Canadian Journal of Management Studies / Revue canadienne de gestion / Canadian Journal of Management Studies / Revue canadienne de gestion / Canadian Journal of Management Studies / Revue canadienne de gestion

Host institution



UNIVERSITÉ
LAVAL

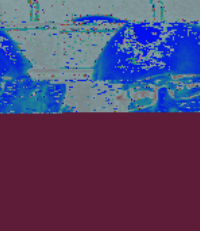
2008-2009 Premier Affiliate Members



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संस्कृत-मूलक शब्दों को संज्ञा



B.





The past year has been a time for re-evaluation and redirection of the research program for the final three year phase of CIPI. A call for proposals for the final funding phase led to the development of a focussed research program of 8 targeted research projects in 4 thrust areas; the Frontier Photonics thrust area was expanded to a new area in Applied Photonics. The current and new research programs were highly rated by the Research Vision Committee and in the midterm review assessment.

In 2008-2009, there has been continued progress in developing next generation therapies and diagnostics. The project on two-photon photodynamic therapy for treatment of age related macular degeneracy, a major cause of blindness in the elderly, will continue for the next three years in order to bring the technique to the clinical trial stage. Advances in lasers and more sophisticated scanning techniques have led to real time scanning of tissue using OCT tomography. Also, microfluidic systems have been developed for analysis of cell contents using a combination of advanced diagnostic techniques such as fiber cavity ring down spectroscopy, surface plasmon resonance and surface enhanced Raman spectroscopy.

More advanced fibre laser and sensor systems based on novel materials and microstructured fibres have been developed over the past year which will continue into the new research program. Canada has considerable strength in the fabrication of specialty plastic, microstructured and infra-red fibres, which CIPI is helping to exploit. The CIPI Frontier Photonics attosecond science project continues to garner international recognition and members of the research group won prestigious prizes in the past year, a tribute to the leading edge research that CIPI is helping to fund in Canada.

In the Information and Telecommunications sector, CIPI recognized very early on the importance of photonic systems on silicon platforms and is committed to continued support in this area. Many big name players such as Intel are now becoming active in this field where Canada is recognized for some of its leading research. Large scale tests were successfully carried out on dark fibre networks of optical packet switching by groups at Laval and McGill Universities, research which will continue with a focus on localized high capacity data networks.

The research program has given Canada a competitive advantage in many areas of application of light, lasers and optical detection. A number of these developments have been featured in the PHOTONS journal published by CIPI, which enjoys a growing lay readership. Many are leading to technology transfer to industry via projects under the TEN program as photonic researchers develop new linkages to commercial and non-academic end users. New opportunities for high impact research are also being stimulated by the Innovative Photonic Applications (IPA) program, which is designed to meet the needs of leading Canadian industries to improve competitiveness and profitability through the application of optical technologies.

The researchers of CIPI are to be commended for their dedication and hard work in meeting the challenging milestones before them. I congratulate them for having made CIPI so successful over the past 10 years. Thanks should also be given to the Thrust leaders, Réal Vallée from Université Laval, Brian Wilson from the University of Toronto and Paul Jessop from McMaster University for their visionary leadership. Likewise, we must acknowledge the contribution of the members of the Research Program Committee and the International Research Vision Committee. Their guidance and insight have been essential in helping the network chart its course into the future. Finally, I would like to express my gratitude to the Deputy Scientific Director, Michel Piché, for his excellent advice and support in ensuring that we have the highest quality research program possible.



Scientific Director

BIOPHOTONICS



B A , *University of Toronto*

B 1:

Optical Spectroscopy of Biological Systems

: Peter Norton, *University of Western Ontario*

David T. Cramb, *University of Calgary* - Stephen Ferguson, *University of Western Ontario* - Cecile Fradin, *McMaster University* - Linda Johnston, *University of Western Ontario*

B 2: A

Biophysical and Biomedical Applications of Laser Light

: Peter Herman, *University of Toronto*

Christopher J. Backhouse, *University of Alberta* - Robert Fedosejevs, *University of Alberta* - Karan Kaler, *University of Calgary* - Lothar Lilje, *Ontario Cancer Institute* - Hans-Peter Looock, *Queen's University* - Jim McMullin, *University of Alberta* - Michel Meunier, *Ecole Polytechnique de Montreal*

B 3:

Optical Spectroscopy of Biological Systems (-)

: David Cramb, *University of Calgary*

Christine Allen, *University of Toronto* - Miguel Burnier, *McGill University* - Melanie Campbell, *University of Waterloo* - Daniel Houde, *Université de Sherbrooke* - Michael S. Patterson, *McMaster University* - Brian C. Wilson, *University of Toronto*

B 4:

Biophysical and Biomedical Applications of Laser Light

A. *Optical Spectroscopy of Biological Systems*

: Brian C. Wilson, *University of Toronto/University Health Network*

Calum MacAulay, *University of British Columbia* - Tze-Wei Yeow, *University of Waterloo*

B 5: B *Beitrag zur Entwicklung der Wirtschaftsprüfung im Bereich des Steuerrechts*
Die Wirtschaftsprüfung im Bereich des Steuerrechts hat sich in den letzten Jahren
deutlich verändert. Dies ist vor allem auf die zunehmende Komplexität der
Steuerrechtsvorschriften zurückzuführen. Die Wirtschaftsprüfer müssen
daher ihre Kenntnisse und Fähigkeiten in diesem Bereich kontinuierlich
aktualisieren und vertiefen.

Ein wichtiger Aspekt ist die zunehmende Digitalisierung der Wirtschaftsprüfung.
Durch den Einsatz von Software und digitalen Tools können die
Wirtschaftsprüfer ihre Arbeit effizienter gestalten und die Genauigkeit
ihre Prüfungen erhöhen.

Ein weiterer Aspekt ist die zunehmende Transparenz der Wirtschaftsprüfung.
Die Wirtschaftsprüfer müssen ihre Prüfungen und Ergebnisse
transparenter darstellen und die Kommunikation mit den Auftraggebern
verbessern.

Insgesamt ist die Wirtschaftsprüfung im Bereich des Steuerrechts
eine anspruchsvolle Aufgabe, die kontinuierliche Weiterbildung und
Anpassung an die sich verändernde Rechtslage erfordert.

Die Wirtschaftsprüfung im Bereich des Steuerrechts ist ein zentraler Bestandteil
der Wirtschaftsprüfung. Sie ermöglicht es den Wirtschaftsprüfern,
die Steuerpflicht ihrer Auftraggeber zu prüfen und sicherzustellen,
dass diese die geltenden Steuerrechtsvorschriften einhalten.

Die Wirtschaftsprüfung im Bereich des Steuerrechts ist eine anspruchsvolle
Aufgabe, die kontinuierliche Weiterbildung und Anpassung an die
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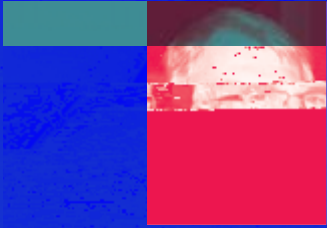
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dass diese die geltenden Steuerrechtsvorschriften einhalten.



3: *Information and Telecommunications*
 : Réal Vallée, *Université Laval*
 Xiaoyi Bao, *University of Ottawa* - Tigran Galstian, *Université Laval* - Jérôme Genest, *Université Laval* - Nicolas Godbout, *École Polytechnique de Montréal* - Suzanne Lacroix, *École Polytechnique de Montréal* - Yunlong Sheng, *Université Laval* - Maksim Skorobogatiy, *École Polytechnique de Montréal*

4: *Information and Telecommunications*
 : Harry E. Ruda, *University of Toronto*
 Harold K. Haugen, *McMaster University* - Frank A. Hegmann, *University of Alberta* - Karen L. Kavanagh, *Simon Fraser University* - John C. Polanyi, *University of Toronto* - Kevin Robbie, *Queen's University*

5: *Information and Telecommunications*
 : Robert Fedosejevs, *University of Alberta*
 See Leang Chin, *Université Laval* - Peter Herman, *University of Toronto* - Robin S. Marjoribanks, *University of Toronto* - Ying Y. Tsui, *University of Alberta* - Réal Vallée, *Université Laval*



INFORMATION AND TELECOMMUNICATIONS

Information and Telecommunications, *McMaster University*

2: *Information and Telecommunications*
 : Sophie La Rochelle, *Université Laval*
 Lawrence R. Chen, *McGill University* - Alberto Leon-Garcia, *University of Toronto* - David V. Plant, *McGill University* - Leslie A. Rusch, *Université Laval*

3. *Mathematical models of the dynamics of infectious diseases*

Abstract

Keywords : Nicolas Godbout, *École Polytechnique de Montréal*
Brian E. King, *McMaster University* - Raymond Laflamme, *University of Waterloo* -
Hoi-Kwong Lo, *University of Toronto* - Amir Majedi, *University of Waterloo* -
Aephraim M. Steinberg, *University of Toronto* - Robin Williams, *University of Toronto*

4. *Mathematical models of the dynamics of infectious diseases*

Abstract

Keywords : Paul Jessop, *McMaster University*
Robert Gauthier, *Carleton University* - Siegfried Janz, *Carleton University* - Rafael
Kleiman, *McMaster University* - Andrew Knights, *McMaster University* - Peter
Mascher, *McMaster University* - Tom J. Smy, *Carleton University* - Robert Tait,
Carleton University - Garry Tarr, *Carleton University* - Dan-Xia Xu, *Carleton University*

A

The TEN program brings together researchers, students and industrial partners to work on a project seeking short term applications, with high commercialization potential.

The IPA program brings together researchers, students, a photonic industrial partner and another "non photonic" partner looking for a short term photonic solution.

According to a recent survey of the completed projects:

- 96% were successful;
- 12% resulted in the development of new products;
- 45% need more development;
- 35% need more research;
- 63% are expected to result in sales for the industrial partner;
- 12% should result in sales of more than \$5M.

Axel Guenther, [5.1](#), and [5.2](#) : Optofluidic Chemiluminescent Microarrays for Automated Gene Expression Analysis

Chang-Qing Xu, [5.3](#), and [5.4](#) : Development of RGB Light Engine for Laser Projection

Daniel Côté, [5.5](#), and [5.6](#) : Live Animal Imaging Active Stabilization Unit

Dwayne Miller, [5.7](#), and [5.8](#) and [5.9](#) : IR Femtosecond Laser Cell Mining – Mapping the Chemistry of the Single Cell

Gholamreza Chaji, Andrei Sazonov, [5.10](#), and [5.11](#) : Reducing Carbon Footprint of Flat Panel Displays

Jan Dubowski, [5.12](#), and [5.13](#) : NQ/CSA/CIPI-Quantum Dot Template Biosensor for Rapid Detection and Quantification of Pathogenic Micro-Organisms in Potable Water

John Cartledge, [5.14](#), and [5.15](#) : Signal Processing for Packet Optical Networks

Karin Hinzler, [5.16](#), and [5.17](#) and [5.18](#) : Integrated Dual-Wavelength Source for Microwave Photonics



Solar cell device being prepared for testing under illumination. Trevor Hall, University of Ottawa, works with Cyrium Technologies and NRC-IMS-CPFC to develop anti-reflection coatings for high efficiency solar cells in concentrated photovoltaic applications.

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Ralph Dacosta, [5A](#), and [7](#) / [5](#) - [A](#) : A Start-Up Corporation Developing a Hand-Held Digital Optical Imaging Platform for Real-Time Pre-Clinical and Clinical Applications

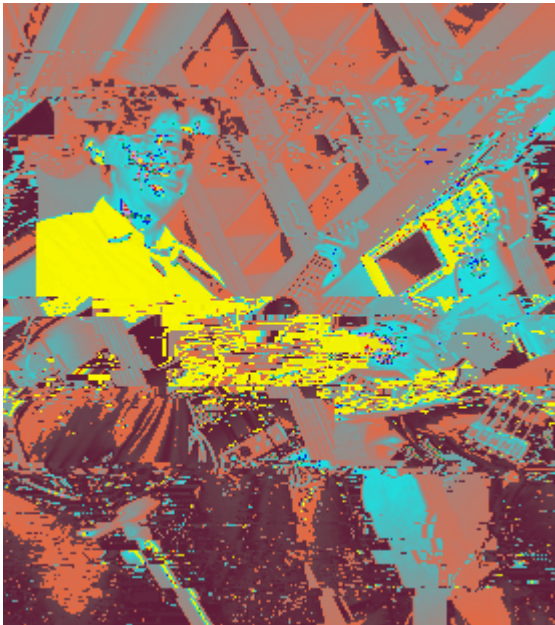
Hans-Peter Loock, [5](#), and [5](#) : The Photonic Guitar

Calum Macaulay, [5B](#), and [7](#) and [B](#) : [A](#) : MEMS Based Hyperspectral Imaging Platform for the Automated Analysis of the Neoplastic Process as the Interaction of Competing Cellular Clonal Populations

Muthukumar Packirisamy, [5](#), and [5](#) : Enhanced Hybrid Integration of Photonics and Microfluidics for Bio-detection with Spectrometer-on-Chip

Michel Piché, [5](#), and [5](#) and [5](#) : Croissance du Silicium par Évaporation Laser

Harry Ruda, [5](#), and [5](#) : MOMS Chip for Gas Analysis



Queen's researchers Daniel Paz Soldan, Nick Ballard and Peter Loock (picture) have previously reported on the use of fiber Bragg gratings as pickups for musical instruments (*Applied Optics*, May 2009). Together with QPS Photonics (Pointe-Claire, QC) a new transducer based on a Fabry-Perot-type fiber cavity is under development for solid body and acoustic guitars. Credits: Greg Black, Queen's University Photographer



A

A **A** **-A** were selected Grands Lauréats Le Soleil/
Radio-Canada

A **A** **-A** **-A** were selected
Lauréat Forces Avenir 2008

A received the 2009 IEEE Microwave Prize
for their work on temporal imaging

B were awarded the Engineers
Canada 2009 National Award for an Engineering project or Achievement for developing a
low-cost USB powered diagnostic chip.

A **B**
Nominated as consultant with DESY in Hamburg, Germany
Nominated Honorary Doctorate at the F.U. Berlin, Germany
2009 SIAM Fellow

Nominee for the Killam Research Award, U. of Waterloo

A **B** received the NSERC J.C. Polanyi Award 2008

2009 NSERC Gerhard-Herzberg Award in science and engineering

Fellow of the Canadian Chemical Institute of Canada
2008 Award for outstanding achievement in supervision, Faculty of Grad studies,
University of Calgary

Best Student Paper Award at the LASE 2009 SPIE Photonics West Conference

2009 McBryde Medal by the Canadian Society for Chemistry

-A
Quebec Lieutenant-Governor's Medal

2008 NSERC Innovation Challenge Award



Paul Corkum receives the 2009 NSERC G. Herzberg Award from Prime Minister Stephen Harper and NSERC President Suzanne Fortier. Credits: NSERC

Fellow of the Royal Society of Canada

CRC Tier 2 Chair in Nanomaterials and Photonics and CFI infrastructure grant

Appointed to the Science Advisory Review Board at the LCLS Stanford, USA
Japanese Physical Science Society Fellowship

Fellow of the Engineering Institute of Canada
James McGill Professorship
Bell Canada/NSERC Industrial Research Chair in Ultra-High Bit Rate Optical Transport and Access Networks

A
Fellow of the American Physical Society
Fellow of the Optical Society of America

B
Professor-at-Large at the Institute for Advanced Studies, University of Western Australia

Darren Kraemer receives the first CFI Young Photonic Innovator Award from Sylvain Charbonneau, Director, Applications Technologies, NRC-IMS, CPFC. Credits: Pierre Bolduc



Group of CIPI-S students at CIPI AGM in Quebec, May 2009. Credits: Pierre Bolduc

Number of students and theses completed by gender and nationality

			Number of students	Theses completed
PhDs	Male	Canadian*	55	11
		International	24	3
	Female	Canadian*	14	1
		International	7	0
	TOTAL		100	15

			Number of students	Theses completed
Masters	Male	Canadian*	38	13
		International	12	6
	Female	Canadian*	16	2
		International	1	1
	TOTAL		67	22

* Includes permanent residents



2010-2011


- Entrepreneurship theme: Dr. Marc Soucy from InnovMetric Software Inc. was kind enough to share his experience on starting his own business
- Student poster competition: winners were Véronique Zambon (U. Laval), Ryan Bolen (U. Ottawa) and Alexandre April (U. Laval)

2008-2009

- Photonics ToolkiT in Quebec City at U. Laval
- Canadian Graduate Summer School of Biophotonics in Toronto at Ryerson University



*CIPI-S's Geneviève Taurand presenting CIPI-S at Photonics ToolkiT in Quebec City.
Credits: Photonics ToolkiT*



*Skating party in Peter Herman's, U. Toronto, back yard.
(5th from the left)
Credits: Peter Herman's group*

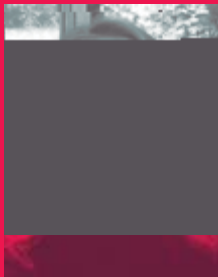
CIPI-S Executive



President
University of Calgary



Vice-President
University of Calgary



Treasurer
McGill University



Web Site Coordinator
Simon Fraser University



Communications Coordinator
University of Toronto

- OCE Discovery 2008, CIPI booth, [http://www.oce2008.com](#),
May 2008
- Frontiers in Neurophotonics Summer School 2008, CIPI sponsorship, [http://www.frontiersinphotonics.com](#),
May 18-24, 2008
- Photonics North 2008, CIPI Booth, [http://www.photonicsnorth.com](#),
June 2-4, 2008
- LPM 2008-Laser Precision Micro-Fabrication, organized by CIPI, [http://www.lpm2008.com](#),
June 17-19, 2008
- 1st International Symposium on Laser Ultrasonics, CIPI sponsorship, [http://www.lsu2008.com](#),
July 16-18, 2008
- OPTO 2008 Conference, CIPI organized the Canadian participation, [http://www.opto2008.com](#),
September 27-October 8, 2008
- MatLab Catia Workshop, organized by CIPI-S, [http://www.matlabcatia.com](#),
November 28, 2008
- Laser Control and Monitoring in New Materials, Biomedecine, Environment, Security and
Defense, organized by NATO Advanced Study Institute, CIPI sponsorship, [http://www.lcm2008.com](#),
November 24 to December 5, 2008
- Photonic Solutions for Detection and Identification of Nanoparticles in Air and Liquids,
organized by CIPI, [http://www.psdinall.com](#),
January 21, 2009
- Photonics West 2009, CIPI Booth, [http://www.photonicswest.com](#), **A, 5, A,**
January 26-29, 2009
- Photonics ToolKIT, CIPI sponsorship, [http://www.photonics.com](#),
March 5-8, 2009
- CLAN-Canadian Laser Application Network Workshop, organized by CIPI, [http://www.clan2009.com](#),
March 11-12, 2009
- Graduate Summer School on Optical Coherence Tomography and Bioimaging, organized
by CIPI-S, [http://www.gssoc2009.com](#)

Researcher

University

Project Title

Student

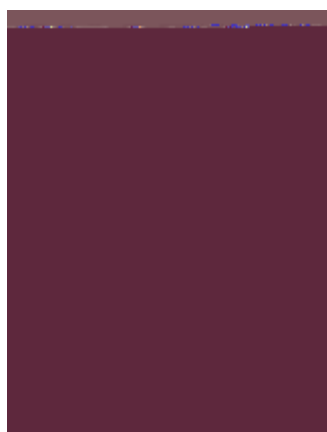
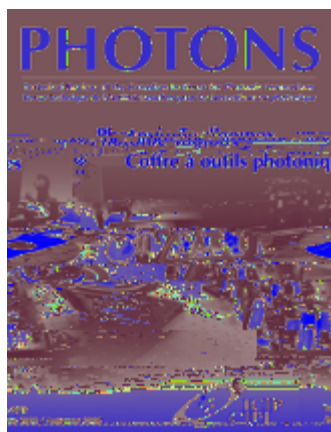
JESSOP,
Paul

McMaster

MORANDOTTI,
Roberto

SKOROBOGATYI,
Maksim

Articles published in refereed publications:	178
Other published refereed contributions:	98
Published non-refereed contributions:	46
Specialized publications:	74
Total publications:	396



Cover illustrations of PHOTONS magazine published by CIPI

Patent applications filed:	17
Patents issued:	2
Licenses granted to industry:	2
Companies created:	2
Collaboration / technology transfer projects:	38



April 1, 2008 - March 31, 2009



REVENUE

Balance beginning of the year	Cash	941 834 \$
NCE Grant for the year	Cash	4 243 000 \$





A 1, 2008

31, 2009

By A

Chair

..., consultant

Voting Members

..., *



Chair

A. [Redacted], Scientific Director, CIPI;
University of Alberta

Members

- A.** [Redacted], MPB Lasertech Inc.
- A.** [Redacted], NRC – IMS, CPFC
- A.** [Redacted], University of Rochester
- A.** [Redacted], TeraXion Inc.
- A.** [Redacted], McMaster University
- A.** [Redacted], DRDC Valcartier
- A.** [Redacted], INO
- A.** [Redacted], Kodak Graphic Communications Canada
- A.** [Redacted], University of Central Florida
- A.** [Redacted], COPL, Université Laval,
- B.** [Redacted], University Health Network – OCI
- A.** [Redacted], University of British Columbia

Ex-officio, non-voting members

- B.** [Redacted], Director of Administration, CIPI
- [Redacted], Communications Coordinator, CIPI
- [Redacted], President and CEO, CIPI

Observers

- A.** [Redacted], Program Officer, NCE (replaced by Tia Moffat in January 2009)
- [Redacted], Deputy Scientific Director, CIPI; Université Laval
- [Redacted], Vice-President, CIPI-S; University of Calgary



Chair

A. [Redacted], Scientific Director, CIPI;
University of Alberta

Members

- B.** [Redacted], Stanford University, USA
- [Redacted], École Normale Supérieure, Paris, France
- [Redacted], UC Davis, University of California, USA
- A.** [Redacted], SPIE
- A.** [Redacted], Centre national de la recherche scientifique, France



Carleton University
Concordia University
École Polytechnique de Montréal
INRS - Énergie, Matériaux et
Télécommunications