

# PROCEEDINGS OF SPIE

## ***Photonics North 2011***

**Raman Kashyap**  
**Michel Têtu**  
**Rafael N. Kleiman**  
*Editors*

**16–18 May 2011**  
**Ottawa, Canada**

*Sponsored by*

OPIN—Ontario Photonics Industry Network (Canada)  
Quebec Photonic Network (Canada)  
INO—Institut National d'Optique (Canada)  
CPC—Canadian Photonics Consortium (Canada)  
Centre d'optique, photonique et Laser, Université Laval (Canada)

*Cooperating Organizations*

SPIE  
CIPI—Canadian Institute for Photonic Innovations (Canada)

*Published by*

SPIE

**Volume 8007**

Proceedings of SPIE, 0277-786X, v. 8007

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Photonics North 2011*, edited by Raman Kashyap, Michel Têtu, Rafael N. Kleiman, Proceedings of SPIE Vol. 8007 (SPIE, Bellingham, WA, 2011) Article CID Number.

ISSN 0277-786X  
ISBN 9780819485816

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA  
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445  
SPIE.org

Copyright © 2011, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at [copyright.com](http://copyright.com). Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/11/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

The logo for SPIE Digital Library features the word "SPIE" in a bold, sans-serif font above the words "Digital Library" in a similar font. To the right of the text is a stylized graphic consisting of three vertical bars of varying heights, with a curved line arching over them.

[SPIDigitalLibrary.org](http://SPIDigitalLibrary.org)

---

**Paper Numbering:** Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

# Contents

xi	<i>Conference Committee</i>
xiii	<i>Introduction</i>

---

## BIOPHOTONICS

---

8007 02	<b>Biosensors based on the plasmonic properties of Au microhole arrays (Invited Paper)</b> [8007-36] L. S. Live, J. Breault-Turcot, O. Bolduc, J.-F. Masson, Univ. de Montréal (Canada)
8007 03	<b>Sensing of bacteria immobilised under static conditions using long-range surface plasmon waveguides in Cytop</b> [8007-04] A. Khan, O. Krupin, E. Lisicka-Skrzek, P. Berini, Univ. of Ottawa (Canada)
8007 04	<b>Simultaneous 1310/1550 dual-band swept laser source and fiber-based dual-band common-path swept source optical coherence tomography (Invited Paper)</b> [8007-07] Y. Mao, S. Chang, E. Murdock, C. Flueraru, National Research Council Canada (Canada)
8007 05	<b>Labview programming for swept-source full-field optical coherence tomography</b> [8007-11] S. Chang, Y. Mao, C. Flueraru, National Research Council Canada (Canada)
8007 06	<b>Measurement of long-range surface plasmon-polariton devices in Cytop</b> [8007-18] H. Fan, E. Lisicka-Skrzek, P. Berini, Univ. of Ottawa (Canada)
8007 07	<b>Synthesis and characterization of silver-PDMS nanocomposite for the biosensing applications</b> [8007-55] J. Ozhikandathil, S. Badilescu, M. Packirisamy, Concordia Univ. (Canada)
8007 08	<b>Filamentation of femtosecond laser pulses as a source for radiotherapy</b> [8007-74] R. Meesat, J.-F. Allard, H. Belmouaddine, T. Brastaviceanu, L. Tremblay, B. Paquette, J.-P. Jay-Gerin, J. R. Wagner, M. Lepage, D. Houde, Univ. de Sherbrooke (Canada)
8007 09	<b>Sensitivity analysis of 1D and 2D photonic crystals sensors based on change of thickness and refractive index in material</b> [8007-76] A. K. Mudraboyina, J. Sabarinathan, The Univ. of Western Ontario (Canada)

---

## CLEAN ENERGY PHOTONICS

---

8007 0A	<b>Energy-efficient extensions in passive optical networks</b> [8007-12] R. Radziwilowicz, J. G. Benitez, T. J. Hall, Univ. of Ottawa (Canada)
---------	---

---

## FIBRE LASERS AND AMPLIFIERS

---

- 8007 0B **160W single-mode single-frequency Yb-doped fiber laser with fiber Bragg grating inscribed by UV femtosecond exposure and two beam interference** [8007-23]  
M. Becker, S. Brückner, E. Lindner, M. Leich, M. Rothhardt, S. Unger, H. Bartelt, Institute of Photonic Technology (Germany)
- 8007 0C **Growth and stability of UV and VIS femtosecond written fiber Bragg gratings in different rare earth doped fibers** [8007-32]  
J. Fiebrandt, E. Lindner, M. Becker, S. Brückner, M. Rothhardt, H. Bartelt, Institute of Photonic Technology (Germany)
- 8007 0D **Mid-infrared sources based on the soliton self-frequency shift** [8007-48]  
A. M. Al-kadry, M. Rochette, McGill Univ. (Canada)
- 8007 0E **Single-longitudinal-mode fiber optic parametric oscillator based on Smith predictor control scheme** [8007-78]  
A. Salehiomran, S.-R. Modirnia, B. Boulet, M. Rochette, McGill Univ. (Canada)

---

## MICROWAVE PHOTONICS

---

- 8007 0F **A wideband frequency tunable optoelectronic oscillator incorporating a tunable microwave photonic filter based on a phase-shifted fiber Bragg grating** [8007-37]  
W. Li, J. Yao, Univ. of Ottawa (Canada)
- 8007 0G **Ultra-wide-band coplanar waveguide based impedance transformer using slow-wave electrodes** [8007-64]  
X. Yao, N. A. F. Jaeger, The Univ. of British Columbia (Canada)
- 8007 0H **Real-time interrogation of a linearly chirped fiber Bragg grating sensor based on chirped pulse compression using a Sagnac loop interferometer** [8007-69]  
W. Liu, J. Yao, Univ. of Ottawa (Canada)

---

## OPTICAL TRAPPING, LASER HEATING, COOLING, AND NANO-MANIPULATION

---

- 8007 0I **Super-radiance and fluorescence are two approaches to laser cooling of solids** [8007-57]  
G. Nemova, R. Kashyap, École Polytechnique de Montréal (Canada)
- 8007 0J **Pulsed laser deposition of Si nanodots for photonic applications** [8007-67]  
M. Gupta, F. R. Chowdhury, V. Sauer, Univ. of Alberta (Canada); S. S. Yap, T. W. Reenaas, Norwegian Univ. of Science and Technology (Norway); Y. Y. Tsui, Univ. of Alberta (Canada)
- 8007 0K **Using optical tweezers to study mechanical properties of collagen** [8007-75]  
N. Rezaei, B. P. B. Downing, A. Wiczorek, C. K. Y. Chan, R. L. Welch, N. R. Forde, Simon Fraser Univ. (Canada)

- 8007 OL **Laser-based proton acceleration on ultrathin foil with a 100-TW-class high intensity laser system** [8007-86]  
S. Fourmaux, Univ. du Québec (Canada); S. Buffechoux, Univ. du Québec (Canada) and LULI, CNRS, Univ. Paris 6, Ecole Polytechnique (France); S. Gnedyuk, Univ. du Québec (Canada); B. Albertazzi, Univ. du Québec (Canada) and LULI, CNRS, Univ. Paris 6, Ecole Polytechnique (France); D. Capelli, LULI, CNRS, Univ. Paris 6, Ecole Polytechnique (France); L. Lecherbourg, Univ. of Toronto (Canada); A. Lévy, P. Audebert, LULI, CNRS, Univ. Paris 6, Ecole Polytechnique (France); D. Houde, Univ. de Sherbrooke (Canada); R. Marjoribanks, Univ. of Toronto (Canada); F. Martin, H. Pépin, Univ. du Québec (Canada); J. Fuchs, LULI, CNRS, Univ. Paris 6, Ecole Polytechnique (France); J. C. Kieffer, Univ. du Québec (Canada)

---

#### OPTICAL DEVICES AND WAVEGUIDES

---

- 8007 OM **Fiber Bragg grating sensor and waveguide grating sensor (Invited Paper)** [8007-41]  
P. Long, O/E Land Inc. (Canada)
- 8007 ON **Green light generation based on periodically poled LiNbO<sub>3</sub> waveguides (Invited Paper)** [8007-62]  
C. Xu, J. Sun, Y. Gan, McMaster Univ. (Canada)
- 8007 OO **Design, fabrication, and characterization of nanoscale plasmonic networks (Invited Paper)** [8007-43]  
M. A. Swillam, B. Lau, C. Lin, A. S. Helmy, Univ. of Toronto (Canada)
- 8007 OP **Waveguide crossing characterization for silica planar lightwave circuits** [8007-17]  
D. Celso, P. Dumais, S. Paquet, J. Seregelyi, C. Callender, Communications Research Ctr. Canada (Canada)
- 8007 OQ **Thermo-optic silica PLC devices for applications in high speed optical signal processing** [8007-19]  
C. Blanchetière, C. L. Callender, S. Jacob, C. J. Ledderhof, P. Dumais, D. Celso, Communications Research Ctr. Canada (Canada); L. R. Chen, P. Samadi, McGill Univ. (Canada)
- 8007 OR **A pressure sensor using tapered optical fiber and curved polymer films** [8007-20]  
X. Dai, H. Ding, C. Blanchetière, S. J. Mihailov, Communications Research Ctr. Canada (Canada)
- 8007 OS **Advances in terahertz waveguides and transmission lines (Invited Paper)** [8007-22]  
H. Pahlevaninezhad, T. E. Darcie, B. Heshmat, Univ. of Victoria (Canada)
- 8007 OT **Planar lightwave circuits: it's all in the cladding** [8007-28]  
P. Dumais, C. Callender, J. Jiang, C. Blanchetière, D. Celso, S. Jacob, C. Ledderhof, Communications Research Ctr. Canada (Canada)
- 8007 OU **Simultaneous slow light, fast light, and continues slow to fast light tuning in a microresonator via interaction of dual inputs** [8007-35]  
H. Shahoei, J. Yao, Univ. of Ottawa (Canada)
- 8007 OV **Vertically coupled Si-based athermal double-ring biosensor** [8007-39]  
Y. Xiong, W. N. Ye, Carleton Univ. (Canada)

- 8007 0W **Graded index MMI and its application in optical communications** [8007-40]  
M. A. Swillam, Univ. of Toronto (Canada); M. H. Bakr, X. Li, McMaster Univ. (Canada)
- 8007 0X **Designing a nanometer-scale light bending structure** [8007-46]  
M. W. Maqsood, K. J. Chau, The Univ. of British Columbia (Canada)
- 8007 0Y **Imaging properties of different refractive axicons** [8007-66]  
A. Saikaley, Laurentian Univ. (Canada) and Algonquin College (Canada); S. Matoug, Laurentian Univ. (Canada); I. Golub, Algonquin College (Canada); B. Chebbi, Laurentian Univ. (Canada)
- 8007 0Z **Performance comparison between silicon-on-insulator curved waveguides and corner turning mirrors** [8007-70]  
Q. Zheng, I. Hasan, D. Sun, S. Abdul-Majid, T. J. Hall, Univ. of Ottawa (Canada)
- 8007 10 **SOI back reflector for Tb-doped oxide electroluminescent devices** [8007-73]  
H. S. Saini, Carleton Univ. (Canada); T. W. MacElwee, A. Rankin, Group IV Semiconductor (Canada); J. Wojcik, McMaster Univ. (Canada); A. M. Miles, N. G. Tarr, Carleton Univ. (Canada); P. Mascher, McMaster Univ. (Canada)
- 8007 11 **Reflection mode two-dimensional photonic-crystal-slab-waveguide-based micropressure sensor** [8007-79]  
Y. Wang, A. Bakhtazad, J. Sabarinathan, The Univ. of Western Ontario (Canada)
- 8007 12 **Light filtering using subwavelength periodic structures on polymer material** [8007-82]  
S. V. Grayli, B. Omrane, C. Landrock, B. Kaminska, Simon Fraser Univ. (Canada)
- 8007 13 **Angle dependent far-field spectroscopy on nanohole arrays** [8007-83]  
S. V. Grayli, B. Omrane, C. Landrock, B. Kaminska, Simon Fraser Univ. (Canada)

---

#### OPTOELECTRONIC AND INTEGRATED DEVICES AND NETWORKS

- 8007 14 **An architectural approach to the wavelength nonuniformity problem of silicon photonic resonators (Invited Paper)** [8007-72]  
C.-T. Lea, Hong Kong Univ. of Science and Technology (Hong Kong, China); B.-C. Lin, National Univ. of Tainan (Taiwan)
- 8007 15 **Electronic mitigation of fiber transmission impairments in 100Gbit/s WDM phase encoded transmission with optical add-drop multiplexers** [8007-01]  
R. Asif, C.-Y. Lin, Friedrich-Alexander-Univ. of Erlangen-Nürnberg (Germany) and SAOT (Germany); M. Usman, Friedrich-Alexander-Univ. of Erlangen-Nürnberg (Germany); M. Holtmannspoetter, B. Schmauss, Friedrich-Alexander-Univ. of Erlangen-Nürnberg (Germany) and SAOT (Germany)
- 8007 16 **Photodeterioration and recovery treatment for silicon nanocrystal luminescence** [8007-13]  
R. Karmouch, D. Barba, D. Koshel, F. Martin, G. G. Ross, Institut National de la Recherche Scientifique (Canada)
- 8007 17 **Reducing the energy consumption of the reliable design of IP/WDM networks with quality of protection** [8007-24]  
B. Kantarci, H. T. Mouffah, Univ. of Ottawa (Canada)

- 8007 18 **A two-phonon regime of operating an advanced prototype of a multichannel acousto-optical spectrometer for the Mexican Large Millimeter Telescope** [8007-34]  
A. S. Shcherbakov, D. Sanchez Lucero, K. J. Sanchez Perez, A. Luna Castellanos, National Institute for Astrophysics, Optics and Electronics (Mexico)
- 8007 19 **A new methodology for optical sensing and identification using optical-disc drives** [8007-47]  
S. Schaefer, K. J. Chau, The Univ. of British Columbia (Canada)
- 8007 1A **Naturally occurring tenebrescent materials gives insight into the development of optically active materials whose attributes are controlled by two dopants** [8007-10]  
D. Olivieri, Crystal Ray Technologies Inc. (Canada)

---

#### PHOTONIC AND OPTICAL DESIGN AND SIMULATION

---

- 8007 1B **High performance multimode interference couplers for coherent communications in silicon (Invited Paper)** [8007-33]  
R. Halir, Univ. de Málaga (Spain); G. Roelkens, Ghent Univ. (Belgium); A. Ortega-Moñux, J. G. Wangüemert-Pérez, I. Molina-Fernández, Univ. de Málaga (Spain)
- 8007 1C **Modelling of optical trapping (Invited Paper)** [8007-42]  
M. Šiler, V. Karásek, O. Brzobohatý, Institute of Scientific Instruments of the ASCR, v.v.i. (Czech Republic); T. Čížmár, Univ. of St. Andrews (United Kingdom); P. Zemánek, Institute of Scientific Instruments of the ASCR, v.v.i. (Czech Republic)
- 8007 1D **Slow-light enhanced spectrometers on chip (Invited Paper)** [8007-08]  
Z. Shi, The Institute of Optics, Univ. of Rochester (United States); R. W. Boyd, The Institute of Optics, Univ. of Rochester (United States) and Univ. of Ottawa (Canada)
- 8007 1E **Systematic approach for tolerance analysis of photonic systems** [8007-14]  
J. F. C. van Gurp, M. Tichem, U. Staufer, Delft Univ. of Technology (Netherlands)
- 8007 1F **Retrieval of diffusing surface by two-frame interferometric method with blind phase shift of a reference wave** [8007-15]  
L. I. Muravsky, A. B. Kmet', T. I. Voronyak, Karpenko Physico-Mechanical Institute (Ukraine)
- 8007 1G **Design of hydrogen gas sensors based on surface plasmon waveguides** [8007-16]  
N. R. Fong, Carleton Univ. (Canada); P. Berini, Univ. of Ottawa (Canada); R. N. Tait, Carleton Univ. (Canada)
- 8007 1H **The effect of the target size on the optical response of ultrafine metallic spherical particles arranged in a two-dimensional array** [8007-26]  
M. Alsawafta, M. Wahbeh, S. Misra, V.-V. Truong, Concordia Univ. (Canada)
- 8007 1I **Optical properties of two-dimensional and three-dimensional arrays of noble metal nanoparticles by the discrete dipole approximation method** [8007-27]  
M. Wahbeh, M. Alsawafta, S. Misra, V.-V. Truong, Concordia Univ. (Canada)
- 8007 1J **Design of spectrometer for high-speed line field optical coherence tomography** [8007-51]  
M. Kamal, S. Narayanswamy, M. Packirisamy, Concordia Univ. (Canada)

- 8007 1K **Accurate characterization of doped semiconductors with terahertz spectroscopy** [8007-52]  
O. S. Ahmed, McMaster Univ. (Canada); M. A. Swillam, Univ. of Toronto (Canada); M. H. Bakr, X. Li, McMaster Univ. (Canada)
- 8007 1L **Athermal silicon subwavelength grating waveguides** [8007-65]  
M. Ibrahim, Carleton Univ. (Canada); J. H. Schmid, P. Cheben, J. Lapointe, S. Janz, P. J. Bock, A. Densmore, B. Lamontagne, R. Ma, D.-X. Xu, National Research Council Canada (Canada); W. N. Ye, Carleton Univ. (Canada)
- 8007 1M **1x3 power splitter based on 2D slab photonic crystal multiple line defect waveguides** [8007-77]  
R. Dey, J. Sabarinathan, The Univ. of Western Ontario (Canada)
- 8007 1N **A four-phonon Bragg anomalous light scattering in a tetragonal tellurium dioxide crystal** [8007-80]  
A. S. Shcherbakov, National Institute for Astrophysics, Optics and Electronics (Mexico); V. Yu. Rakovsky, State Polytechnic Univ. (Russian Federation); D. Sanchez Lucero, National Institute for Astrophysics, Optics and Electronics (Mexico); S. A. Nemov, State Polytechnic Univ. (Russian Federation)
- 8007 1O **Shaping triple correlations of low-power optical pulse trains and their experimental modeling via acousto-optic technique** [8007-182]  
A. S. Shcherbakov, National Institute for Astrophysics, Optics and Electronics (Mexico); J. Campos Acosta, CSIC-Institute for Applied Physics (Spain); A. V. Hanessian de la Graza, D. Sanchez Lucero, National Institute for Astrophysics, Optics and Electronics (Mexico)
- 8007 1P **Innovative architecture of switching device for expanding the applications in fiber to the home (FTTH)** [8007-214]  
M. Mahmoud, H. A. Fayed, M. H. Aly, Arab Academy for Science, Technology and Maritime Transport (Egypt); A. K. Aboul Seoud, Alexandria Univ. (Egypt)
- 8007 1Q **Asymmetric modified optical cross add drop multiplexer to eliminate crosstalk** [8007-215]  
M. Mahmoud, H. A. Fayed, M. H. Aly, Arab Academy for Science, Technology and Maritime Transport (Egypt); A. K. Aboul Seoud, Alexandria Univ. (Egypt)
- 8007 1R **Simulation of PDMS microcantilever deflection using integrated optical fibers** [8007-85]  
A. Sanati Nezhad, M. Ghanbari, C. Gustavo Agudelo, M. Packirisamy, R. Bhat, Concordia Univ. (Canada)

---

## PHOTOVOLTAICS

- 8007 1S **Relation between sodium addition and excess selenium in Bridgman-grown  $\text{CuInSe}_2$**  [8007-02]  
H. F. Myers, C. H. Champness, I. Shih, McGill Univ. (Canada)
- 8007 1T **Growth of large crystalline  $\text{CuInSe}_2$  ingots** [8007-03]  
J. Qiu, A. Shih, Y. F. Qi, S. Park, Z. Mi, I. Shih, McGill Univ. (Canada)



- 8007 1U **Surface relief diffraction gratings for plasmonic photocurrent enhancements in P3HT-PCBM solar cells** [8007-09]  
R. G. Sabat, Royal Military College of Canada (Canada); M. J. L. Santos, Univ. de São Paulo (Brazil); P. Rochon, Royal Military College of Canada (Canada)
- 8007 1V **Low density of gold nanorods in the anodic layer for enhancing the efficiency of organic solar cells** [8007-21]  
A. Y. Mahmoud, Concordia Univ. (Canada); J. Zhang, Institut National de la Recherche Scientifique (Canada); J. K. Baral, Concordia Univ. (Canada) and Univ. du Québec à Montréal (Canada); R. Izquierdo, Univ. du Québec à Montréal (Canada); D. Ma, Institut National de la Recherche Scientifique (Canada); M. Packirisamy, V.-V. Truong, Concordia Univ. (Canada)
- 8007 1W **Modeling of the electrical carrier transport in III-V on silicon tandem solar cell structures** [8007-25]  
T. K. Maiti, McMaster Univ. (Canada); D. Cheong, ARISE Technologies Corp. (Canada); J. Yang, R. N. Kleiman, McMaster Univ. (Canada)
- 8007 1X **Metal contacts to p-type crystalline CuInSe<sub>2</sub>** [8007-29]  
S. Park, C. H. Champness, Z. Mi, I. Shih, McGill Univ. (Canada)
- 8007 1Y **Thermal modelling of laser processing for silicon photovoltaics** [8007-31]  
C. Baldus-Jeursen, S. Sivoththaman, Univ. of Waterloo (Canada)
- 8007 1Z **Charge carrier mobility in conjugated organic polymers: simulation of an electron mobility in a carbazole-benzothiadiazole-based polymer** [8007-44]  
Y. Li, J. B. Lagowski, Memorial Univ. of Newfoundland (Canada)
- 8007 20 **Lowest surface recombination velocity on n-type crystalline silicon using PECVD a-Si:H/SiN<sub>x</sub> bi-layer passivation** [8007-56]  
D. S. Stepanov, Z. R. Chowdhury, N. P. Kherani, Univ. of Toronto (Canada)
- 8007 21 **Fe doped TiO<sub>2</sub> nanofibers on the surface of graphene sheets for photovoltaics applications** [8007-63]  
N. Farhangi, Y. Medina-Gonzalez, P. A. Charpentier, The Univ. of Western Ontario (Canada)
- 8007 22 **Thermal optimization of a solar cell carrier for concentrator systems** [8007-68]  
A. Muron, S. Chow, J. Wheeldon, K. Hinzer, H. Schriemer, Univ. of Ottawa (Canada)
- 8007 23 **Synthesis and properties of zinc oxide nanowires for photovoltaics** [8007-81]  
B. Janfeshan, S. Sivoththaman, Univ. of Waterloo (Canada)
- 8007 24 **Spatial and spectral non-uniform irradiance distribution effects on multijunction solar cells** [8007-84]  
M. Victoria, R. Herrero, C. Domínguez, I. Antón, S. Askins, G. Sala, Univ. Politécnica de Madrid (Spain)

- 8007 25 **Design of a multiplexer to characterize individual optics at a concentrating photovoltaic test site** [8007-183]  
M. Wilkins, R. Beal, J. E. Haysom, J. F. Wheeldon, P. Mulet, G. Jamieson, N. Youssef, Univ. of Ottawa (Canada); D. Balachandreswaran, J. Fan, Morgan Solar, Inc. (Canada); T. Hall, Univ. of Ottawa (Canada); S. Myrskog, Morgan Solar, Inc. (Canada); K. Hinzer, Univ. of Ottawa (Canada)
- 8007 26 **Building integrated semi-transparent photovoltaics: energy and daylighting performance** [8007-217]  
K. Kapsis, A. K. Athienitis, Concordia Univ. (Canada)

---

**ADDITIONAL PAPER FROM PHOTONIC AND OPTICAL DESIGN AND SIMULATION**

---

- 8007 29 **Design of a metal-dielectric subwavelength slit structure for high efficiency coupling of surface plasmon polaritons** [8007-218]  
R. Mehfuz, K. J. Chau, The Univ. of British Columbia (Canada)

*Author Index*

# Conference Committee

## *Conference Chair*

**Mike Scott**, Canadian Photonics Consortium (Canada)

## *Conference Vice Chair*

**George A. Lampropoulos**, A.U.G. Signals (Canada)

## *Exhibition Coordinator*

**Michel Walters**, Conferium (Canada)

## *Program Committee*

**Raman Kashyap**, Program Chair - Photonics North, Polytechnique de Montréal (Canada)

**Michel Têtu**, Program Cochair - Photonics North, Quebec Photonic Network (Canada)

**Rafael N. Kleiman**, Program Chair - Photovoltaics, McMaster University (Canada)

## *Session Chairs*

### Biophotonics

**Alexandre Brolo**, University of Victoria (Canada)

**Li-Lin Tay**, National Research Council Canada (Canada)

**John Girkin**, Durham University (United Kingdom)

### Clean Energy Photonics

**Ruth Rayman**, National Research Council Canada (Canada)

### Fibre Lasers and Amplifiers

**Richard Murison**, PyroPhotonics (Canada)

### Microwave Photonics

**Jianping Yao**, University of Ottawa (Canada)

### Ultrafast Photonics and Nano Optics

**Ravi Bhardawaj**, University of Ottawa (Canada)

**Frank Hegmann**, University of Alberta (Canada)

**David Villeneuve**, National Research Council Canada (Canada)

**Jean-Claude Kieffer**, INRS (Canada)

Optical Devices and Waveguides

**Roberto Morandotti**, INRS (Canada)

**Siegfried Janz**, National Research Council Canada (Canada)

**David Moss**, CUDOS (Canada)

**Marc Sorel**, University of Glasgow (United Kingdom)

**Peter Herman**, University of Toronto (Canada)

**Andrew G. Kirk**, McGill University (Canada)

**Alessia Pasquazi**, INRS (Canada)

Optical Trapping, Laser Heating, Cooling, and Nano-manipulation

**Raman Kashyap**, Polytechnique Montréal (Canada)

Optoelectronic and Integrated Devices and Networks

**Christine Tremblay**, École de technologie supérieure (Canada)

Photonic and Optical Design and Simulation

**Pavel Cheben**, National Research Council Canada (Canada)

**Jose Azana**, INRS (Canada)

**Jiri Ctyroky**, Institute of Photonics and Electronics of the ASCR, v.v.i.  
(Czech Republic)

**Andrea Meloni**, Politecnico di Milano (Italy)

**Simon Thibault**, Laval University (Canada)

Photovoltaics

**Rafael N. Kleiman**, McMaster University (Canada)

**Michel Côté**, Université de Montréal (Canada)

## Introduction

It is with great pleasure we welcome you to this proceedings of the SPIE supported conference, Photonics North 2011, held in Ottawa, 16–18 May 2011. This was yet another successful year for Photonics North, with 241 abstracts, attendees from 25 countries, and as well as 54 exhibitors with a delegation of French companies and a visiting delegation from China. This year saw the co-location of three conferences in Ottawa: Photonics North, Optical Fiber Sensors, and Information Photonics. Inevitably, these meetings not only drew a large audience altogether, but also fragmented the attendees into different interest groups. Additional common sessions could have eased some of the critical feedback received from the participants; certainly something to be addressed in future meetings.

We were greatly honored to have the Nobel Laureate Prof. John Hall deliver the keynote lecture on his contributions to “Time, Frequency and Timekeeping.” The enormity of the task was obvious from his wonderful slides, each of which could have delivered a two-hour lecture! Photonics North again hosted a successful session on Photovoltaics and we were honored to have Prof. Thomas Baer, past president of the Optical Society of America, present a plenary lecture on the prospects of photonics playing a role as a green technology. Prof. Paul Corkum gave an illuminating plenary talk on attosecond processes, as did Dr. Alex Vitkin on the photonics in biophotonics.

For the first time, the conference held a session on “Optical Trapping, Laser Heating, Cooling, and Nano-Manipulation,” and Prof. Dana Anderson opened the session with a fascinating invited talk on the atom transistor.

In these proceedings, you will see the diversity of topics that define photonics in Canada, describing the leading edge of research in high quality peer reviewed papers. The world community attending the meeting reflects the relevance of the Photonics North forum as it continues to remain an important networking and scientific platform serving not only North America but also the wider photonics community.

**Raman Kashyap**

