



Emerging Technologies

Communications Microsystems Optoelectronics Sensors

2018 Conference Program

May 9 - 11, 2018

Hilton Whistler Resort & Spa

Whistler, Canada



May 9, 2018

Session P1: Plenary I

8:30

Mt. Currie South

Chairs: André Ivanov, University of British Columbia (ivanov@ece.ubc.ca)

8:30 Mina Rais-Zadeh, University of Michigan (minar@umich.edu)

Microsensors and systems for missions to hot planets

9:00 Tetsuo Endoh, Tohoku University (tetsuo.endoh@cies.tohoku.ac.jp)

Impact of nonvolatile brain-inspired VLSIs with CMOS/MTJ hybrid technology

9:30 Sorin Voinigescu, University of Toronto (sorinv@ece.utoronto.ca)

Silicon device and circuit scaling to the end of the ITRS 2030 time Horizon and natural Evolution into Si QC at the Atomic Scale

10:00 COFFEE BREAK (Mt. Curie Foyer)

10:30 Drew Evans, University of South Australia (Drew.Evans@unisa.edu.au)

Emergence of organic electronic devices

11:00 Federico Rosei, INRS (rosei@emt.inrs.ca)

Multifunctional materials for emerging technologies

11:30 Rob Aitken, ARM (Rob.Aitken@arm.com)

What is ahead in 2018?

Session A1: Devices, Circuits and Systems

13:30

Sutcliffe A

**Chairs: Mohammad Darwish, Aplicata Technologies (mdarwish@aplicata.com)
Yushi Zhou, Lakehead University (yushi.zhou_u@yahoo.ca)**

13:30 Naoya Onizawa, Tohoku University (nonizawa@m.tohoku.ac.jp)

Energy-efficient brainware LSI based on stochastic computation

13:50 Arash Sheikholeslam, University of British Columbia (sarashs@ece.ubc.ca)

Proton transport and its effects on transistor aging

14:10 Hassan Maher, Université de Sherbrooke (hassan.maher@Usherbrooke.ca)

Normally-off GaN HEMT transistor for high power applications

14:30 Sarit Dhar, Auburn University (sarit_dhar@auburn.edu)

Silicon carbide MOSFET science and technology

14:50 Jia Di, University of Arkansas (jdi@uark.edu)

Advantages and applications of asynchronous circuits

15:10 COFFEE BREAK (Mt. Curie Foyer)

15:30 Fei Yuan, Ryerson University (fyuan@ryerson.ca)

All-digital time-mode approaches for mixed analog-digital signal processing

15:50 Seung-Tak Ryu, KAIST (stryu@kaist.ac.kr)

with J-H. Jang

Study on various ADC architectures with SAR ADCs

16:10 Ajith Amerasekera, University of California, Berkeley (amerasekera@berkeley.edu)

The future of connectivity

16:30 Amir Masnadi, University of British Columbia (amirms@ece.ubc.ca)

with S. Shekhar and S. Mirabbasi

Sub-THz to THz signal generators on CMOS: Techniques for improving DC-to-RF efficiency

Session B1: Nanoscale Devices and Technologies

13:30

Sutcliffe B

Chairs: Chair to be Announced

13:30 Maxime Hugues, CNRS-CRHEA (mh@crhea.cnrs.fr)

The development of AlGaN/GaN and ZnMgO/ZnO heterostructures for THz devices

13:50 Ji Ung Lee, SUNY Polytechnic Institute (jlee1@sunypoly.edu)

Reconfigurable logic devices in 2D materials

14:10 Matthew Spencer, Harvey Mudd College (mspencer@g.hmc.edu)

Evaluating electromechanical sequential logic

14:30 Fabrice Vallee, Université de Lyon (fabrice.vallee@univ-lyon1.fr)

with F. Medeghini, N. Del Fatti, A. Crut and P. Maioli

Control of mechanical energy damping at the nanoscale

14:50 COFFEE BREAK (Mt. Curie Foyer)

15:30 Toshiyuki Tsuchiya, Kyoto University (tutti@me.kyoto-u.ac.jp)

Measurement of energy carrier transportation across fracture fabricated nanogap on MEMS

15:50 Jan Dubowski, Université de Sherbrooke (Jan.J.Dubowski@USherbrooke.ca)

Electrical characterization of digitally photocorroding GaAs/AlGaAs quantum well microstructures

16:10 Edmond Cretu, University of British Columbia (edmondc@ece.ubc.ca)

with M. Manav and S. Phani

High sensitivity sensing through mode localization in weakly-coupled resonators

16:30 Krishna Saraswat, Stanford University (saraswat@stanford.edu)

Emerging interconnect technologies for nanoelectronics

Session C1: Quantum Computing and Photonics

13:30

Cheakamus

Chairs: Lukas Chrostowski, University of British Columbia (lukasc.ubc@gmail.com)

13:30 Marek Korkusinski, National Research Council (Marek.Korkusinski@nrc-cnrc.gc.ca)
with S. Studenikin, A. Bogan, L. Gaudreau, G. Aers, P. Zawadzki, A. Sachrajda, L. Tracy, J. Reno and T. Hargett

Advances in the coherent control of holes in gated lateral quantum dots

13:50 Stephanie Simmons, Simon Fraser University (s.simmons@sfu.ca)

A photonic link for donor spin qubits in silicon

14:10 Mark Eriksson, University of Wisconsin-Madison (maeriksson@wisc.edu)

Controlling the coupling of silicon qubits to their noise environments

14:30 Paul Barclay, University of Calgary (pbarclay@ucalgary.ca)

Diamond optomechanical devices for quantum nanophotonics

14:50 Benoit Bertrand, CEA (Benoit.BERTRAND@cea.fr)

with L. Hutin, R. Maurand, M. Urdampilleta, B. Jadot, H. Bohuslavskiy, L. Bourdet, Y.-M. Niquet, X. Jehl, S. Barraud, C. Bäuerle, T. Meunier, M. Sanquer, S. De Franceschi and M. Vinet

Using Si CMOS technology as a platform for quantum computing

15:10 COFFEE BREAK (Mt. Curie Foyer)

15:30 Jonathan Baugh, University of Waterloo (baugh@uwaterloo.ca)

A network architecture for silicon quantum computing

15:50 Philipp Niemann, DFKI (Philipp.Niemann@dfki.de)

Compact representations for the design of quantum logic

16:10 Ellen Schelew, Lumerical Inc. (eschelew@lumerical.com)

Design, simulation and optimization of photonic components and systems for quantum applications

16:30 Edoardo Charbon, EPFL, Technische Universität Delft (e.charbon@tudelft.nl)

From SPADs for quantum sensing to cryo-CMOS interfaces for quantum computing

16:50 Jeff Young, University of British Columbia (young@phas.ubc.ca)

Cavity-quantum-electrodynamic-based quantum information processing elements in silicon photonic circuits

Session D1: Thin Film Devices and Electronics

13:30

Diamond Head

Chairs: Zhehui (Jeph) Wang, Los Alamos National Laboratory (zwang@lanl.gov)

13:30 Sheng Xu, University of California, San Diego (shengxu@ucsd.edu)

A hybridized approach to soft electronics: materials design and advanced microfabrication

13:50 Joachim Burghartz, Institut für Mikroelektronik Stuttgart (burghartz@ims-chips.de)

Hybrid Systems-in-Foil (HySiF) – enabler of flexible electronics

14:10 Christopher Künneth, Munich University of Applied Sciences (christopher.kuenneth@googlemail.com)

Explaining the ferroelectricity and pyroelectricity in HfO₂ and ZrO₂ thin films from an interface driven size effect with DFT

14:30 Serge Oktyabrsky, SUNY Polytechnic Institute (soktyabrsky@sunypoly.edu)

with K. Dropiewski, M. Yakimov, V. Tokranov and P. Murat

Ultrafast scintillation detector based on waveguiding nanomaterial

14:50 COFFEE BREAK (Mt. Curie Foyer)

15:30 Hagen Klauk, Max Planck Institute for Solid State Research (h.klauk@fkf.mpg.de)

Submicron-channel-length organic thin-film transistors

15:50 Kyung-In Jang, Daegu Gyeongbuk Institute of Science and Technology (kijang@dgist.ac.kr)

Skin-mountable electronic patches for the human

16:10 Weng W. Chow, Sandia National Laboratories (wwchow@sandia.gov)

Semiconductor micro- and nano-lasers

16:30 Zhehui (Jeph) Wang, Los Alamos National Laboratory (zwang@lanl.gov)

Thin film detector technology, from ultracold to ultrafast applications

Session E1: Advanced Materials

13:30

Mt. Currie South

Chairs: Yi-Hwa Liu, Yale University (yi-hwa.liu@yale.edu)

Karen Kavanagh, Simon Fraser University (kavanagh@sfu.ca)

13:30 Rehan Kapadia, University of Southern California (rkapadia@usc.edu)

Compound semiconductors on anything

13:50 Giuseppe Greco, National Research Council, Italy (giuseppe.greco@imm.cnr.it)

with E. Schilirò, R. Lo Nigro, I. Deretzis, A. La Magna, G. Nicotra, F. Roccaforte, F. Iucolano, S. Ravesi, P. Prystawko, P. Kruszewski, M. Leszczyński, R. Dagher, E. Frayssinet, A. Michon, Y. Cordier, and F. Giannazzo

2D materials integration with nitrides for high frequency applications

14:10 Guangrui (Maggie) Xia, University of British Columbia (gxia@mail.ubc.ca)

Thermal thinning and Raman spectroscopy in the study of 2D black phosphorus

14:30 Antoine Fleurence, Japan Advanced Institute of Science and Technology (antoine@jaist.ac.jp)

Epitaxial silicene on ZrB₂(0001): a 2D allotrope of silicon

14:50 Feng Xiong, University of Pittsburgh (f.xiong@pitt.edu)

Tuning electrical and thermal transport in two-dimensional materials via electrochemical intercalation

15:10 COFFEE BREAK (Mt. Curie Foyer)

15:30 Byron Gates, Simon Fraser University (bgates@sfu.ca)

Extending the strategies for modifying the surfaces of semiconductor materials and devices

15:50 Faisal Mohd-Yasin, Griffith University (f.mohd-yasin@griffith.edu.au)

Sputtered AlN and ZnO thin films on 3C-SiC/Si substrates for piezoelectric applications

16:10 Yvon Cordier, Centre National de la Recherche Scientifique (Yvon.Cordier@crhea.cnrs.fr)

with Y. Cordier, R. Comyn, E. Frayssinet, M. Leseq, N. Defrance and J-C. DeJaeger

On the advantages of a lower growth temperature for GaN HEMTs on Silicon

16:30 Marco Rahm, Technische Universität Kaiserslautern (marco.rahm@eit.uni-kl.de)

with J. Kappa, K.M. Schmitt and D. Sokoluk

Grating modulators for terahertz coded aperture imaging

May 10, 2018

Session A2: Memories and Computing

9:00

Sutcliffe A

Chairs: **Mohammad Darwish, Aplicata Technologies (mdarwish@aplicata.com)**

9:00 Tosiron Adegbija, University of Arizona (tosiron@email.arizona.edu)

Potentials of microarchitecture adaptability for performance, energy, and security optimizations

9:20 Ajay Joshi, Boston University (joshi@bu.edu)

Electro-photonic NoC designs for kilocore systems

9:40 Zhengya Zhang, University of Michigan (zhengya@umich.edu)

Spiking neural net accelerators for embedded computer vision applications

10:00 COFFEE BREAK (Mt. Curie Foyer)

10:40 Massimiliano Di Ventra, University of California, San Diego (diventra@physics.ucsd.edu)

Memcomputing: a brain-inspired efficient computing paradigm

11:00 Alessandro Paccagnella, Università degli Studi di Padova (alessandro.paccagnella@dei.unipd.it)

Non-volatile memories for space applications: from planar to 3D devices

11:20 Jean-Philippe Noel, CEA-LETI (noeljp85@gmail.com)

Smart memory solutions for emerging technologies

Session B2: Next-Generation Wireless

9:00

Sutcliffe B

Chairs: Peter Wilson, Alpha & Omega Semiconductor (peterhwilson@msn.com)

9:00 Eran Socher, Tel-Aviv University (socher@eng.tau.ac.il)

THz CMOS radiating transceivers and arrays for future connectivity and sensing

9:20 Farhana Sheikh, Intel (engenia@gmail.com)

Adaptive and multi-mode baseband systems for next generation wireless communication

9:40 Suraj Prakash, Texas A&M University (prakash.suraj1111@gmail.com)

Energy-efficient envelope tracking in RF power amplifier for demanding wireless standard

10:00 Joy Laskar, Maja Systems (joylaskar@gmail.com)

with R. Pelard and J. Sevic

mmW CMOS products for terabit connectivity

10:20 COFFEE BREAK (Mt. Curie Foyer)

10:40 Yahya Tousi, University of Minnesota (ymtousi@umn.edu)

Integrated phased arrays for next-generation mm-wave and sub-mm-wave wireless systems

11:00 Syed Kamrul Islam, University of Tennessee, Knoxville (sislam@utk.edu)

with I. Mahbub

Low-power wireless wearable sensors: past trends and future directions

11:20 Morris Repeta, Huawei (Morris.Repeta@huawei.com)

5G mm-wave ultra-large-scale-array integration technology

11:40 Masum Hossain, University of Alberta (masum@ualberta.ca)

Affordable digital beamforming for 5G wireless

Session C2: Sensors

9:00

Cheakamus

Chairs: Fabio Di Francesco, Università di Pisa (fabio.difrancesco@unipi.it)

9:00 Sigurd Wagner, Princeton University (wagner@princeton.edu)
with T. Moy, Y. Afsar, L. Aygun, Y. Mehlman, J.C. Sturm and N. Verma

Thin-film circuits for interfacing large-area sensor arrays and CMOS circuits

9:20 Lado Filipovic, Technische Universität Wien (filipovic@iue.tuwien.ac.at)

CMOS-compatible semiconductor-based gas sensors

9:40 Yves-Alain Peter, École Polytechnique de Montréal (yves-alain.peter@polymtl.ca)

Gas sensing with optical microresonators

10:00 Chi Xiong, IBM (cxiong@us.ibm.com)

Monolithically integrated silicon photonic gas sensors

10:20 COFFEE BREAK (Mt. Curie Foyer)

10:40 Justin Caram, University of California, Los Angeles (jcaram@chem.ucla.edu)

Probing new chemistry in the shortwave infrared using superconducting nanowire single photon detectors

11:00 Jim Booth, British Columbia Institute of Technology (James_Booth@bcit.ca)

with P. Shen and K. Madison

Defining pressure -- cold atom technology for high- and ultra-high vacuum pressure metrology

11:20 Seiji Kajihara, Kyushu Institute of Technology (kajihara@cse.kyutech.ac.jp)

A full digital temperature and voltage sensor for field testing

11:40 Bhaskar Choubey, University of Oxford (bhaskar.choubey@eng.ox.ac.uk)

Increasing the M/NEMS Sensors population per chip

Session B3: Wireless and IoT Technologies

13:30

Sutcliffe B

Chairs: Chair to be Announced

13:30 Antonio Liscidini, University of Toronto (antonio.liscidini@utoronto.ca)

Complex poles with passive switched capacitor filters

13:50 Shuhei Amakawa, Hiroshima University (amakawa@hiroshima-u.ac.jp)

Feedback network design for transistor operating near its performance limit

14:10 Arun Natarajan, Oregon State University (nataraja@eecs.oregonstate.edu)

Reconfigurable code/frequency/spatial filtering for full-duplex and frequency-domain duplex MIMO arrays

14:30 Rouzbeh Kananizadeh, University of California, Davis (rkanani@ucdavis.edu)

Harmonic boosting in solid state circuits using harmonic positive feedback

14:50 Aatmesh Shrivastava, Northeastern University (aatmesh@ece.neu.edu)

Lifetime improvement of ultra-low power IoT devices

15:10 Manos Tentzeris, Georgia Tech (etentze@ece.gatech.edu)

3D/4D-printed smart wireless packages, energy harvesters, sensors and modules up to mmW

Session C3: Optics and Photonics

13:30

Cheakamus

Chairs: Sudip Shekhar, University of British Columbia (sudip@ece.ubc.ca)
Peter Bermel, Purdue University (pbermel@purdue.edu)

13:30 Jonathan Bradley, McMaster University (jbradley@mcmaster.ca)
Rare-earth-doped light-emitting thin films and photonic devices on silicon

13:50 Tohru Ishihara, Kyoto University (ishihara@i.kyoto-u.ac.jp)
Nanophotonic arithmetic and logic circuits toward optical in-network computation

14:10 Mike Jackson, Arius Technology (mjackson@ariustechnology.com)
Challenges in 3D Color Reproduction of Fine Art

14:30 Nathaniel Kinsey, Virginia Commonwealth University (nkinsey@vcu.edu)
Applications for emerging materials in nonlinear optics and integrated photonics

14:50 Karin Hinzer, University of Ottawa (khinzer@uottawa.ca)
High efficiency photovoltaics

15:10 COFFEE BREAK (Mt. Curie Foyer)

15:30 Lukas Chrostowski, University of British Columbia (lukasc.ubc@gmail.com)
Sub-wavelength silicon photonics and applications

15:50 Pablo Bianucci, Concordia University (pablo.bianucci@concordia.ca)
A topological nanobeam microcavity

16:10 James A. Lott, Technische Universität Berlin (lott@mailbox.tu-berlin.de)
with G. Larisch and D. Bimberg
Surface emitting lasers for a green internet

16:30 Andy Knights, McMaster University (aknight@mcmaster.ca)
with Z. Wang
Resonance control of a silicon micro-ring resonator modulator without the requirement for heterogeneous integration

16:50 Douglas M. Gill, IBM (dmgill@us.ibm.com)

Making short reach link transmitter Figure of Merits cognizant of transmission format

17:10 Hengky Chandralim, Air Force Institute of Technology (Hengky.Chandralim@afit.edu)

Sustainable whispering-gallery ring laser sensors

Session D3: Medical Technologies

13:30

Diamond Head

Chairs: William Barber, Rapiscan Technologies (william.barber@rapiscansystems.com)

- 13:30 Fabio Di Francesco, Università di Pisa (fabio.difrancesco@unipi.it)
with D. Biagini, S. Ghimenti, T. Lomonaco, F. Bellagambi, A. Bonini, P. Salvo, F. Vivaldi and R. Fuoco
Minimally invasive health monitoring
- 13:50 Syed Anas Imitiaz, Imperial College London (anas.imtiaz@imperial.ac.uk)
An ultra-low power system for wearable sleep monitoring and diagnosis
- 14:10 Bonnie Gray, Simon Fraser University (bgray@sfu.ca)
Flexible and reconfigurable microfluidic platforms for applications in biology and medicine
- 14:30 Francois Rivet, Université de Bordeaux (francois.rivet@ims-bordeaux.fr)
Intra-body communications - why not use ultrasounds instead of radio frequency
- 14:50 Soojin Lee, University of British Columbia (soojin.lee.e@gmail.com)
Engineering approaches to non-invasive electrical stimulation of the brain: application to Parkinson's disease
- 15:10 COFFEE BREAK (Mt. Curie Foyer)

- 15:30 Ross Walker, University of Utah (ross.walker@utah.edu)
Direct neural interfaces for medical and non-medical applications
- 15:50 Yang Sheng, University of Illinois at Urbana-Champaign (shengy3@illinois.edu)
Improving count rate and sensitivity in cross-strip cadmium zinc telluride detectors
- 16:10 Ferruccio Pisanello, Istituto Italiano di Tecnologia (ferruccio.pisanello@iit.it)
Micro and nanotechnologies for multipoint control of neural activity in deep brain regions
- 16:30 Thomas Webster, Northeastern University (th.webster@neu.edu)
Design, fabricating, and commercializing in-the-body nano sensors: the future of health
- 16:50 Peyman Servati, University of British Columbia (peymans@ece.ubc.ca)
Smart textile innovations for technology connected health (STITCH)

Thursday, May 10, 2018

17:10 Mirza Faisal Beg, Simon Fraser University (mfbeg@sfu.ca)

Measuring structure and function from medical images

Session E3: Nanomaterials and Energy Technologies

13:30

Mt. Currie South

**Chairs: Guangrui (Maggie) Xia, University of British Columbia (gxia@mail.ubc.ca)
John Madden, University of British Columbia (jmadden@ece.ubc.ca)**

13:30 Terry J. Hendricks, NASA (terry.j.hendricks@jpl.nasa.gov)

A universe of energy: emerging technologies to expand our energy "toolbox" for planet earth, our solar system, and beyond

13:50 Adam Duong, Université du Québec à Trois Rivières (Adam.Duong@uqtr.ca)

Materials design for the development of energy and nanotechnology

14:10 Andrzej Moscicki, Amepox Microelectronics Ltd. (amepox@amepox.com.pl)
with A. Kinart and M. Abo Ras

New thermal management solution with sinterable TIM materials

14:30 Gary Leach, Simon Fraser University (gleach@sfu.ca)

New strategies for single crystal plasmonic nanostructures and plasmon-based solar energy harvesting

14:50 Michael Adachi, Simon Fraser University (mmadachi@sfu.ca)

Colloidal quantum dot lasers and solar cells

15:10 COFFEE BREAK (Mt. Curie Foyer)

15:30 John Madden, University of British Columbia (jmadden@ece.ubc.ca)

Ionic skin--towards smart, compliant and active skin for robots and wearables

15:50 Karen Kavanagh, Simon Fraser University (kavanagh@sfu.ca)

Transmission He ion microscopy

16:10 Shankar Ranavare, Portland State University (ranavas@pdx.edu)
with S.R. Darmakkolla

Prospects of copper nanowire self-assembly for interconnect applications

16:30 D. Keith Roper, University of Arkansas (dkroper@uark.edu)

Nanoantenna augment carrier dynamics and wavelength mixing in two dimensional semiconductor nanocrystals

16:50 Aida Todri-Sanial, Centre National de la Recherche Scientifique (aida.todri@lirmm.fr)

Charge-based doping of carbon nanotubes as back-end-of-line interconnect material

Session N1: Networking Reception

18:30

Mt. Currie North

Chairs: André Ivanov, University of British Columbia (ivanov@ece.ubc.ca)

: No Speaker

May 11, 2018

Session A4: Circuits and Systems Design and Manufacture

9:00

Sutcliffe A

Chairs: Peter Wilson, Alpha & Omega Semiconductor (peterhwilson@msn.com)

9:00 Gord Harling, CMC Microsystems (gharling@innotime.ca)

TBA

9:20 Laleh Behjat, University of Calgary (laleh@ucalgary.ca)

From extremely large to super small scale: how optimization is used in the electronic design automation

9:40 Takashi Matsukawa, National Institute of Advanced Industrial Science and Technology (t-matsu@aist.go.jp)

Process challenges for further scaling of FinFETs

10:00 Gene A. Frantz, Octavo Systems LLC (gene.frantz@octavosystems.com)
with M. Murtuza

The next frontier of integration: the system in a package

10:20 COFFEE BREAK (Mt. Curie Foyer)

10:40 Maciej Ogorzalek, Uniwersytet Jagiellonski Krakow (maciej.ogorzalek@uj.edu.pl)
with K. Grzesiak-Kopec

Behavior-oriented 3D IC layout design

11:00 Sidney Tsai, IBM (htsai@us.ibm.com)

Neuromorphic hardware acceleration of neural network training using analog memory

11:20 Jacques C. Rudell, University of Washington (jcrudell@u.washington.edu)

Integrated CMOS transceivers design towards flexible full duplex (FD) and half duplex (HD) wireless systems

11:40 Shamik Das, Mitre Corporation (sdas@mitre.org)

Performance assessment of gapless graphene logic circuit designs

Session B4: Advanced Prosthetics and Soft Robotics

9:00

Sutcliffe B

**Chairs: John Madden, University of British Columbia (jmadden@ece.ubc.ca)
Carlo Menon, Simon Fraser University (cmenon@sfu.ca)**

9:00 Carlo Menon, Simon Fraser University (cmenon@sfu.ca)

Force myography: exploratory investigations

9:20 Michael Goldfarb, Vanderbilt University (michael.goldfarb@vanderbilt.edu)

Leveraging movement synergies to enhance the control of myoelectric prostheses

9:40 Gursel Alici, University of Wollongong (gursel@uow.edu.au)

Soft robotics for prosthetic devices; research challenges and opportunities

10:00 Ahmed Shehata, University of Alberta (shehata@ualberta.ca)

Towards better prosthesis control: Using sensory feedback to improve performance

10:20 COFFEE BREAK (Mt. Curie Foyer)

10:40 Benoit Delhay, University of Chicago (delhayeben@gmail.com)

Restoring natural tactile feedback in bionic hands through a peripheral nerve interface

11:00 Dan Blustein, University of New Brunswick (dan.blu@unb.ca)

Towards improved neuroprostheses: using computational neuroscience to drive system development

11:20 Maysam Ghovanloo, Georgia Tech (mgh@gatech.edu)

Fundamental building blocks for efficient power and wideband data transmission to mm-sized implantable microelectronic devices

11:40 Axel Guenther, University of Toronto (guenther@mie.utoronto.ca)

From protein-based planar and tubular structures to biohybrid systems

12:00 J. Matt Kinsella, McGill University (joseph.kinsella@mcgill.ca)

Session C4: Radiation Detection and Imaging

9:00

Cheakamus

Chairs: Jan Iwanczyk, DxRay, Inc. (jan.iwanczyk@dxray.com)

9:00 Paul Lecoq, CERN-European Organization for Nuclear Research (paul.lecoq@cern.ch)
A metamaterial approach to reach 10 ps timing resolution with a scintillator-based detector

9:20 Maurice Garcia-Sciveres, Lawrence Berkeley National Laboratory (mgarcia-sciveres@lbl.gov)
Challenges of high rate and radiation "imaging" in particle physics

9:40 Yi-Hwa Liu, Yale University (yi-hwa.liu@yale.edu)
Near-field coded aperture imaging: potential for high-sensitivity and high-resolution SPECT

10:00 William Barber, Rapiscan Technologies (william.barber@rapiscansystems.com)
Edge illuminated direct conversion semiconductor X-ray imaging detectors

10:20 COFFEE BREAK (Mt. Curie Foyer)

10:40 Chin-Tu Chen, University of Chicago (chintuchen@gmail.com)
with C. Kao, L. Leoni, H. Zhang, S. Cheng, M. Bhuiyan, N. Chen, N. Eclov, H. Kim, J. George, B. Quigley, H. Tsai, A. Kucharski, J. Souris, C. Pelizzari, R. Freifelder, I. Balyasnikova, L. Meng, P. La Riviere and L. Lo
Imaging-guided X-ray induced photodynamic therapy (XPDT) using novel nanoparticles

11:00 Jan Dudak, Czech Technical University in Prague (jan.dudak@cvut.cz)
with J. Karch and J. Zemlicka
Sub-micron resolution X-ray imaging using large-area photon counting detector Timepix

11:20 Magdalena Bazalova-Carter, University of Victoria (bazalova@uvic.ca)
X-ray fluorescence CT imaging: a new way of viewing gold

11:40 Vesna Sossi, University of British Columbia (vesna@phas.ubc.ca)
Advances in PET/MR multimodality imaging: relevance to the study of brain function

12:00 Toru Aoki, Shizuoka University (aoki.toru@shizuoka.ac.jp)
with K. Takagi, T. Takagi, T. Okunoyama and A. Koike
High count rate CdTe photon counting imaging sensor

Session D4: Biotechnology

9:00

Diamond Head

Chairs: Chair to be Announced

9:00 Edmond W.K. Young, University of Toronto (eyoung@mie.utoronto.ca)

Transitioning biomicrofluidic systems from PDMS to plastics

9:20 Takashi Tokuda, NAIST (tokuda@ms.naist.jp)

with M. Haruta, T. Noda, K. Sasagawa and J. Ohta

CMOS-based implantable optogenetic neural interfacing devices

9:40 Fabio Cicoira, École Polytechnique de Montréal (fabio.cicoira@polymtl.ca)

Conducting polymers for flexible, stretchable and healable electronics

10:00 Massimo De Vittorio, Università del Salento (massimo.devittorio@unisalento.it)

Thin flexible piezoelectrics for health and energy

10:20 Paul Li, Simon Fraser University (paulli@sfu.ca)

Microfluidic nanotechnology for analyzing proteins, nucleic acids and cells in biological samples

Session E4: Optical Materials and Photovoltaics

9:00

Mt. Currie South

Chairs: Guangrui (Maggie) Xia, University of British Columbia (gxia@mail.ubc.ca)

9:00 Magnus Borgström, Lund University (magnus.borgstrom@ftf.lth.se)

Nanowires for tandem junction solar cells

9:20 Daichi Suzuki, Tokyo Institute of Technology (daichi.suzuki.ak@riken.jp)

Multi-view terahertz imaging with nano-carbon flexible scanners

9:40 François Léonard, Sandia National Laboratories (fleonar@sandia.gov)

Inkjet printed terahertz detector

10:00 COFFEE BREAK (Mt. Curie Foyer)

10:40 Peter Bermel, Purdue University (pbermel@purdue.edu)

Toward an integrated system for compact solar thermophotovoltaic generation

11:00 Antonio Agresti, Università degli Studi di Roma "Tor Vergata" (antonio.agresti@uniroma2.it)
with S. Pescetelli, F. Bonaccorso, A. Di Carlo¹

Perovskite and 2D materials: a winning paradigm for new generation photovoltaics

11:20 Stefano Gregori, University of Guelph (sgregori@uoguelph.ca)

Energy conversion and harvesting in low-power systems

11:40 Han Yun, University of British Columbia (hany@ece.ubc.ca)

with N. Jaeger

Broadband optical power splitters for integrated photonic circuits using Si metamaterial on an SOI platform

Session P2: Plenary II

13:30

Mt. Currie South

Chairs: Chair to be Announced

13:30 Kourosh Kalantar-Zadeh, RMIT University (kourosh.kalantar@rmit.edu.au)

Outcomes of first human trial on ingestible gas sensing capsules

14:00 Gregory Snider, University of Notre Dame (snider.7@nd.edu)

Adiabatic reversible computation for ultra-low power

14:30 Juan Rey, Mentor Graphics (juan_rey@mentor.com)

We are glad "you people" did not hear Moore's Law is dead

15:00 COFFEE BREAK (Mt. Curie Foyer)

15:30 Mark Johnson, D-Wave Systems (mwjohnson@dwavesys.com)

Quantum annealing: a practical approach to quantum computing

16:00 Purang Abolmaesumi, University of British Columbia (purang@ece.ubc.ca)

Advanced machine learning for ultrasound guided diagnosis and intervention

16:30 Ricardo Reis, Universidade Federal do Rio Grande do Sul (reis@inf.ufrgs.br)

Low-power issues in IoE

Session B5: Roundtable Discussion: UBC Bionics Cluster

13:30

Sutcliffe B

Chairs: John Madden, University of British Columbia (jmadden@ece.ubc.ca)

Carlo Menon, Simon Fraser University (cmenon@sfu.ca)

13:30 Speakers To Be Announced



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