



*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 North

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 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*

9:30 Matteo Rinaldi, Northeastern University (rinaldi@ece.neu.edu)

*Zero-power infrared digitizers based on plasmonically enhanced micromechanical photoswitches*

10:00 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

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

*Emergence of organic electronic devices*

11:00 Rob Aitken, ARM (Rob.Aitken@arm.com)

*What is ahead in 2018?*

11:30 Federico Rosei, INRS (rosei@emt.inrs.ca)

*Multifunctional materials for emerging technologies*

**Session A1: Devices, Circuits and Systems**

**13:30**

**Mt. Currie North**

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

**Yushi Zhou, Lakehead University (qiezhys@gmail.com)**

13:30 Tetsuo Endoh, Tohoku University (tetsuo.endoh@cies.tohoku.ac.jp)

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

13:50 Carlos Galup Montoro, Universidade Federal de Santa Catarina (carlosgalup@gmail.com)

*Ultra low voltage/power LNA and mixers*

14:10 Naoya Onizawa, Tohoku University (nonizawa@m.tohoku.ac.jp)

*Energy-efficient brainware LSI based on stochastic computation*

14:30 Arash Sheikholeslam, University of British Columbia (sarashs@ece.ubc.ca)

*Proton transport and its effects on transistor aging*

14:50 Hassan Maher, Université de Sherbrooke (hassan.maher@Usherbrooke.ca)

*Normally-off GaN HEMT transistor for high power applications*

15:10 Sarit Dhar, Auburn University (sarit\_dhar@auburn.edu)

*Silicon carbide MOSFET science and technology*

15:30 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:50 Jia Di, University of Arkansas (jdi@uark.edu)

*Advantages and applications of asynchronous circuits*

16:10 Fei Yuan, Ryerson University (fyuan@ryerson.ca)

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

16:30 Seung-Tak Ryu, KAIST (stryu@kaist.ac.kr)

with J-H. Jang

*Study on various ADC architectures with SAR ADCs*

16:50 Amir Masnadi, University of British Columbia (amirms@ece.ubc.ca)

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

Wednesday, May 9, 2018

17:10 Ramesh Harjani, University of Minnesota (harjani@umn.edu)  
with S. Chaubey

*Ultra low voltage LDO regulator design*

**Session B1: Nanoscale Devices and MEMS**

**13:30**

**Mt. Currie South**

**Chairs: Chair to be Announced**

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

*The development of AlGa<sub>N</sub>/Ga<sub>N</sub> 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 Andreas Ruediger, INRS (ruediger@emt.inrs.ca)

*CMOS compatible ferroelectric tunnel junctions*

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

*Measurement of energy carrier transportation across fracture fabricated nanogap on MEMS*

15:10 Jan Dubowski, Université de Sherbrooke (Jan.J.Dubowski@USherbrooke.ca)

*Open circuit potential of digitally photocorroding GaAs/AlGaAs quantum well microstructures*

15:30 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:50 Victor M. Castaño, Universidad Autónoma de México (vmcastano@unam.mx)

*MEMS and NEMS for advanced sensing of re-emerging diseases*

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

*From symmetry breaking to high sensitivity sensing in weakly-coupled resonators*

16:30 Matthew Spencer, Harvey Mudd College (mspencer@g.hmc.edu)

*Evaluating electromechanical sequential logic*

16:50 Raafat Mansour, University of Waterloo (raafat.mansour@ece.uwaterloo.ca)

*Integrated atomic force microscope/scanning microwave microscope on a single CMOS-MEMS chip*

**Session C1: Quantum Computing and Photonics**

**13:30**

**Diamond Head**

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

13:30 Michael Adachi, Simon Fraser University (mmadachi@sfu.ca)

*Colloidal quantum dot lasers and solar cells*

13:50 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*

14:10 Stephanie Simmons, Simon Fraser University (s.simmons@sfu.ca)

*A photonic link for donor spin qubits in silicon*

14:30 Mark Eriksson, University of Wisconsin-Madison (maeriksson@wisc.edu)

*Controlling the coupling of silicon qubits to their noise environments*

14:50 Paul Barclay, University of Calgary (pbarclay@ucalgary.ca)

*Diamond optomechanical devices for quantum nanophotonics*

15:10 Benoit Bertrand, CEA (Benoit.BERTRAND@cea.fr)

with L. Hutin, R. Maurand, M. Urdampilleta, B. Jadot, H. Bohuslavskyi, 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*

15:30 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:50 Jonathan Baugh, University of Waterloo (baugh@uwaterloo.ca)

*A network architecture for silicon quantum computing*

16:10 Philipp Niemann, DFKI (Philipp.Niemann@dfki.de)

*Compact representations for the design of quantum logic*

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

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

17:10 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**

**Sutcliffe A**

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

13:30 Sebastjan Glinsek, LIST (sebastjan.glinsek@list.lu)

*Transparent piezoelectric thin films on glass for transducer applications*

13:50 Sheng Xu, University of California, San Diego (shengxu@ucsd.edu)

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

14:10 Kyung-In Jang, Daegu Gyeongbuk Institute of Science and Technology (kijang@dgist.ac.kr)

*Skin-mountable electronic patches for the human*

14:30 Joachim Burghartz, Institut für Mikroelektronik Stuttgart (burghartz@ims-chips.de)

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

14:50 Moon J. Kim, University of Texas at Dallas (moonkim@utdallas.edu)

*New and emerging 2D materials for nano-electronics*

15:10 Christopher Künneth, Munich University of Applied Sciences (christopher.kuenneth@googlemail.com)

*Explaining the ferroelectricity and pyroelectricity in HfO<sub>2</sub> and ZrO<sub>2</sub> thin films from an interface driven size effect with DFT*

15:30 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:50 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*

16:10 Hagen Klauk, Max Planck Institute for Solid State Research (h.klauk@fkf.mpg.de)

*Submicron-channel-length organic thin-film transistors*

16:30 Weng W. Chow, Sandia National Laboratories (wwchow@sandia.gov)

*Semiconductor micro- and nano-lasers*

16:50 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**

**Sutcliffe B**

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

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 ZrB<sub>2</sub>(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 Byron Gates, Simon Fraser University (bgates@sfu.ca)

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

15:30 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

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 Hasina Huq, University of Texas Rio Grande Valley (hasina.huq@utrgv.edu)

with H. Orta and J. Castillo

*Investigation of gallium-based thin films for bio-sensor applications*

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*

16:50 Toru Aoki, Shizuoka University (rtaoki@ipc.shizuoka.ac.jp)

with K. Takagi, T. Takagi, T. Okunoyama and A. Koike

*High count rate CdTe photon counting imaging sensor*

17:10 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*

## May 10, 2018

### Session A2: Memories and Computing

9:00

Mt. Currie North

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

9:00 Kerem Camsari, Purdue University (kcamsari@purdue.edu)

*Stochastic p-bits for invertible logic*

9:20 Tosiron Adegbija, University of Arizona (tosiron@email.arizona.edu)

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

9:40 Ajay Joshi, Boston University (joshi@bu.edu)

*Electro-photonic NoC designs for kilocore systems*

10:00 Massimiliano Di Ventra, University of California, San Diego (diventra@physics.ucsd.edu)

*Memcomputing: a brain-inspired efficient computing paradigm*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Bastien Giraud, CEA (bastien.giraud@cea.fr)

*Smart memory solutions for emerging technologies*

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

*Spiking neural net accelerators for embedded computer vision applications*

**Session B2: Next-Generation Wireless**

**9:00**

**Mt. Currie South**

**Chairs: Chair to be Announced**

9:00 Masum Hossain, University of Alberta (masum@ualberta.ca)

*Affordable digital beam forming techniques for 5G wireless*

9:20 Morris Repeta, Huawei (Morris.Repeta@huawei.com)

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

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, Sutcliffe 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 Farhana Sheikh, Intel (engenia@gmail.com)

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

11:40 Eran Socher, Tel-Aviv University (socher@eng.tau.ac.il)

*THz CMOS radiating transceivers and arrays for future connectivity and sensing*

**Session C2: Sensors**

**9:00**

**Diamond Head**

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

9:00 How-Foo Chen, National Yang Ming University (howfoochen@gmail.com)  
with C-Ha. Chen and P-B. Wang

*Designing and fabricating a medical surface plasmon resonance biosensor: application on antimicrobial susceptibility test of E. Coli*

9:20 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*

9:40 Lado Filipovic, Technische Universität Wien (filipovic@iue.tuwien.ac.at)

*CMOS-compatible semiconductor-based gas sensors*

10:00 Yves-Alain Peter, École Polytechnique de Montréal (yves-alain.peter@polymtl.ca)

*Gas sensing with optical microresonators*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Chi Xiong, IBM (cxiong@us.ibm.com)

*Monolithically integrated silicon photonic gas sensors*

11:00 Justin Caram, University of California, Los Angeles (jcaram@chem.ucla.edu)

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

11:20 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 D2: Digital Revolution and IoT**

**9:00**

**Sutcliffe A**

**Chairs: Chair to be Announced**

9:00 Bob Merritt, Convergent Semiconductors (bobm@convergentsemiconductors.com)

*The digital revolution goes world wide*

9:20 Aatmesh Shrivastava, Northeastern University (aatmesh@ece.neu.edu)

*Computing at the edge: Analog Signal Processing for IoT Using High Precision Analog*

9:40 Subhanshu Gupta, Washington State University (sgupta@eecs.wsu.edu)

*Energy-efficient information-aware sampling in Edge Computing devices*

10:00 Ajit Khosla, Concordia University (khosla@gmail.com)

*Ubiquitous sensors and systems for Internet of Things*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Manos Tentzeris, Georgia Tech (etentze@ece.gatech.edu)

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

11:00 Satinder Singh, Cogknit (Satinder.singh@cogknit.com)

*Multi processor System On Chip (MPSoC) design challenges in the era of Artificial Intelligence (AI), ML (Machine Learning), Deep Learning (DL) and Blockchain (BC) applications*

11:20 Alvaro Pena-Quevedo, University of Puerto Rico (alvarojpena@gmail.com)

*Hurricanes Irma and Maria: total digital collapse at the Caribbean. Rethinking for the future communication systems*

**Session E2: Nanotechnology**

**9:00**

**Sutcliffe B**

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

9:00 Gord Harling, Innotime Technologies (gharling@innotime.ca)

*TBA*

9:20 Jaydeep Kulkarni, University of Texas (jaydeep@austin.utexas.edu)

*Materials and electronic systems based on 2D atomic layers*

9:40 Guihua Yu, University of Texas (ghyu@austin.utexas.edu)

*Functional nanostructured polymers for energy storage and environmental technologies*

10:00 Gary Leach, Simon Fraser University (gleach@sfu.ca)

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

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Swastik Kar, Northeastern University (S.Kar@neu.edu)

*Tailoring functionality at the interface between dissimilar 2D materials*

11:00 D. Keith Roper, University of Arkansas (dkroper@uark.edu)

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

11:20 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*

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

*Performance assessment of gapless graphene logic circuit designs*

**Session A3: Energy Harvesting and Storage**

**13:30**

**Mt. Currie North**

**Chairs: Chair to be Announced**

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 Ji-Hyun Jang, Ulsan National Institute of Science and Technology (clau@unist.ac.kr)

with K-H, Kim and S-Y. Yu

*Mesoporous graphene for efficient clean water supply*

14:10 Adam Duong, Université du Québec à Trois Rivières (Adam.Duong@uqtr.ca)

*Materials design for the development of energy and nanotechnology*

14:30 Karin Hinzer, University of Ottawa (khinzer@uottawa.ca)

*High efficiency photovoltaics*

14:50 Antonio Agresti, Università degli Studi di Roma "Tor Vergata" (antonio.agresti@uniroma2.it)

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

15:10 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:30 Darren Frew, BC Bioenergy Network (frew.darren@gmail.com)

*Stop wasting waste*

15:50 Cengiz Ozkan, University of California, Riverside (cozkan@engr.ucr.edu)

*Design of materials for advanced energy storage*

16:10 Abderraouf Boucherif, Canada-3IT (abderraouf.boucherif@usherbrooke.ca)

*Graphene – porous semiconductor nanocomposites for energy applications*

16:30 Mihri Ozkan, University of California, Riverside (mihri@ece.ucr.edu)

*Sulfur cathode materials for lithium-sulfur batteries*

16:50 Stefano Gregori, University of Guelph (sgregori@uoguelph.ca)

*Energy conversion and harvesting in low-power systems*



**Session B3: Wireless Technologies**

**13:30 Mt. Currie South**

**Chairs: Mohammad-Reza Nezhad-Ahmadi, University of Waterloo (mrnezhad@uwaterloo.ca)**

13:30 Andreia Cathelin, ST Microelectronics (andreia.cathelin@st.com)

*Analog RF mmw design in FD-SOI and new features enabled by body biasing techniques*

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 Tanbir Haque, InterDigital (tanbir.haque@interdigital.com)

*Developing flexible architectures for wideband data reception and rapid interference detection for cognitive radio type applications*

14:50 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:30 Rouzbeh Kananizadeh, University of California, Davis (rkanani@ucdavis.edu)

*Harmonic boosting in solid state circuits using harmonic positive feedback*

15:50 Christian Schlegel, Dalhousie University (Christian.Schlegel@Dal.ca)

with K. El-Sankary and T. Sandhu

*Ultra-low power acoustic receiver with wake-mode*

16:10 Antonio Liscidini, University of Toronto (antonio.liscidini@utoronto.ca)

*Complex poles with passive switched capacitor filters*

**Session C3: Optics and Photonics**

**13:30**

**Diamond Head**

**Chairs: Sudip Shekhar, University of British Columbia (sudip@ece.ubc.ca)**

13:30 Lukas Chrostowski, University of British Columbia (lukasc.ubc@gmail.com)  
*Sub-wavelength silicon photonics and applications*

13:50 Jonathan Bradley, McMaster University (jbradley@mcmaster.ca)  
*Rare-earth-doped light-emitting thin films and photonic devices on silicon*

14:10 Rusli, Nanyang Technological University (erusli@ntu.edu.sg)  
*Si/MoOx heterojunction hybrid solar cell*

14:30 Harry van der Graaf, National Institute for Subatomic Physics (vdgraaf@nikhef.nl)  
*New developments in the detection of single soft photons*

14:50 Douglas M. Gill, IBM (dmgill@us.ibm.com)  
*Making short reach link transmitter Figure of Merits cognizant of transmission format*

15:10 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)  
\*\*\*\*\*

15:30 Tohru Ishihara, Kyoto University (ishihara@i.kyoto-u.ac.jp)  
*Nanophotonic arithmetic and logic circuits toward optical in-network computation*

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

16:10 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*

16:30 James A. Lott, Technische Universität Berlin (lott@mailbox.tu-berlin.de)  
with G. Larisch and D. Bimberg  
*Surface emitting lasers for a green internet*

Thursday, May 10, 2018

16:50 Hengky Chandralim, Air Force Institute of Technology (Hengky.Chandralim@afit.edu)

*Sustainable whispering-gallery ring laser sensors*

**Session D3: Medical Technologies**

**13:30**

**Sutcliffe A**

**Chairs: William Barber, DxRay, Inc. (william.barber@dxray.com)**

13:30 Thomas Webster, Northeastern University (th.webster@neu.edu)

*Design, fabricating, and commercializing in-the-body nano sensors: the future of health*

13:50 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*

14:10 Syed Anas Imitiaz, Imperial College London (anas.imtiaz@imperial.ac.uk)

*An ultra-low power system wearable sleep monitoring and diagnosis*

14:30 Bonnie Gray, Simon Fraser University (bgray@sfu.ca)

*Flexible and reconfigurable microfluidic platforms for applications in biology and medicine*

14:50 Francois Rivet, Université de Bordeaux (francois.rivet@ims-bordeaux.fr)

*Intra-body communications - why not use ultrasounds instead of radio frequency*

15:10 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:30 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*

15:50 Ferruccio Pisanello, Istituto Italiano di Tecnologia (ferruccio.pisanello@iit.it)

*Micro and nanotechnologies for multipoint control of neural activity in deep brain regions*

16:10 Ross Walker, University of Utah (ross.walker@utah.edu)

*Direct neural interfaces for medical and non-medical applications*

16:30 Shiva Abbaszadeh, University of Illinois at Urbana-Champaign (sabbasza@illinois.edu)

*Improving count rate and sensitivity in cross-strip cadmium zinc telluride detectors*

16:50 Mirza Faisal Beg, Simon Fraser University (mfbeg@sfu.ca)

*Measuring structure and function from medical images*

**Session E3: Nanomaterials and Smart Materials**

**13:30**

**Sutcliffe B**

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

13:30 Peyman Servati, University of British Columbia (peymans@ece.ubc.ca)  
*Smart textile innovations for technology connected health (STITCH)*

13:50 John Madden, University of British Columbia (jmadden@ece.ubc.ca)  
*Ionic skin--towards smart, compliant and active skin for robots and wearables*

14:10 Karen Kavanagh, Simon Fraser University (kavanagh@sfu.ca)  
*Transmission He ion microscopy*

14:30 Andrzej Moscicki, Amepox Microelectronics Ltd. (amepox@amepox.com.pl)  
with A. Kinart and M. Abo Ras  
*New thermal management solution with sinterable TIM materials*

14:50 Krishna Saraswat, Stanford University (saraswat@stanford.edu)  
*Emerging interconnect technologies for nanoelectronics*

15:10 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)  
\*\*\*\*\*

15:30 Shankar Rananavare, Portland State University (ranavas@pdx.edu)  
with S.R. Darmakkolla  
*Prospects of copper nanowire self-assembly for interconnect applications*

15:50 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*

16:10 Heike Riel, IBM Zurich (hei@zurich.ibm.com)  
*From III-V integration towards ballistic nanowire quantum networks*

16:30 Jeffry Kelber, University of North Texas (kelber@unt.edu)  
with T. Cheng, W.A. Goddard III, M. Randle, J. Bird and P.A. Dowben  
*Graphene by MBE on incommensurate polar oxides: Graphene Oxide/Buckled Graphene /Graphene Heterostructures.*

**Session N1: Networking Reception**

**19:00**

**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 Mt. Currie North

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

9:00 Laleh Behjat, University of Calgary (laleh@ucalgary.ca)

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

9:20 Gene A. Frantz, Octavo Systems LLC (gene.frantz@octavosystems.com)  
with M. Murtuza

*The next frontier of integration: the system in a package*

9:40 Jayna Sheats, Terecircuits (sheats@terecircuits.com)

*Process technology for heterogeneous integration*

10:00 Salvador Pinillos Gimenez, Centro Universitário da FEI (sgimenez@fei.edu.br)

*Layout techniques for MOSFETs*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 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*

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

*Neuromorphic hardware acceleration of neural network training using analog memory*

11:20 Alex James, Nazarbayev University (apj@ieee.org)

*Large-scale simulation of memristive neural systems*

11:40 Maciej Ogorzalek, Uniwersytet Jagiellonski Krakow (maciej.ogorzalek@uj.edu.pl)  
with K. Grzesiak-Kopec

*Behavior-oriented 3D IC layout design*

12:00 Takashi Matsukawa, National Institute of Advanced Industrial Science and Technology (t-matsu@aist.go.jp)

*Process challenges for further scaling of FinFETs*

**Session C4: Radiation Detection and Imaging**

**9:00**

**Diamond Head**

**Chairs: Toby Astill, Redlen (Toby.Astill@Redlen.com)**

**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 Daniela Muenzel, Technische Universität München (muenzel@tum.de)  
*Clinical potential of spectral photon-counting computed tomography*

10:00 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*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Yi-Hwa Liu, Yale University (yi-hwa.liu@yale.edu)  
*Near-field coded aperture imaging: potential for high-sensitivity and high-resolution SPECT*

11:00 William Barber, DxRay, Inc. (william.barber@dxray.com)  
*Edge illuminated direct conversion semiconductor X-ray imaging detectors*

11:20 Vesna Sossi, University of British Columbia (vesna@phas.ubc.ca)  
*Advances in PET/MR multimodality imaging: relevance to the study of brain function*

11:40 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*

12:00 Krzysztof (Kris) Iniewski, Redlen (kris.iniewski@redlen.com)  
with C. Siu  
*Readout ASICs for CdTe/CZT sensors: architecture, performance and design characteristics*



**Session D4: Biotechnology**

**9:00**

**Sutcliffe A**

**Chairs: Chair to be Announced**

9:00 Paul Li, Simon Fraser University (paulli@sfu.ca)

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

9:20 Michael Canva, Université de Sherbrooke (Michael.Canva@USherbrooke.ca)

*Plasmonic imaging systems using nanostructured substrates for enhanced biosensing*

9:40 Edmond W.K. Young, University of Toronto (eyoung@mie.utoronto.ca)

*Transitioning biomicrofluidic systems from PDMS to plastics*

10:00 Takashi Tokuda, NAIST (tokuda@ms.naist.jp)

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

*CMOS-based implantable optogenetic neural interfacing devices*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Fabio Cicoira, École Polytechnique de Montréal (fabio.cicoira@polymtl.ca)

*Conducting polymers for flexible, stretchable and healable electronics*

11:00 Massimo De Vittorio, Università del Salento (massimo.devittorio@unisalento.it)

*Thin flexible piezoelectrics for health and energy*

11:20 Clara Santato, École Polytechnique de Montréal (clara.santato@polymtl.ca)

*Biodegradable materials and devices for electronics and energy storage*

**Session E4: Optical Materials and Devices**

**9:00**

**Sutcliffe B**

**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 Yukio Kawano, Tokyo Institute of Technology (kawano@pe.titech.ac.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 Peter Bermel, Purdue University (pbermel@purdue.edu)

*Toward an integrated system for compact solar thermophotovoltaic generation*

10:20 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

10:40 Nathaniel Kinsey, Virginia Commonwealth University (nkinsey@vcu.edu)

*Applications for emerging materials in nonlinear optics and integrated photonics*

11:00 Cun-Zheng Ning, Arizona State University (cning@asu.edu)

*Nanolasers based on integrated silicon cavity and 2D monolayer gain material*

11:20 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*

11:40 Boris Mizaikoff, Universität Ulm (boris.mizaikoff@me.com)

*Mid-infrared photonics: towards IR-lab-on-chip systems*

**Session P2: Plenary II**

**13:30**

**Mt. Currie North**

**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 Purang Abolmaesumi, University of British Columbia (purang@ece.ubc.ca)

*Advanced machine learning for ultrasound guided diagnosis and intervention*

14:30 Gregory Snider, University of Notre Dame (snider.7@nd.edu)

*Adiabatic reversible computation for ultra-low power*

15:00 COFFEE BREAK (Mt. Curie Foyer, Sutcliffe Foyer)

\*\*\*\*\*

15:30 Juan Rey, Mentor Graphics (juan\_rey@mentor.com)

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

16:00 Mark Johnson, D-Wave Systems (mwjohnson@dwavesys.com)

*Quantum annealing: a practical approach to quantum computing*

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

*Low-power issues in IoE*



*Emerging Technologies*

Communications Microsystems Optoelectronics Sensors

---

# Thank You to Our Sponsors

