

C M O S 

Emerging Technologies

2011 Meeting Program

June 15 - 17, 2011

Whistler, British Columbia, Canada

Thank You to Our Sponsors:



June 15, 2011

Session D1 Book Display & Sales (All Day)

8:00 Boardroom

Chair:

No Speaker

Session P1 Plenary

8:00 Mt. Currie South

Chair: Dan Gale, CMC Microsystems (gale@cmc.ca)

8:00 Krishna C. Saraswat, Stanford University (saraswat@stanford.edu): Germanium/Silicon based Novel Electronic and Optoelectronic Devices for Nanoelectronics

8:25 Jean Paul Allain, Purdue University (allain@purdue.edu): Directed irradiation synthesis: manipulating matter in nanoscale self-organized systems

Session 1A Biotechnology

9:00 Sutcliffe A

Chair: Li Chen, University of Saskatchewan (lic900@mail.usask.ca) and Ryan T. Kelly, PNL (ryan.kelly@pnl.gov)

9:00 Kiyotaka Sasagawa, NAIST (sasagawa@ms.naist.jp), with Takuma Kobayashi, Toshihiko Noda, Takashi Tokuda, Yumiko Hatanaka, Hideki Tamura, Sadao Shiosaka, Jun Ohta: Implantable CMOS sensor for in-vivo brain imaging of freely moving mouse

9:25 Ulrich J. Krull, University of Toronto (ulrich.krull@utoronto.ca), with Anthony J. Tavares, Omair Noor, Charles Vannoy, Lu Chen, and W. Russ Algar: FRET-based quantum dot biosensors; fabrication and operation in microfluidic channels

9:50 Vamsy Chodavarapu, McGill University (vamsy.chodavarapu@mcgill.ca): CMOS Biosensor Microsystems

10:15 Coffee Break (Foyer)

10:30 Chih-Ting (Tim) Lin, National Taiwan University (timlin@ntu.edu.tw), with Che-Wei Huang, Hsiao-Ting Hsueh, and Yu-jen Chang: The design and implementation of sensor-on-chip CMOS-based biomolecular/chemical sensor

10:55 Leyla Soleymani, Ryerson University (leyla.soleymani@ryerson.ca): Integrating advanced materials into microsystems for biosensing applications

11:20 Sandro Carrara, EPFL (sandro.carrara@epfl.ch): New frontiers in biomedical VLSI on implantable systems to monitor human metabolism including remote powering of the systems

11:45 Jae-Yoon Sim, POSTECH (jysim@postech.ac.kr): Single-chip microwave-excited plasma generator for biomedical applications

Session 1B Microsystems

9:00 Sutcliffe B

Chair: Paul D. Franzon, North Carolina State University (paulf@ncsu.edu)

- 9:00 Daniel Grogg, Ecole Polytechnique Fédérale de Lausanne and IBM Zurich Research Laboratory (daniel.grogg@gmail.com): Vibrating Body FETs
- 9:25 Michael S. McCorquodale, Integrated Device Technology, Inc. (michael.mccorquodale@idt.com): Self-Referenced Monolithic RF CMOS Oscillators for XTAL and XO Replacement
- 9:50 Paul Hagelin, SiTime (ph@sitime.com): MEMS Oscillators: From Emerging Technology to Commercial Revolution
- 10:15 Coffee Break (Foyer)
- 10:30 Kalle Levon, Polytechnic Institute of New York University (kalle.levon@gmail.com): Organic Electronics and Ion Sensitive Floating Gate FET
- 10:55 Nicolas André, Université catholique de Louvain (Nicolas.Andre@uclouvain.be): Ultra low power SOI transducer for flow and humidity sensing
- 11:20 Jinwook Oh, Korea Advanced Institute of Technology (jinwook@eeinfo.kaist.ac.kr): Intelligent Multicore Processor for Attention-based Object Recognition
- 11:45 Gloria Wong, Kovio (gloriamt@gmail.com): Printed Silicon: For RFID Applications and Beyond

Session 1C NanoMaterials

9:00 Mt. Currie South

Chair: Bobak Gholamkass, University of British Columbia (bobgk@ece.ubc.ca)

- 9:00 Simon Watkins, Simon Fraser University (simonw@sfu.ca): Control of nanowire heterostructures and doping via precursor chemistry
- 9:25 Marco Rolandi, University of Washington (rolandi@u.washington.edu): Scanning probe direct write of Si, Ge, and SiGe nanostructures
- 9:50 John Schlager, National Institute of Standards and Technology (john.schlager@nist.gov): GaN nanowires with superior optical, mechanical, and transport properties
- 10:15 Coffee Break (Foyer)
- 10:30 Ricardo Izquierdo, University of Quebec at Montreal (izquierdo.ricardo@uqam.ca): Combination of Organic Semiconductors and nanomaterials for memories and OLED fabrication
- 10:55 Chih-hung (Alex) Chang, Oregon State University (chih-hung.chang@oregonstate.edu): Microreactor-Assisted Nanomaterial Deposition™ for Scalable Nanomanufacturing
- 11:20 Ray J. E. Huetting, University of Twente (r.j.e.huetting@utwente.nl): Physics of novel thin silicon-on-insulator (SOI) electron devices
- 11:45 Loic Markley, University of Toronto (lmarkley@waves.utoronto.ca): Metamaterials for Optical and Microwave Applications

Session 1D Imaging and Sensors

9:00 Diamond Head

Chair: Orly Yadid-Pecht, University of Calgary (orly.yadid.pecht@ucalgary.ca) and Boris Stoeber, University of British Columbia (stoeber@mech.ubc.ca)

- 9:00 Gil Bub, Oxford University (gil.bub@physiol.ox.ac.uk): New approaches for high speed, high resolution imaging
- 9:25 K. Sigfrid Yngvesson, University of Massachusetts (yngvesson@ecs.umass.edu): A Frequency Domain System for Terahertz Imaging in Breast Cancer Margin Determination
- 9:50 Dileepan Joseph, University of Alberta (dil.joseph@ualberta.ca): Delta-Sigma Video Sensors for Vertically-Integrated CMOS Technology
- 10:15 Coffee Break (Foyer)
- 10:30 Hendrik Husstedt, Institute of Smart System-Technologies (hendrik.husstedt@uni-klu.ac.at): Accurate Measurement of Magnetic Fields w.r.t. the Geometry of the Field Source
- 10:55 Ellen Holthoff, US Army Research Laboratory (ellen.holthoff@us.army.mil), with Paul M. Pellegrino: Photoacoustic Spectroscopy for Chemical Sensing
- 11:20 Su-Youne Chang, Mayo Clinic (Chang.SuYoune@mayo.edu): Fast Scan Cyclic Voltammetry Recordings in Humans during Neurosurgery: Challenges and Opportunities
- 11:45 Yukio Kawano, Tokyo Institute of Technology (kawano@pe.titech.ac.jp): Scanning nanoelectrometer for mapping electric potential and its fluctuation

Session 2A Biotechnology

13:30 Sutcliffe A

Chair: Shuo Tang, University of British Columbia (tang@ece.ubc.ca) and Karen Cheung, University of British Columbia (kcheung@ece.ubc.ca)

- 13:30 Ravi Selvaganapathy, McMaster University (selvaga@mcmaster.ca): Electrical methods for transport of particles, cells, organisms and droplets in microfluidic systems
- 13:55 Steven S. Smith, City of Hope (ssmith@coh.org): Nanotechnology in Biomarker Discovery
- 14:20 Milan Stojanovic, Columbia University (mns18@columbia.edu): Construction of autonomous therapeutic and diagnostic molecular DNA devices
- 14:45 Christoph Walti, Leeds University (c.walti@leeds.ac.uk): Hybrid bio-functionalised surfaces
- 15:10 Ryan T. Kelly, PNL (ryan.kelly@pnl.gov): Droplet-Based Microfluidics: Reactions and Analyses at the Picoliter Scale
- 15:35 Coffee Break (Foyer)
- 15:50 Shalom J. Wind, Columbia University (sw2128@columbia.edu): Biomolecular-Scale Engineering
- 16:15 Ranjit Pati, MTU (patir@mtu.edu): Molecular Switch exhibiting Negative Differential Resistance behavior: Understanding the underlying physics
- 16:40 Lior Blockstein, University of Calgary (blockstein@gmail.com), with Orly Yadid-Pecht: A Bio-compatible Polymer for Contact Imaging of Live Neurons

Session 2B NanoElectronics

13:30 Sutcliffe B

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

- 13:30 Thierry Baron, CEA (thierry.baron@cea.fr): Growth and self-assembling of nanostructures for nanoelectronic devices
- 13:55 Russell Cowburn, University of Cambridge (rpc12@cam.ac.uk): 3-Dimensional Spintronics
- 14:20 Berend Jonker, Naval Research Laboratory (Jonker@nrl.navy.mil), with C.H. Li and O.M.J. van 't Erve: Silicon Spintronics: spin injection, accumulation and detection to 500K
- 14:45 Igor Zutic, University of Buffalo (zigor@buffalo.edu): Semiconductor Spin-Lasers.
- 15:10 Hanan Dery, University of Rochester (hdery@ece.rochester.edu): Low Power Spin-Based Reconfigurable Logic
- 15:35 Coffee Break (Foyer)
- 15:50 Dmytro F. Perepichka, McGill University (dmitrii.perepichka@mcgill.ca): Self-Assembled Molecular Networks for Organic and Nano Electronics
- 16:15 Tobias Erlbacher, Fraunhofer Institute for Integrated Systems and Device Technology (tobias.erlbacher@iisb.fraunhofer.de): Integration of trench gate technology into planar LDMOS topology
- 16:40 Yasuo Yoshida, University of Hamburg and University of Tokyo (yyoshida@physnet.uni-hamburg.de): Detection and manipulation of atomic spins on a two-dimensional magnetic template
- 17:05 Takehiro Tokuno, Osaka University (takehiro_tokuno@eco.sanken.osaka-u.ac.jp), with Masaya Nogi, Jinting Jiu and Katsuaki Suganuma: Synthesis and application of silver nanowires

Session 2C Memories

13:30 Mt. Currie South

Chair: **Mark Greenstreet, University of British Columbia (mrg@cs.ubc.ca) and Scott Nelson, Intel (scott.nelson@intel.com)**

- 13:30 Bob Merritt, Convergent Semiconductors (bobm@convergentsemiconductors.com): Semiconductor Industry in Transition: Looking Beyond the Datasheet
- 13:55 Geoffrey W. Burr, IBM (burr@almaden.ibm.com): Storage Class Memory
- 14:20 Santosh Kurinec, Rochester Institute of Technology (skkcmc@rit.edu): Nanoscale Materials Engineering for Phase Change Memory
- 14:45 Tobias Nowozin, Technical University Berlin (nowozin@sol.physik.tu-berlin.de): Nanoflash memory based on quantum dots
- 15:10 Jeong-Heon Park, Samsung (jaman123@gmail.com; huni.park@samsung.com): Latest advances in scalable STT-MRAM for future standalone memory
- 15:35 Coffee Break (Foyer)
- 15:50 Ken (Kangho) Lee, Qualcomm (kanghol@qualcomm.com): Advances and Prospects of Embedded STT-MRAM
- 16:15 Stuart Parkin, IBM (parkin@almaden.ibm.com), with Geoffrey Burr: Racetrack Memory: a novel spintronics solid state memory-storage device

Session 2D Sensors**13:30 Diamond Head****Chair: Yukio Kawano, Tokyo Institute of Technology (kawano@pe.titech.ac.jp) and Volker Nock, University of Canterbury (volker.nock@canterbury.ac.nz)**

- 13:30 Tae Wook Kim, Yonsei University (taewook.kim@yonsei.ac.kr): Accurate wireless ranging using CMOS
- 13:55 Dwight L. Woolard, Army Research Office (dwight.woolard@us.army.mil), with Greg Recine, Fordham University (grecine@fordham.edu): Organic & Biological Molecular Devices for Application to THz/IR Sensing Architectures
- 14:45 D. Keith Roper, University of Arkansas (dkroper@uark.edu): Plasmon coupling enhanced in lithographed nanostructures for alternative energy, chem/bio sensing, and theranostics
- 15:35 Coffee Break (Foyer)
- 15:50 Joseph Bardin, University of Massachusetts Amherst (jbardin@ecs.umass.edu): Cryogenic Applications for Commercial Silicon-Germanium Technology
- 16:15 John F. Conley, Jr., Oregon State University (jconley@eecs.oregonstate.edu): Directed Growth and Electrical Integration of ZnO Nanobridge Sensors using Lithographically Patterned Carbonized Photoresist

Session 2E Wireless**13:30 Black Tusk****Chair: Hua Wang, Intel (hua.wang@intel.com) and Stephen Bates, Raithlin Semiconductors (sbates@raithlin.com)**

- 13:30 Minoru Fujishima, Hiroshima University (fuji@hiroshima-u.ac.jp): Millimeter-Wave and Terahertz CMOS Design
- 13:55 P. (Pooyan) Sakian Dezfuli, Eindhoven University of Technology (p.sakian.dezfuli@tue.nl): Receiver Frontends with Robustness to Process Variation
- 14:20 Sumy Jose, University of Twente (S.Jose@ewi.utwente.nl): Bulk Acoustic Wave (BAW) resonators for future mobile communication systems
- 14:45 Farid Medjdoub, University of Lille (farid.medjdoub@iemn.univ-lille1.fr), with M. Zegaoui, R. Crunelle, N. Rolland and P.A. Rolland: Innovative ultrathin barrier GaN-based heterostructure. Towards higher performance transmitters and receivers up to W band
- 15:10 Kaushik Sengupta, Caltech (kaushiks@caltech.edu): Distributed Active Radiation for THz signal generation and Beam Forming in CMOS
- 15:35 Coffee Break (Foyer)
- 15:50 Michael Youssef, Broadcom (myoussef@broadcom.com): Polar Transmitters for Cellular Application
- 16:15 Kenneth Young, Telcordia Technologies, Inc. (kcy@research.telcordia.com): Challenges in Military Wireless Communications
- 16:40 Alyssa Apsel, Cornell University (aba25@cornell.edu): Biologically Inspired Low Power Radio Networks
- 17:05 Christine Raynaud, CEA-LETI, ST Microelectronics (christine.raynaud@cea.fr): SOI CMOS Technology for Wireless Applications: Current trends and Perspectives

Session S1 UBC and CMC Microsystems: Dinner Reception & Cash Bar**18:30 Mt. Currie North****Chair: Ian McWalter, CMC Microsystems (mcwalter@cmc.ca) and Andre Ivanov, University of British Columbia (ivanov@ece.ubc.ca)**

No Speaker

June 16, 2011

Session D2 Book Display & Sales (All Day)

8:00 Boardroom

Chair:

No Speaker

Session P2 Plenary II

8:00 Mt. Currie South

Chair: Dan Gale, CMC Microsystems (gale@cmc.ca)

- 8:00 Vladimir Stojanovic, Massachusetts Institute of Technology (vladimir.stoj@gmail.com): Designing VLSI Circuits and Systems with Nano-Electro Mechanical Relays
- 8:25 Kwabena Boahen, Stanford University (boahen@stanford.edu): High-performance computing for large-scale brain simulations using neuromorphic chips

Session 3A Photonics

9:25 Sutcliffe A

Chair: Lukas Chrostowski, University of British Columbia (lukasc@ece.ubc.ca)

- 9:25 Zetian Mi, McGill University (zetian.mi@mcgill.ca): Nanotube and nanowire based coherent light sources on Silicon
- 9:50 Gary Shambat, Stanford University (gshambat@gmail.com): Ultra-low power electrically driven photonic crystal nanocavity lasers and modulators
- 10:15 Coffee Break (Foyer)
- 10:30 Rashid Zia, Brown University (Rashid_Zia@brown.edu): Leveraging Electric and Magnetic Dipole Transitions for Active Nanophotonic Devices
- 10:55 Haim Grebel, The Electronic Imaging Center NJIT (grebel@ADM.NJIT.EDU): Free-standing graphene-coated periodic structures at the nano and micron scales
- 11:20 Peter Bermel, Massachusetts Institute of Technology (bermel@mit.edu): Using photonics to design and build highly-efficient thermophotovoltaic energy conversion systems
- 11:45 Tiziana C. Bond, Lawrence Livermore National Laboratory (bond007@llnl.gov): Nanostructures for surface enhanced optical sensing and spectroscopy

Session 3B NanoElectronics

9:25 Sutcliffe B

Chair: Giuseppe Scarpa, Munich Technical University (scarpa@tum.de)

- 9:25 Paul D. Franzon, North Carolina State University (paulf@ncsu.edu), with Daniel Schinke and Neil Di Spigna: Computing with Novel Floating Gate Devices
- 9:50 Jerry M. Chow, IBM T.J. Watson Research Center (chowmj@us.ibm.com): Multi-Qubit Quantum Computing
- 10:15 Coffee Break (Foyer)
- 10:30 Peter Grutter, McGill University (grutter@physics.mcgill.ca): Quantum Dots
- 10:55 Sayeef Salahuddin, Berkeley (sayeef@eecs.berkeley.edu): Novel concepts for steep subthreshold switches
- 11:20 Chaoqi Zhang, Georgia Tech (chqzhang@gatech.edu): Interconnect Technologies for 3D Heterogeneous System Integration
- 11:45 Dan Dalacu, National Research Council of Canada (dan.dalacu@nrc-cnrc.gc.ca), with K. Mnamyneh, S. Frederick, J. Lapointe, P.J. Poole, G.C. Aers, R. Cheriton, and R.L Williams: Scalable approach for the generation of non-classical light based on quantum dot – microcavity systems

Session 3C VLSI**9:25 Mt. Currie South****Chair: Sam Palermo, Texas A&M University (spalermo@mail.ece.tamu.edu)**

- 9:25 Yvon Savaria, École Polytechnique de Montréal (yvon.savaria@polymtl.ca): A Wafer-Scale Rapid Electronic Systems Prototyping Platform
- 9:50 Mark Greenstreet, University of British Columbia (mrg@cs.ubc.ca), with Ian Jones and Suwen Yang: Synchronizer design in deep-submicron technologies
- 10:15 Coffee Break (Foyer)
- 10:30 Wai Tung Ng, University of Toronto (ngwt@vrg.utoronto.ca): Power FINFET, a novel superjunction lower power MOSFET
- 10:55 Mircea R. Stan, University of Virginia (mrs8n@cms.mail.virginia.edu): Reliability and wearout-aware design
- 11:20 Frank O'Mahony, Intel (Frank.O'Mahony@intel.com): Designing sub-1pJ/bit Serial Links
- 11:45 Daniele Ludovici, University of Ferrara, Italy (daniele.ludovici@unife.it): Overcoming the Clocking Concern in MPSoCs: From the GALS Concept to a Mature GALS Technology

Session 3D Microsystems Technologies**9:25 Diamond Head****Chair: Vamsy Chodavarapu, McGill University (vamsy.chodavarapu@mcgill.ca)**

- 9:25 Ruud Vullers, imec/Holst Centre (Ruud.Vullers@imec-nl.nl): Opportunities and Challenges of MEMS based Energy Harvesters
- 9:50 Alper Bozkurt, North Carolina State University (aybozkur@ncsu.edu): Interfacing Microtechnologies with Metamorphic Development
- 10:15 Coffee Break (Foyer)
- 10:30 Kenichi Takahata, University of British Columbia (takahata@ece.ubc.ca): RF-Controlled Wireless MEMS Actuators and Devices for Biomedical Applications
- 10:55 Edmond Cretu, University of British Columbia (edmondc@ece.ubc.ca): MEMS and their control through programmable electronics
- 11:20 Richard Oleschuk, Queen's University (oleschuk@chem.queensu.ca): The Use of Microstructured Optical Fibres As and In Microfluidic systems

Session S2 IEEE/CPMT Distinguished Lecture & Buffet Lunch**12:15 Mt. Currie****Chair: Paul Wesling, IEEE (p.wesling@ieee.org)**

- 12:45 Paul Wesling, IEEE (p.wesling@ieee.org): Academic and Industrial Research: Using the IEEE's XPLORE Database

Session 4A Photonics

13:30 Sutcliffe A

Chair: **Nicolas Jaeger, University of British Columbia (nickj@ece.ubc.ca)**

- 13:30 Miguel Levy, Michigan Technological University (mlevy@mtu.edu), with N. Dissanayake, P. Kumar, A. Chakravarty and V. J. Fratello: Nonreciprocal and polarization effects in magneto-photonic crystals
- 13:55 Kazumi Wada, Tokyo University (kwada@material.t.u-tokyo.ac.jp): Challenge of Si Photonics for WDM Implementation on electronic- and photonic-LSIs
- 14:20 Rama Raj, Laboratoire de Photonique et de Nanostructures, CNRS (rama.raj@lpn.cnrs.fr): A new platform for integrated optics: hybrid III-V nano photonic crystal devices on SOI waveguides
- 14:45 Firooz Aflatouni, University of Southern California (aflatoun@usc.edu): RF Assisted Absolute Phase Control of Semiconductor Lasers
- 15:10 Michael Dayringer, Oracle (michael.dayringer@oracle.com): Circuit techniques to enable 10 Gbps, 530 fJ/b optical transceiver circuits in 40 nm CMOS
- 15:35 Coffee Break (Foyer)
- 15:50 Hyundai Park, Intel (hyundai.park@intel.com): Silicon photonics for optical interconnects
- 16:15 Lih Y. Lin, University of Washington (lylin@uw.edu): Quantum Dot Nanophotonics for Detection and Stimulation
- 16:40 Igor A. Levitsky, Emitech, Inc. (ilevit1997@aol.com): Optical gas chemosensors based on nanostructured organic-inorganic composites

Session 4B NanoTechnology

13:30 Sutcliffe B

Chair: **Alireza Nojeh, University of British Columbia (anojeh@ece.ubc.ca) and Steven S. Smith, City of Hope (ssmith@coh.org)**

- 13:30 Rao Tummala, Georgia Institute of Technology (rao.tummala@ece.gatech.edu): System-On-Package: Moore's Law for System Integration
- 13:55 Armin Knoll, IBM Research Zurich (ark@zurich.ibm.com), with Philip Paul, Felix Holzner, Michel Despont, and Urs Duerig: Direct Write Nanopatterning Using Probes
- 14:20 Giuseppe Scarpa, Munich Technical University (scarpa@tum.de): Organic sensing devices for biological assays
- 14:45 Alexey Y. Kovalgin, University of Twente (A.Y.Kovalgin@utwente.nl): Nanoscopic Conductive Link: a Sensor, Actuator, or Light Emitter?
- 15:10 Chung-Hoon Lee, Marquette University (chunghoon.lee@marquette.edu): Fabrication and applications of suspended Nanogap
- 15:35 Coffee Break (Foyer)
- 15:50 Curt Richter, National Institute of Standards and Technology (curt.richter@nist.gov): Metrology to enable nanoelectronic memories
- 16:15 Liberato Manna, Italian Institute of Technology (Liberato.Manna@iit.it): Advanced synthesis and assembly of colloidal nanostructures for energy related applications
- 16:40 Jeffrey Sleight, IBM T.J. Watson Research Center (sleight@us.ibm.com): Silicon Nanowire Devices and Circuits
- 17:05 Yu HongYu, Nanyang Technological University (HYYU@ntu.edu.sg): Vertical Si Nanowire based junction-less SONOS memory

Session 4C Emerging Medicine and Medical Devices**13:30 Mt. Currie South****Chair: Purang Abolmaesumi, University of British Columbia (purang@ece.ubc.ca)**

- 13:30 John Yeow, University of Waterloo (jyeow@engmail.uwaterloo.ca): Micro and Nanotechnology Empowered Biomedical Instruments
- 14:20 Jerald Yoo, Massachusetts Institute of Technology (jerald@MIT.EDU): Wearable Healthcare
- 14:45 Thomas K. Lewellen, University of Washington (tkldog@u.washington.edu): The Evolution of Detectors for Nuclear Medicine imaging
- 15:10 Ian Lazarus, STFC Daresbury Laboratory (ian.lazarus@stfc.ac.uk): PROSPECTUS- A novel SPECT imager
- 15:35 Coffee Break (Foyer)

Session 4D Circuits**13:30 Diamond Head****Chair: Frank O'Mahony, Intel (Frank.O'Mahony@intel.com)**

- 13:30 Marc Riedel, University of Minnesota (mriedel@umn.edu): Synthesizing Logical Computation on Stochastic Bit Streams
- 13:55 Ehsan Afshari, Cornell University (ehsan@ece.cornell.edu): High Power Terahertz and Sub-millimeter-Wave Signal Generation and Amplification on CMOS
- 14:20 Vincent Gaudet, University of Waterloo (vcgaudet@ecemail.uwaterloo.ca), with Russell Dodd (University of Alberta) and Christian Schlegel (University of Alberta): FPGA Architecture for Iterative Cancellation over Interference Channels
- 14:45 Ramesh Harjani, University of Minnesota (harjani@umn.edu): Back to the Future: Going Analog
- 15:10 Chun-Ming Hsu, IBM (chunmhsu@gmail.com): Mostly-Digital Approach to Clock Generation and Recovery in High-Speed Serial Link
- 15:35 Coffee Break (Foyer)
- 15:50 Brian Cronquist, Monolithic 3D Inc. (Brian@monolithic3d.com), with Deepak Sekar, Israel Beinglass, Paul Lim and Zvi Or-Bach: Monolithic 3D Integrated Circuits
- 16:15 Pablo Ituero, Polytechnic University of Madrid (pituero@die.upm.es; m.lopez.vallejo@gmail.com): PVT Variations Monitoring in Nanometer CMOS ICs

Session S3 Networking Reception: Canada's National Design Network and a \$50M Embedded Systems Journey**18:00 Cheakamus****Chair: Ian McWalter, CMC Microsystems (mcwalter@cmc.ca)**

- Edmond Cretu, University of British Columbia (edmondc@ece.ubc.ca)
- Richard Oleschuk, Queen's University (oleschuk@chem.queensu.ca)
- El Mostapha Aboulhamid, University of Montreal (em.aboulhamid@umontreal.ca)
- Bozena Kaminska, Simon Fraser University (kaminska@sfu.ca)
- Greg Bridges, University of Manitoba (bridges@EE.UManitoba.CA)
- Paul Chow, University of Toronto (pc@eecg.toronto.edu)
- Yvon Savaria, École Polytechnique de Montréal (yvon.savaria@polymtl.ca)

June 17, 2011

Session D3 CMC Microsystems and emSYSCAN (All Day)

8:00 Boardroom

Chair: Ian McWalter, CMC Microsystems (mcwalter@cmc.ca)

No Speaker

Session P3 Plenary III

8:00 Mt. Currie South

Chair: Stephen Bates, Raithlin Semiconductors (sbates@raithlin.com)

8:00 Ruby B. Lee, Princeton University (rblee@Princeton.EDU): Designing Memory Caches for Security with Improved Performance

8:25 Kiyoo Itoh, Hitachi (kiyoo.itoh.pt@hitachi.com): Device conscious circuit designs for the 0.5-V CMOS era

**Session 5A Innovative Semiconducting Devices for Logic and Energy
Conversion: Future Trends and Emerging Technologies**

9:00 Sutcliffe A

Chair: Giuseppe Tettamanzi, University of New South Wales (g.tettamanzi@unsw.edu.au)

9:00 Heike Riel, IBM Research - Zurich (hei@zurich.ibm.com), with Mikael Björk, Heinz Schmid, Kirsten Moselund, Cedric Bessire, Hesham Ghoneim, Siegfried Karg, and Emanuel Lörtscher: Nanowire Tunnel FETs - From All-Silicon Towards Heterostructures

9:25 Kenneth Goodson, Stanford University (goodson@stanford.edu): Thermal Management Challenges and Advanced Cooling Technologies for CMOS

9:50 Clara Santato, Ecole Polytechnique do Montreal (clara.santato@polymtl.ca), with Julia Wuensche: Growth and Morphology of Eumelanin Thin Films – A Future Bioelectronic Material?

10:15 Coffee Break (Foyer)

10:30 Gerhard Klimeck, Purdue University (gekco@purdue.edu): Quantitative multi-million atom simulations for quantum dots and single impurities in Si

10:55 Gareth Keane, National Semiconductor (Gareth.Keane@nsc.com): From Technology to Revenue - Funding Innovation in the Semiconductor Industry

11:20 Sven Rogge, Delft University of Technology (S.Rogge@tudelft.nl): Single dopant transport spectroscopy in silicon

11:45 Hendrik Heinz, University of Akron (hh29@uakron.edu): Understanding and tuning the binding strength of surfactants and biomolecules to Au and Pd surfaces in solution: Molecular epitaxy, covalent bonding, and induced charges

Session 5B Embedded Systems

9:00 Sutcliffe B

Chair: Stephen Bates, Raithlin Semiconductors (sbates@raithlin.com)

- 9:00 Fumio Arakawa, Renesas (fumio.arakawa.ym@renesas.com): Low Power Multicore for Embedded Systems
- 9:25 Kaushik Ravindran, National Instruments (kaushik.ravindran@ni.com), with Hugo Andrade, Arkadeb Ghosal: LabVIEW: A Graphical System Design Platform to Test, Prototype, and Deploy Embedded Systems
- 9:50 Chuck Moore, AMD (Chuck.Moore@amd.com): System Architecture in the Heterogeneous Computing Era
- 10:15 Coffee Break (Foyer)
- 10:30 Paolo Meloni, University of Cagliari (paolo.meloni@diee.unica.it): Exploiting FPGAs for Design Space Exploration of multi-core heterogeneous architectures: the MADNESS project experience
- 10:55 Ryan Kastner, University of California, San Diego (kastner@cs.ucsd.edu): A Low Cost Acoustic Modem for Underwater Sensor Networks
- 11:20 Robert Wille, University of Bremen (rwille@informatik.uni-bremen.de): Towards a Design Flow for Reversible Logic
- 11:45 Ann Gordon-Ross, University of Florida (ann@ece.ufl.edu): Profiling and Optimization Methodologies for Sensor Networks

Session 5C Microsystems Technologies

9:00 Mt. Currie South

Chair: Dan Deptuck, CMC Microsystems (deptuck@cm.ca) and Laurent Francis, Université catholique de Louvain (laurent.francis@uclouvain.be)

- 9:00 Husam Alshareef, King Abdullah University of Science and Technology (husam.alshareef@kaust.edu.sa): FunctionalOxide Capping Layers for CMOS Devices
- 9:25 Tse Nga (Tina) Ng, Palo Alto Research Center (tnng@parc.com): Inkjet-printing of ferroelectric memory arrays and titanium oxide memristive junctions
- 9:50 Robert Patti, Tezzaron (rpatti@tezzaron.com): 3-D Integration
- 10:15 Coffee Break (Foyer)
- 10:30 Chris Bower, Semprius Inc. (Chris.Bower@semprius.com): Applications for Transfer-Printed Microscale Integrated Circuit Devices
- 10:55 Tsuyoshi Sekitani, University of Tokyo (sekitani@ap.t.u-tokyo.ac.jp), with Takao Someya: Stretchable and foldable circuits for large-area sensors and actuators
- 11:20 Jeremy Robinson, US Naval Research Laboratory (jeremy.robinson@nrl.navy.mil): Graphene-based Materials for Nanomechanical Applications
- 11:45 Akitsu Shigetou, National Institute for Materials (SHIGETOU.Akitsu@nims.go.jp): Vapor-Assisted Surface Activation Bonding for Low-Temperature Hetero Integration in Ambient Air

Session 5D Circuits

9:00 Diamond Head

Chair: **Shahriar Mirabbasi, University of British Columbia (shahriar@ece.ubc.ca)**

- 9:00 Josep Altet, Universitat Politècnica de Catalunya (josep.altet@upc.edu), with Jose Silva-Martinez, Marvin Onabajo, Eduardo Aldrete, and Diego Mateo: Differential Temperature Sensors as On-Chip RF Power Detectors in Standard CMOS Technology
- 9:25 Trent McConaghy, Solido Design Automation (trent_mcconaghy@yahoo.com): Modern Statistical Methods for Variation-Aware Modeling, Analysis, and Design
- 9:50 Hai Lan, Rambus (hlan@rambus.com): Supply Noise Induced Jitter in High-Speed I/O Interfaces
- 10:15 Coffee Break (Foyer)
- 10:30 Tetsuya Asai, Hokkaido University (asai@ist.hokudai.ac.jp): Memristor-CMOS Hybrid Analog Circuits for Neuromorphic Computing
- 10:55 Koji Kotani, Tohoku University (kotani@ecei.tohoku.ac.jp): Above-CMOS processing technique for flexible tuning of on-chip inductor characteristics
- 11:20 Johan Bauwelinck, Ghent University – IMEC (johan.bauwelinck@intec.UGent.be): Burst-mode transmitters and receivers for next generation 10Gb/s optical access networks
- 11:45 R. Fabian Pease, Stanford University (pease@cis.stanford.edu): 3-D integrated Circuitry

Session 5E Radiation

10:30 Black Tusk

Chair: **Fabrice Retiere, Triumph (fretiere@triumf.ca)**

- 10:30 Kai Vetter, Berkeley (kvetter@berkeley.edu): Radiation Imaging using Semiconductor Sensors
- 10:55 Ian Johnson, Paul Scherrer Institute (ian.johnson@psi.ch): Eiger a fast framing, large area pixel detector for X-ray applications
- 11:20 Lorenzo Fabris, Oak Ridge National Lab (fabrisl@ornl.gov): Square meter-class radiation detectors and their applications
- 11:45 Li Chen, University of Saskatchewan (lic900@mail.usask.ca): Using Pulse Laser beam in Studying Single Event Effects
- 12:10 Juha Kalliopuska, VTT Microsystems and Nanoelectronics (juha.kalliopuska@vtt.fi): Road to advanced and cost efficient large area imaging using the hybrid detector technology

**Session 6A Innovative Semiconducting Devices for Logic and Energy
Conversion: Future Trends and Emerging Technologies**

13:30 Sutcliffe A

Chair: Giuseppe Tettamanzi, University of New South Wales (g.tettamanzi@unsw.edu.au)

- 13:30 Federico Rosei, University of Quebec (rosei@emt.inrs.ca): Exploring molecular assembly at surfaces: from supramolecular systems to robust surface confined polymers
- 13:55 Yukinori Ono, NTT (ono@aecl.ntt.co.jp), with M. A. H. Khalafalla, J. Noborisaka, G. P. Lansbergen, and A. Fujiwara: Dopants in Silicon Transistors: Transport and Photoemission
- 14:20 Alberto Morpurgo, University of Geneva (Alberto.Morpurgo@unige.ch): Normal and superconducting transport through a gated 3D topological insulator
- 14:45 Silvano De Franceschi, CEA-LETI (silvano.defranceschi@cea.fr): Spins in SiGe self-assembled nanostructures
- 15:10 David N. Jamieson, University of Melbourne (d.jamieson@unimelb.edu.au): Inserting single atoms into silicon devices - deterministic ion implantation for atomic functionalities
- 15:35 Coffee Break (Foyer)
- 15:50 Mark A. Eriksson, University of Wisconsin-Madison (maeriksson@wisc.edu): Electron Spin Qubits in Si/SiGe Quantum Dots
- 16:15 Konstantin Likharev, Stony Brook University (klikharev@notes.cc.sunysb.edu): Hybrid CMOS/Nanoelectronics: Devices, Circuits and Possible Applications

Session 6B Semiconductor Technologies

13:30 Sutcliffe B

Chair: Konrad Walus, University of British Columbia (konradw@ece.ubc.ca)

- 13:30 Maxime Darnon, CEA-LETI (maxime.darnon@cea.fr): Challenges of porous SiOCH dielectric material integration for advanced interconnect technology nodes
- 13:55 Rehan Kapadia, Berkeley (r.kapadia@berkeley.edu), with Ali Javey: Ultrathin compound semiconductor on insulator (XOI) for high performance nanoscale transistors
- 14:20 Nathan Niehart, Iowa State University (niehart@iastate.edu): Facile, scalable and ambient electrochemical route for titania memristor fabrication
- 14:45 Christoph Boehme, Utah University (boehme@physics.utah.edu): Electronic nuclear and electron spin readout devices for silicon based spin electronics
- 15:10 Vladimir Litvinov, Sierra Nevada Corporation (vlitvinov@earthlink.net): Resonance tunneling and negative differential resistance in III-Nitrides
- 15:35 Coffee Break (Foyer)
- 15:50 Jiro Ida, Kanazawa Institute of Technology (ida@neptune.kanazawa-it.ac.jp): Review of SOI device status and Fully Depleted (FD) SOI for ultra low power and harsh application
- 16:15 Todd Hylton, Defence Advanced Research Projects Agency (Todd.Hylton@darpa.mil): Electronics for Intelligent Systems
- 16:40 Steven Koester, University of Minnesota (skoester@umn.edu): Performance limitations for Si and III-V TFETs

Session 6C VLSI**13:30 Mt. Currie South****Chair: Stephen Bates, Raithlin Semiconductors (sbates@raithlin.com)**

- 13:30 Samir Chaudhry, TowerJazz (samir.chaudhry@jazzsemi.com), with Marco Racanelli: A Specialty Foundry Technology Platform for Analog Intensive Mixed Signal ICs
- 13:55 Lanny L. Lewyn, Lewyn Consulting Inc. (lanny@pacbell.net), with Nicolas Williams: A New Paradigm for Nanoscale Analog CMOS Design
- 14:20 David Hopkins, Oracle (David.Hopkins@oracle.com): Enabling technologies for 3-D integration and the architectures they enable
- 14:45 Pauline C. Haddow, Norwegian University of Science and Technology (Pauline@idi.ntnu.no): Challenges of Evolvable Hardware: Past, Present and the Path to a Promising Future
- 15:10 Stephen Bates, Raithlin Semiconductors (sbates@raithlin.com): Validating Communication & Storage IP in the Multi-Gbit/s world
- 15:35 Coffee Break (Foyer)

Session 6D Smart Grids and Green Energy**13:30 Diamond Head****Chair: Juri Jatskevich, University of British Columbia (jurij@ece.ubc.ca) and Claudio Rey, Fujitsu (claudiogustavore@netscape.net)**

- 13:30 Alberto Leon-Garcia, University of Toronto (alberto.leongarcia@utoronto.ca): Comparison of Network Design Algorithms in Smart Grids and Core Communications Networks
- 13:55 Fangxing (Fran) Li, University of Tennessee (fli6@utk.edu): Vision of Future Control Centers in Smart Grids
- 14:20 Bobak Gholamkass, University of British Columbia (bobgk@ece.ubc.ca): Flexible and low cost solar cells
- 14:45 Qiquan Qiao, South Dakota State University (Qiquan.Qiao@sdstate.edu): Organic Photovoltaics for Renewable Energy
- 15:10 Guobin Jia, Institute of Photonic Technology (guobin.jia@ipht-jena.de), with Fritz Falk, Martin Steglich, Björn Einsenhawer and Ingo Sill: Silicon nanowire solar cells
- 15:35 Coffee Break (Foyer)
- 15:50 Victor Moroz, Synopsys (Victor.Moroz@synopsys.com): Mono-Crystalline Silicon Solar Cell Optimization and Modeling
- 16:15 Xugang Zhang, Johnson Controls (zhangxg@gmail.com): Investigation of Mechanical Properties for electrochemical cells in PHEV/EV Applications
- 16:40 Majeed Foad, Applied Materials (Majeed_Foad@amat.com): Innovating for a Greener Tomorrow

Session 6E Semiconductor Devices

13:30 Black Tusk

Chair: Simon Watkins, Simon Fraser University (simonw@sfu.ca)

- 13:30 Tetsuo Endoh, Tohoku University (endoh@riec.tohoku.ac.jp): Impact of Spintronics Devices with Vertical MOSFET Technology for Future Nano-VLSI
- 13:55 Robert M. Wallace, University of Texas at Dallas (rmwallace@utdallas.edu): In-situ studies of High-k/High-Mobility Interfaces
- 14:20 Jin He, Peking University (hejin@szpku.edu.cn), with , Chenyue Ma, Wenping Wang, Guiyu Wei, Wen Wu, Wei Zhao, Ruonan Wang, Yong Ma, Xiaojin Zhao, Xiufang Zhang, and Yun Ye: FinFET Reliability Study: from Experiment to Modeling
- 14:45 Alireza Nojeh, University of British Columbia (anojeh@ece.ubc.ca): Carbon nanotube electron sources: electron- and photon-induced emission
- 15:10 Emanuel Tutuc, University of Texas at Austin (etutuc@mer.utexas.edu): Graphene bilayers: electron transport and potential device applications
- 15:35 Coffee Break (Foyer)
- 15:50 Phillip N. First, Georgia Institute of Technology (first@physics.gatech.edu): Mapping the Local Electronic Structure of Epitaxial Graphene
- 16:40 Qingqing Liang, Chinese Academy of Sciences (liangqingqing@ime.ac.cn): Process analysis and device optimization of SRAM yield in advanced VLSI technology
- 16:40 Lisheng Wang, SUNY at Stony brook (liswang@ic.sunysb.edu), with P. Gouma, X. Yun, and M. Stanacevic: Acetone Nanosensor Breathalyzer for Diabetes Detection