



2012 Conference Program

July 18-20, 2012

Vancouver, British Columbia, Canada

Thank You to Our Sponsors:

Track P Plenary Talks

July 18, 2012

Session P1 Plenary I

8:00

Chair1: Dan Gale, CMC Microsystems (dan.gale@cmc.ca)

Chair2:

Jan Rabaey, University of California (jan@eecs.berkeley.edu)

The Swarm at the Edge of the Cloud - the New Face of Wireless

Walden C. Rhines, Mentor Graphics (wally_rhines@mentor.com)

Semiconductor Industry Consolidation

David Hansquine, Qualcomm (dhansqui@qualcomm.com)

Computing Trends and the Mobile Experience

Nitish Thakor, Johns Hopkins University (nthakor@bme.jhu.edu)

From Chip to Applications or How to Enable Scientific Discovery or Practical Solutions

Pierre Khuri-Yakub, Stanford University (khuri-yakub@stanford.edu)

Capacitive Micromachined Ultrasonic Transducers as a Platform Technology

July 19, 2012

Session P2 Plenary II

8:00

Chair1: Andre Ivanov, University of British Columbia (ivanov@ece.ubc.ca)

Chair2:

Geoffrey Ling, Defense Advanced Research Projects Agency (Geoffrey.Ling@darpa.mil)

Revolutionizing Prosthetics

Yusuf Leblebici, École Polytechnique Fédérale de Lausanne (yusuf.leblebici@epfl.ch)

Nanowire-Based Ambipolar Devices and Logic Arrays

Joshua Smith, University of Washington (jrs@cs.washington.edu)

Wirelessly Powered Sensing Platforms

Radu Marculescu, Carnegie Mellon University (radum@ece.cmu.edu)

Design of Thousand Core Systems

Markus J. Buehler, Massachusetts Institute of Technology (mbuehler@mit.edu)

Tu(r)ning Weakness to Strength

July 20, 2012

Session P3 Plenary III

8:00

Chair1: Sandro Carrera, École Polytechnique Fédérale de Lausanne (sandro.carrara@epfl.ch)

Chair2:

Jean Paul Allain, Purdue University (allain@purdue.edu) with R. Kempaiah, E. Walker and L. Reece
Nanopatterning of Bio-Interfaces

Thomas Webster, Brown University (thomas_webster@brown.edu)
Wireless Nanotechnology Derived In Situ Sensors for Ensuring Medical Device Success

Brent Sauder, University of British Columbia (bsauder@exchange.ubc.ca)
Driving Innovation - The UBC Story

Derek Abbott, University of Adelaide (dabbott@eleceng.adelaide.edu.au)
How Do We Solve the World's Energy Supply Problem? Finding Scalable Solutions

Track A VLSI Circuits, Devices and Technologies

July 18, 2012

Session A1 Memories

10:30

Chair1: Sorin Voinigescu, University of Toronto (sorinv@eecg.toronto.edu)

Chair2:

Tobias Nowozin, Technische Universität Berlin (nowozin@sol.physik.tu-berlin.de) with Dieter Bimberg and Andreas Marent
The QD-Flash: Merging DRAM and Flash

Hao Yu, Nanyang Technological University (haoyu@ntu.edu.sg)
Internal State Variables and New Modified Nodal Analysis for Non-Volatile Memory Devices

Takahiro Hanyu, Tohoku University (hanyu@riec.tohoku.ac.jp)
Prospects of Nonvolatile Logic-in-Memory Architecture Using Magnetic Tunnel Junction Devices

Yu (Kevin) Cao, Arizona State University (Yu.Cao@asu.edu)
Design Exploration of Heterogeneous Memory Technologies

Stuart S.P. Parkin, IBM Almaden Research Center (parkin@almaden.ibm.com)
Racetrack Memories

Sorin Cristoloveanu, ENSERG (sorin@enserg.fr)
SOI Floating Body Memories

Session A2 VLSI Modelling, Reliability, and 3-D Integration

13:30

Chair1: Kambiz Moez, University of Alberta (kambiz@ualberta.ca)

Chair2: Masaharu Imai, Osaka University (imai@ist.osaka-u.ac.jp)

Dmitri Strukov, University of California, Santa Barbara (strukov@ece.ucsb.edu)
High Precision Tuning of Resistive State in Pt/TiO₂-x/Pt and Ag/a-Si/Pt Thin-Film Devices

Tibor Grasser, Technische Universität Wien (grasser@iue.tuwien.ac.at) with F. Schanovsky
Bias Temperature Instabilities in Highly-Scaled MOSFETs

Laurent Fesquet, Grenoble Institute of Technology (Laurent.Fesquet@imag.fr)
Controlling Variability and Energy by Design

Tomasz Brozek, University of California, Davis (tomasz.brozek@pdf.com)
Yield Modeling at Nanoscale

Fred Y. Fu, Crosslight Software, Inc. (fred@crosslight.com) with Simon Li
3D TCAD Simulation of Power Semiconductor Devices

Kholdoun Torki, CMP (Kholdoun.Torki@imag.fr)
3-D Integration

Malgorzata Chrzanowska-Jeske, Penn State University (jeske@ece.pdx.edu)
Advantages and Challenges of 3D ICs from the Perspective of a 3D Layout Designer

Alexios Birbas, Universidad Autónoma Metropolitana-Iztapalapa (birbas@ece.upatras.gr) with Nikos Petrellis
Noise Modeling at Various Levels Including ADCs

Nethaji Dharmarasu, Nanyang Technological University (dharma@ntu.edu.sg) with K. Radhakrishnan
Development of AlGaIn/GaN Heterostructures on 100mm Silicon by Molecular Beam Epitaxy

Nobuyuki Sugii, Low-power Electronics Association & Project (LEAP) (n-sugii@leap.or.jp)
Silicon on Thin Buried Oxide (SOTB) Technology for Ultralow-Power (ULP) Applications

July 19, 2012

Session A3 Semiconductor Technologies

10:30

Chair1: Victor Moroz, Synopsis (Victor.Moroz@synopsys.com)

Chair2:

James Chingwei Li, HRL Laboratories (jli@hrl.com)
The Next Generation of Heterogeneously Integrated InPHBTs

Victor Moroz, Synopsis (Victor.Moroz@synopsys.com)
Future Transistor Scaling and Patterning Based on Crystal Self-Assembly

Meishoku Masahara, AIST Japan (m.masahara@aist.go.jp)
Double-Gate FinFET Device Technology for 22nm Node and Beyond

Jerry W. Zimmer, sp3 Diamond Technologies (jzimmer@sp3inc.com)
The Role of High Thermal Conductivity Substrates in Future CMOS Technologies

Thibaut David, CEA/LETI (thibaut.david@cea.fr)
Emerging Solutions for Pattern Transfer at the Nanometric Scale

Session A4 VLSI

13:30

Chair1: Ken Cadien, University of Alberta (kcadien@ualberta.ca)

Chair2:

Anis Daami, CEA-LITEN (anis.daami@cea.fr)
Organic Semiconductor Technology: From Process to Device Applications on Flexible Substrates

Katsuaki Suganuma, Osaka University (suganuma@sanken.osaka-u.ac.jp) with Natsuki Komoda, Masaya Nogi, and Kanji Otsuka
Printing of Flexible Antenna and its Performance

Manuel Quevedo, University of Texas at Dallas (mquevedo@utdallas.edu)
Materials for Flexible Electronics

Gerard Sisó Cuadrado, Universitat Autònoma de Barcelona (Gerard.Siso@uab.cat)
Split Ring Metamaterials: Applications to Microwave Circuit and Antenna Design

Jiro Ida, Kanazawa Institute of Technology (ida@neptune.kanazawa-it.ac.jp)
Status of Super Steep Cut off FETs and Contribution of Floating Body Effect for Ultra Low Power Application

Josh Hihath, Arizona State University (josh.hihath@gmail.com)
Molecular Diodes and Transistors

Mona Hella, Rensselaer Polytechnic Institute (hellam@ecse.rpi.edu)
Wide-band Semiconductors for High Switching Speed Power Converter Circuits

José Flich, Universita Politecnica de Valencia (jflich@disca.upv.es)
Research Challenges in NoCs and an Unified Approach to Solve Them

Michael Taylor, University of California, San Diego (prof.taylor@gmail.com)
GreenDroid: A Post-Multicore Architecture for the Dark Silicon Era

Xiaoqing Wen, Kyushu Institute of Technology (wen@cse.kyutech.ac.jp)
Towards the Next Generation of Power-Aware VLSI Test Technologies

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Session A5 Circuits

10:30

Chair1: Shahriar Mirabbasi, University of British Columbia (shahriar@ece.ubc.ca)

Chair2:

Kenichi Okada, Tokyo Institute of Technology (okada@ssc.pe.titech.ac.jp)
A Millimeter-wave CMOS Transceiver for 10Gb/s Wireless Communication

Harish Krishnaswamy, Columbia University (hk2532@columbia.edu)
mmWave and Sub-mmWave Power Generation in CMOS

Omeed Momeni, University of California, Davis (om53@cornell.edu)
CMOS Terahertz and mm-Wave Electronics: Reaching the Fundamental Limits

Yasunao Katayama, IBM (YASUNAOK@jp.ibm.com)
60GHz mmWave System Demonstrations with High-Performance and Low-Power Single-Carrier Baseband

Sebastian Magierowski, University of Calgary (smagiero@ucalgary.ca)
Parametric Circuits

Session A6 Circuits

13:30

Chair1: Hormoz Djahanshahi, PMC-Sierra (hormoz_djahanshahi@pmc-sierra.com)

Chair2:

Denis Flandre, UC Louvain (denis.flandre@uclouvain.be)
Disruptive Ultra-Low-Leakage Design Techniques for Ultra-Low-Power CMOS Circuits

Hiroshi Fuketa, University of Tokyo (fuketa@iis.u-tokyo.ac.jp)
Ultra-Low Voltage Logic Design for Extremely Low-Power Circuits

Mustafa Badaroglu, IMEC (Mustafa.Badaroglu@imec.be)
Circuit and Product Level Assessment of Emerging Fully Depleted Channel Devices: FinFET and UTBOX-SOI

Mehmet Soyuer, IBM Thomas J. Watson Research Center (soyuer@us.ibm.com)
Advances in Power-Efficient Serial Links

Alyssa B. Apsel, Cornell University (aba25@cornell.edu)
Process Invariant Circuit Design

Akil K Sutton, IBM (aksutton@us.ibm.com)
Analog Performance Benchmarking Techniques for 32 and 22 nm SOI CMOS

Francisco Gamiz, University of Grenada (fgamiz@ugr.es) with N.Rodriguez and S. Cristoloveanu
A-RAM family: Novel Capacitor-Less 1T-DRAM Cells for Beyond 22nm Nodes Compatible with Planar and 3D SOI and Bulk Substrates.

Nasirul Chowdhury, Intel (Nasirul.i.chowdhury@intel.com)
Intel® Core™ i5/i7 QuickPath Interconnect Phase Interpolator

Chulwoo Kim, Korea University (ckim@korea.ac.kr)
Cost-Effective Spread Spectrum Clock Generator

Jeremy Popp, Boeing Research and Technology (jeremy.popp@boeing.com)
An Improved mm-Wave DAC, 20Gbps+ ADC, and Associated SerDes Interfaces

Track B Sensors, Energy, and Communications

July 18, 2012

Session B1 Biomedical Sensors

10:30

Chair1: Vamsy Chodavarapu, McGill University (vamsy.chodavarapu@mcgill.ca)

Chair2:

Massimo De Vittorio, IIT/NNL University of Salento Lecce (massimo.devittorio@unisalento.it)
Advanced Technologies for Tactile Sensing and Actuation

Dietmar Fink, Universidad Autónoma Metropolitana-Iztapalapa (fink@daad-alumni.de) with Salvador Cruz, Yohai Mandabi, Gerardo Muñoz Hernandez , Jiri Vacik, and Arik Kiv
The Use of Confinement in Enzyme-Clad Nanopores for Biosensing

Jerald Yoo, Masdar Institute of Science and Technology (jyoo@masdar.ac.ae)
Patch Sensors for Ambulatory Healthcare: From Technologies to Examples

Daniel Filippini, Linköping University (danfi@ifm.liu.se)
Interfacing Diagnostics with Consumer Electronics

George Cobb, The Institute of Environmental and Human Health (TIEHH) (George.Cobb@TIEHH.TTU.edu)
Personal Diagnostic Sensor for Airborne Toxicants

Session B2 Sensors

13:30

Chair1: Alex Simonian, National Science Foundation (asimonia@nsf.gov)

Chair2:

Heung Bin Lim, Dankook University (plasma@dankook.ac.kr) with J.S. Lee
Chemical Sensing for Contaminant Control in Microelectronics Manufacturing

Gerard Wysocki, Princeton University (gwysocki@princeton.edu) with Yin Wang and Brian Brumfield
Compact Low-Power Faraday Rotation Spectroscopic Trace Gas Sensors

Zhigang Zhu, City University of New York (zzhu@ccny.cuny.edu)
Vision-Aided Automated Vibrometry for Remote Acoustic and Vibration Sensing

Chris Bleakley, University College Dublin (chris.bleakley@ucd.ie)
Wideband Ultrasonic Local Positioning

Antonio Lopez-Martin, Public University of Navarra (antonio.lopez@unavarra.es)
High-Performance Industrial and Automotive Angle Detection Based on GMR Sensors

Chris Giacomponello, Ntera (chris.giacomponello@ntera.com)
Sensor Integration for Smart Cards, Smart Packaging, and Smart Objects

Sameer Sonkusale, Tufts University (sameer@ece.tufts.edu)
CMOS-Nanoscale Sensor Integration

Zeljko Zilic, McGill University (zeljko.zilic@mcgill.ca)
Multi-Sensor Integration: From Devices to Applications and Back

Mutsumi Kimura, Ryukoku University (mutsu@rins.ryukoku.ac.jp)
Thin-Film Sensors Using Thin-Film Transistor Technologies

Konrad Walus, University of British Columbia (konradw@ece.ubc.ca)
Inkjet Printed All-Polymer Gravimetric Sensors

Zhiping (James) Zhou, Peking University (zjzhou@pku.edu.cn)
Silicon Microring Sensors

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Session B3 X-Ray and Infrared Detectors

10:30

Chair1: Juha Kalliopuska, VTT (Juha.Kalliopuska@vtt.fi)

Chair2:

Renato Turchetta, Samsung (renato.turchetta@stfc.ac.uk)
Large Area CMOS Image Sensors for X-Ray Detection

Leonardo Abbene, Università di Palermo (leonardo.abbene@unipa.it) with Gaetano Gerardi and Giuseppe Raso
Digital Pulse Processing Techniques for X-Ray and Gamma Ray Semiconductor Detectors

Yves Bärtling, Helmholtz-Zentrum Dresden-Rossendorf (y.baertling@hzdr.de)
Detector Technologies for Ultrafast X-Ray Tomography

Joseph J. Talghader, University of Minnesota (joey@umn.edu)
High-Sensitivity Infrared Detection and Spectroscopy

Alvaro Peña-Quevedo, Pontifical Catholic University of Puerto Rico (alvarojpena@gmail.com)
Open-Air Mass Spectrometry for the Detection and Analysis of Organic Compounds in Common Products

Session B4 Green Energy and Smart Grids

13:30

Chair1: Juri Jatskevich, University of British Columbia (jurij@ece.ubc.ca)

Chair2:

Alireza Nojeh, University of British Columbia (anojeh@ece.ubc.ca)
Interaction of Light with Carbon Nanotubes: Opportunities for Solar Devices

Arash Takshi, University of British Columbia (arasht@ece.ubc.ca)
Free-Floating Reaction Centers (RCs) versus Attached Monolayer of RCs in Bio-Photovoltaic Devices

Andras G. Pattantyus-Abraham, Quantum Solar Power Corp. (agp@quantumsp.com)
Quantum Solar Technology

Chi Zhou, Illinois Institute of Technology (zhouc@ece.iit.edu)
Frequency Agility in a ZigBee Network for Smart Grid Application

Kip Morison, BC Hydro (Kip.Morison@bchydro.com)
Smart Grid Developments

Abdou Hassanien, AIST Japan (abdou.hassanien@gmail.com)
Superconducting Systems

Bert Nelson, Zenergy Power (Albert.Nelson@zenergypower.com)
Fault Current Limiter

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Session B5 Wireless Communications

10:30

Chair1: Claudio Rey, Fujitsu (claudiogustavore@netscape.net)

Chair2:

Sorin Voinigescu, University of Toronto (sorinv@eecg.toronto.edu)
Towards 1Tbs Radio: Why, When, How?

Shamik Sengupta, John Jay College (ssengupta@jjay.cuny.edu)
Wireless Cognitive Radio Networks

Gaurav Bansal, Toyota InfoTechnology Center (gbansal@us.toyota-itc.com)
Vehicular Communications

Masoud Ardakani, University of Alberta (ardakani@ece.ualberta.ca)
Reliable Communication on Channels with Timing Errors

Fei Yuan, Ryerson University (fyuan@ee.ryerson.ca)
Passive Wireless Microsystems

Reza Mahmoudi, Technical University of Eindhoven (rezamahmoudi.gm@gmail.com) with Foad Arfaei Malekzadeh and Arthur Roermund
Low Frequency Dithering Technique for High Performance Transmitters

Session B6 Wireless Circuits

13:30

Chair1: Reza Mahmoudi, Technical University of Eindhoven (rezamahmoudi.gm@gmail.com)

Chair2:

Hossein Hashemi, University of Southern California (hosseinh@usc.edu)
Human-Feature-Detection Wireless CMOS Sensor

Stephen So, Sentinel Photonics (sso@princeton.edu)
Wireless Sensor Networks of Laser-Based Gas Sensors

Ahmed Abdelgawad, University of Louisiana at Lafayette (ama1916@cacs.louisiana.edu)
Resource-Aware Data Fusion Algorithms for Wireless Sensor Networks

David Wentzloff, University of Michigan (wentzlof@umich.edu)
Harvesting Clocks from Ambient Wireless Signals for Synchronizing Sensor Networks

Zhihua Wang, Tsinghua University (zhihua@tsinghua.edu.cn)
Low Power Wireless Integrated Circuits for Medical Application

Shuenn-Yuh Lee, National Chung Cheng University (ieesyl@ccu.edu.tw)
A Programmable Implantable Micro-Stimulator SoC with Wireless Telemetry

Donald Lie, Texas Tech University (donald.lie@ttu.edu)
Design of Si-Based High-Efficiency RF Power Amplifiers and Transmitters Using Envelope-Tracking for Mobile Broadband Wireless Communications

David R. Jackson, University of Houston (djackson@uh.edu)
Directive Beaming at Microwave and Optical Frequencies using Artificial Surfaces

John L. Volakis, Ohio State University (volakis@ece.osu.edu)
Embroidered Flexible Radio Frequency (RF) Electronics

Marc Rocchi, OMMIC (M.Rocchi@ommic.com)
RF Innovations in III-V

Track C Nanoelectronics and Spintronics

July 18, 2012

Session C1 Nanoelectronics

10:30

Chair1: Heike Riel, IBM Zurich (hei@zurich.ibm.com)

Chair2:

Cherie R. Kagan, University of Pennsylvania (kagan@seas.upenn.edu)

High-Performance Colloidal Semiconductor Nanocrystal Electronics and Optoelectronics

Eric Vogel, Georgia Institute of Technology (eric.vogel@mse.gatech.edu)

Nanoscale Devices and Materials for a Neuromorphic Architecture

Alan Seabaugh, University of Notre Dame (seabaugh.1@nd.edu)

Tunnel Field-effect Transistors - A CMOS Replacement?

Joachim Knoch, Technische Universität Dortmund (joachim.knoch@udo.edu)

III-V Nanowire FETs

Stephen Hersee, University of New Mexico (shersee@chtm.unm.edu)

Challenges of 3D Nanoscale Processing in Advanced Semiconductors

Session C2 Graphene and Carbon Nanotechnology

13:30

Chair1: Alireza Nojeh, University of British Columbia (anojeh@ece.ubc.ca)

Chair2:

Eric Pop, University of Illinois at Urbana-Champaign (epop@illinois.edu)

Carbon Nanoelectronics: Towards Energy-Efficient Computing?

Subhasish Mitra, Stanford University (subh@stanford.edu)

Carbon Nanotube Imperfection-Immune Digital VLSI

Gianluca Fiori, University of Pisa (gfiori@mercurio.iet.unipi.it) with G. Iannaccone

Nanoscale Graphene Device Simulations

Neerav Kharche, Rensselaer Polytechnic Institute (kharcn@rpi.edu)

Electronic Structure and Transport in Graphene-hBN Heterostructures: The Role of Dielectric Screening

Thomas Szkopek, McGill University (thomas.szkopek@mcgill.ca)

Emerging Applications of Graphene Field Effect Transistors

Xiaodong Xu, University of Washington (xuxd@uw.edu)

Ultrafast Graphene Optoelectronics Assisted by Hot-Carrier Transport

Jeffry Kelber, University of North Texas (kelber@unt.edu)
Graphene Growth on Nitrides and Oxides: Implications for Charge and Spin Devices

Sung-Yool Choi, KAIST (sungyool.choi@gmail.com)
Memristive Switching of Graphene Oxide Thin Films: Physics and Applications

Ching-Ting Lee, National Cheng-Kung University (ctlee@ee.ncku.edu.tw)
Electrical Characterization Methods for Graphene Devices

Byoung Hun Lee, GIST (bhl@gist.ac.kr)
Applications of Graphene in Electronics Devices

Yong P. Chen, Purdue University (yongchen@purdue.edu)
Large Scale Transferrable Graphene for Device and Sensing Applications

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Session C3 Nanoelectronics

10:30

Chair1: Konrad Walus, University of British Columbia (konradw@ece.ubc.ca)

Chair2:

Mikhail Dorojevets, Stony Brook University (MiDor@ece.sunysb.edu)
Processor Design with Superconductor Single-flux Quantum Technology

Jeremy Hilton, D-Wave Systems (jphilton@dwavesys.com)
Introduction to the D-Wave One Processor

Bal Sandhu, ARM Inc. (bal.sandhu@arm.com)
Thermal Management for SOC on Sub-Nanometer Process Technology Nodes

Takeo Ohno, National Institute for Materials Science (cnsi@nifty.com)
Psychological Memorization Model and Biological Synaptic Behavior Demonstrated by Atomic Switches

Bich Yen, SOITEC (bich-yen.nguyen@soitecusa.com)
CMOS Technologies Beyond 28 nm

Session C4 Nanoelectronics

13:30

Chair1: Heike Riel, IBM Zurich (hei@zurich.ibm.com)

Chair2:

Andras Kis, École polytechnique fédérale de Lausanne (EPFL) (andras.kis@epfl.ch)
Single-layer MoS₂ Transistors and Circuits

Dominique Drouin, University of Sherbrooke (Dominique.Drouin@USherbrooke.ca)
Room-Temperature Single Electron Transistors and Their Potential Integration on CMOS

Massimo Fischetti, University of Texas at Dallas (max.fischetti@utdallas.edu)
Post-Si-CMOS Devices: Scaling FETs to (beyond?) 10 nm: From Semiclassical to Quantum Models

John Suehle, NIST (john.suehle@nist.gov)
Characterization Challenges for Novel Electronic Devices

Bipin Rajendran, IBM Thomas J. Watson Research Center (brajend@us.ibm.com)
Phase Change Memory Devices for Cognitive Computing

Michael Shur, Rensselaer Polytechnic Institute (shurm@rpi.edu)
Field Effect Transistors for THz Applications

Hosang Yoon, Harvard University (hyoon@seas.harvard.edu)
Inertia-Based Negative Refraction

Azad Naeemi, Georgia Institute of Technology (azad@gatech.edu)
Interconnects for the End of the Roadmap and Beyond

Scott Dunham, University of Washington (dunham@u.washington.edu)
Nanoscale Interconnects

Marc Riedel, University of Minnesota (mriedel@umn.edu)
Logic Synthesis for Nanoscale Switching Lattices

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Session C5 Spintronics

10:30

Chair1: Hanan Dery, Rochester University (hanan.dery@rochester.edu)

Chair2:

Sandipan Pramanik, University of Alberta (pramanik@ece.ualberta.ca)
Current Perpendicular to Plane Magnetoresistance in Ni (111)/Graphene Heterojunctions

Gerrit E.W. Bauer, Tohoku University (g.e.w.bauer@imr.tohoku.ac.jp)
Spin Caloritronics

Kazuya Ando, Tohoku University (ando@imr.tohoku.ac.jp)
Dynamical Spin Injection into Semiconductors

Jaroslav Fabian, University Regensburg (jaroslav.fabian@physik.uni-regensburg.de)
Graphene Spintronics

Berend Jonker, Naval Research Laboratory (Jonker@nrl.navy.mil)
Silicon/Germanium Spintronics: Spin Accumulation and Transport

Sergio Valenzuela, Institut Català de Nanotecnologia (sov@icrea.cat; sov@mit.edu)
Pure Spin Current Generation in a Single Electron Transistor with a Superconducting Island

Nadia El-Masry, National Science Foundation (nelmasry@nsf.gov)
New Materials for Spintronics

Session C6 Spintronics

13:30

Chair1: Konrad Walus, University of British Columbia (konradw@ece.ubc.ca)

Chair2:

Kohei Itoh, Keio University (kitoh@appi.keio.ac.jp)
Silicon Quantum Computing

Byoung-Chul Choi, University of Victoria (bchoi@uvic.ca)
Magnetization Dynamics in Spin-Torque Magnetic Random Access Memory (ST-MRAM) Elements

Russell Cowburn, University of Cambridge (rpc12@cam.ac.uk)
Towards Fully 3-Dimensional MRAM

Viktor Sverdlov, Technische Universität Wien (sverdlov@iue.tuwien.ac.at) with Siegfried Selberherr
MOSFET and Spin Transistor Simulations

Hanan Dery, Rochester University (hanan.dery@rochester.edu) with Igor Zutic
Silicon Spin Communication

Ron Jansen, AIST Tsukuba (ron.jansen@aist.go.jp)
Electrical and Thermal Spintronics in Silicon

Andrew Dzurak, University of New South Wales (a.dzurak@unsw.edu.au)
Coherent Control and Readout of Individual Dopant Spins in a Silicon MOS Nanostructure

Hidekazu Kurebayashi, University of Cambridge (hk295@cam.ac.uk)
Spintronics Using Rotationally Asymmetric Interactions and Magnetic Dynamics

Ian Appelbaum, University of Maryland (appelbaum@physics.umd.edu)
Nonequilibrium Spin-Polarized Electron Transport in Semiconducting Silicon

Kohei Hamaya, Kyushu University (hamaya@ed.kyushu-u.ac.jp)
Electrical Detection of Spin Accumulation in a Si Channel Using a High-Quality Schottky Tunnel Contact

Masashi Shiraishi, Osaka University (shiraishi@ee.es.osaka-u.ac.jp)
Electrical and Dynamical Spin Injection and Transport in Si

Erol Girt, Simon Fraser University (egirt@sfu.ca)
Spin Memory Devices

Track D Embedded Systems and Microsystems

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Session D1 Embedded Systems

10:30

Chair1: Dan Gale, CMC Microsystems (dan.gale@cmc.ca)

Chair2:

Sebastian Fischmeister, University of Waterloo (sfischme@uwaterloo.ca)

Code Instrumentation With Non-Functional Properties

Sungho Park, Penn State University (szp142@cse.psu.edu)

Embedded Systems for Video Analytics

Theresa S. Mayer, Penn State University (tsm2@psu.edu)

Deterministic Assembly to Add New Biosensing Capabilities to Si CMOS

Sathish Gopalakrishnan, University of British Columbia (sathish@ece.ubc.ca)

Task Adaptation in Real-Time and Embedded Systems

Gene Frantz, Texas Instruments (genf@ti.com)

DSP Architectures

Session D2 Embedded Systems

13:30

Chair1: Lesley Shannon, Simon Fraser University (lshannon@ensc.sfu.ca)

Chair2:

Markus Levy, Embedded Microprocessor Benchmark Consortium (markus.levy@eembc.org)

Embedded Processor Benchmarking Strategy: From the Microcontroller to the System

Pierluigi Nuzzo, University of California, Berkeley (nuzzo@eecs.berkeley.edu)

System-Level Design of Analog and Mixed-Signal Circuits Using Contracts

Mark Benson, Logic PD (mark.benson@logicpd.com)

Trading Power and Performance to Achieve Optimal Thermal Design for Battery-Powered Devices

Sherief Reda, Brown University (sherief_reda@brown.edu)

Addressing the Thermal Challenges in Emerging Computing Platforms

Luca Benini, University of Bologna (luca.benini@gmail.com)

Managing SoCs Beyond Their Thermal Design Power

Khan Wahid, University of Saskatchewan (khan.wahid@usask.ca)

iBRIDGE2 – Low Cost VLSI Architecture for Random Access of Pixel-Blocks in Modern Image Sensors

Ikhwana Elfitri, University of Surrey (I.Elfitri@surrey.ac.uk)
Multichannel Audio Coding Based on Analysis by Synthesis

Brett Smolenski, US Army (Brett.Smolenski.ctr@rl.af.mil)
Usable Signal Processing: A Filterless Approach to Interference and Distortion

Emil Jovanov, University of Alabama (emil.jovanov@uah.edu)
Hardware Development for Wearable Technology

Frederik Zilly, Fraunhofer Institute (frederik.zilly@hhi.fraunhofer.de)
3D Stereo Acquisition

July 19, 2012

Session D3 Integrated Microsystems

10:30

Chair1: Bonnie Gray, Simon Fraser University (bgray@sfu.ca)

Chair2:

Ian McWalter, CMC Microsystems (McWalter@cmc.ca)
emSYSCAN R&D Infrastructure for Microsystems Development

Yvon Savaria, Ecole Polytechnique Montreal (yvon.savaria@polymtl.ca) with Mikael Guillemot, Hai Nguyen, Yves Blaquièrè, Ahmed Lakhssassi, Pierre Popovic, and Mary Shields
Technologies at the Heart of a Wafer Scale Rapid Prototyping Electronic System

Kris Myny, IMEC (myny@imec.be)
An Organic Microprocessor on Plastic Foil

Kiyokazu Yasuda, Osaka University (yasuda@mapse.eng.osaka-u.ac.jp)
Micro-Joining by Means of Self-Organization Method

Jayna Sheats, Terapac (sheats@terepac.com)
Flexible Multichip Modules by Photoprinting Circuit Assembly

Leonardo Barboni, Universidad de la República (lbarboni@fing.edu.uy)
Toward the Collaborative Information Processing in Wireless Sensors Network: Emerging Challenges for Microsystems and Programming Models

Session D4 MEMS

13:30

Chair1: Mu Chiao, University of British Columbia (muchiao@gmail.com)

Chair2:

Dana Weinstein, Massachusetts Institute of Technology (dana@mtl.mit.edu)
Active RF and mm-Wave MEMS Resonators Using Transistor Sensing

Jalinous (Jay) Esfandyari, STMicroelectronics Inc. (jalinous.esfandyari@st.com)

Emerging MEMS Sensor Fusion Enables New Applications

Laurent Francis, Université catholique de Louvain (laurent.francis@uclouvain.be) with Sylvain Druart, Nicolas André, Petros Gkotsis, Denis Flandre, and Jean-Pierre Raskin

Magnetic Sensors Enabled by MEMS and SOI Technologies

Mu Chiao, University of British Columbia (muchiao@gmail.com)

*Drug Delivery Using MEMS Device or
Bioimaging Using MEMS Microlens*

Sang-Gook Kim, Massachusetts Institute of Technology (sangkim@mit.edu)

Ultra-Wide Bandwidth Micro Energy Harvesting

André Guedes, University of California, Berkeley (aguedes@eecs.berkeley.edu)

Micromechanically-Enhanced Magnetoresistive Sensors for Ultra Low Magnetic Field Detection

Dongwook Kim, Samsung (steve7.kim@samsung.com)

Analog Front-End ASIC Design for Capacitive Micromachined Ultrasonic Transducer (CMUT)

Vikas Choudhary, Analog Devices (vikas_choudhary@hotmail.com)

2-axis MEMS Gyroscope System for Optical Image Stabilization (OIS).

Elad Alon, University of California, Berkeley (elad@eecs.berkeley.edu)

Integrated Circuit Design with Nano-Electro-Mechanical Relays

Marcin Marzencki, Simon Fraser University (mjm11@sfu.ca)

MEMs Energy Harvesting

July 20, 2012

Session D5 Integrated Microsystems

10:30

Chair1: Laurent Francis, Université catholique de Louvain (laurent.francis@uclouvain.be)

Chair2:

Elvira Fortunato, New University of Lisbon (emf@fct.unl.pt) with Rodrigo Martins

Transparent Electronics: From n to p-type Oxide Based Thin Film Transistors

Tom Jackson, Penn State University (tnj1@psu.edu)

Opportunities for Active Thin Film Electronics

Keon Jae Lee, KAIST (keonlee@kaist.ac.kr)

High Performance Flexible Inorganic Electronic Systems

Rodrigo Martins, UNINOVA (rm@uninova.pt)

CMOS Circuits on Paper Create Potential For Flexible, Cheap, Low Power, Recyclable Electronics

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

Complying with Compliancy: Applications of Flexible Polymers to Microfluidic Systems

Session D6 Energy Harvesting

13:30

Chair1: Peyman Servati, University of British Columbia (peymans@ece.ubc.ca)

Chair2: Madhu Bhaskaran, RMIT University (madhu.bhaskaran@rmit.edu.au)

Shantanu Chakrabartty, Michigan State University (shantanu@egr.msu.edu)

Asynchronous Self-powered CMOS Circuits for Structural Health Monitoring

Jordi Colomer-Farrarons, University of Barcelona (jcolomerf@el.ub.edu) with Pere Miribel-Catala, Esteve Juanola-Feliu and Josep Samitier

Ultra Low-Power Harvesting Body Centered Electronics for Next Portable Devices

Sharath Sriram, RMIT University (sharath.sriram@rmit.edu.au) with Madhu Bhaskaran, Simon Ruffell, and Arnan Mitchell

Nanoscale Characterisation of Energy Generation from Piezoelectric Thin Films

Isaku Kanno, Kobe University (kanno@mech.kobe-u.ac.jp)

Piezoelectric Energy Harvesters of Lead-Free (K, Na)NbO₃ Thin Films

Sang-Woo Kim, Sungkyunkwan University (kimsw1@skku.edu)

Piezoelectric Semiconducting Nanostructure-Based Energy Harvesting: Fundamentals and Technical Issues

Terry J. Hendricks, Battelle Memorial Institute (hendrickst@battelle.org)

New Progress and Frontiers in Thermoelectric Power Generation

E. Rusli, Nanyang Technological University (erusli@ntu.edu.sg) with Lining He, Hao Wang, Donny Lai, and Changyun Jiang

Simple Approach and Efficient Si-PEDOT: PSS Hybrid Solar Cell with Micro/Nano Surface Texturing of Si Nanowires on Pyramids

Bozena Kaminska, Simon Fraser University (kaminska@sfu.ca) with Bernard Courtois

Polymer Printable System for Powering Handheld Devices and Houses: Solar Energy Harvested and Stored

Radhakrishna (Suresh) Sureshkumar, Syracuse University (rsureshk@syr.edu) with T. Cong, S.N. Wani, and P. Paynter

Multicomponent Plasmonic Nanogels for Solar Energy Capture

Gabriel Rincón-Mora, Georgia Institute of Technology (rincon-mora@gatech.edu)

Energy-Harvesting Integrated Circuits

Track E Biomedical and Imaging

July 18, 2012

Session E1 Bioelectronics

10:30

Chair1: Anthony Guiseppi-Elie, Clemson University (guiseppi@clemson.edu)

Chair2:

Urs Frey, RIKEN (ufrey@riken.jp)

Interfacing Neurons with CMOS-Based Microelectrode Arrays

Jitendran Muthuswamy, Arizona State University (jit@asu.edu)

Adaptive Neural Interfaces Using MEMS

Sam Musallam, McGill University (sam.musallam@mcgill.ca)

Integrated Cognitive Brain Machine Interfaces

Albert Titus, University at Buffalo (ahtitus@buffalo.edu)

CMOS Neural Information Processing Microsystems

Vamsy Chodavarapu, McGill University (vamsy.chodavarapu@mcgill.ca)

Integrated Silicon Neural Prosthetic Microsystems

Session E2 Bioelectronics

13:30

Chair1: Sandro Carrera, École Polytechnique Fédérale de Lausanne (sandro.carrera@epfl.ch)

Chair2:

Orly Yadid-Pecht, University of Calgary (orly.yp@gmail.com)

Biology Meeting Electronics

Hogan Yu, Simon Fraser University (hogan_yu@sfu.ca)

Computer-Readable bioDiscs for Molecular Diagnostics

Seila Selimovic, Harvard University (sselimovic@rics.bwh.harvard.edu)

State-of-the-Art Lab-on-a-Chip: Advances in Microfluidic Screening for Cell and Drug Development Applications

J-C Chiao, University of Texas at Arlington (jcchiao@uta.edu)

Implantable Wireless Medical Devices for Endoluminal Applications

Toshihiko Noda, NAIST (t-noda@ms.naist.jp)

Flexible Retinal Prosthesis Device with CMOS Microchip

Masahiro Shimizu, Osaka University (m-shimizu@ist.osaka-u.ac.jp)

Muscle Cell Actuator toward Biorobotic Systems Controlled by a Photostimulation

Phil Collins, University of California, Irvine (collinsp@uci.edu)
Robust Nanocircuits for Sensing Real Time Biomolecule Dynamics

Jean-Pierre Delplanque, University of California, Davis (delplanque@ucdavis.edu)
Breath Sensors

Ali Tehrani, Zymeworks (ali@zymeworks.com)
Building Better Biologics

July 19, 2012

Session E3 Medical Imaging

10:30

Chair1: Purang Abolmaesumi, University of British Columbia (purang@ece.ubc.ca)

Chair2:

Adam Wax, Duke University (a.wax@duke.edu)
Molecular Imaging True Color Optical Coherence Tomography

Jae Sung Lee, Seoul National University (jaes@snu.ac.kr)
Silicon Photomultiplier (SiPM) PET/MRI

James Lacefield, University of Western Ontario (jlacefie@uwo.ca)
Automated Tuning of Power Doppler Ultrasound Acquisition Parameters for Microvascular Imaging

Aaron Fenster, Robarts Research Institute (afenster@imaging.robarts.ca)
3D Ultrasound Imaging for Diagnosis and Therapy

Mary-Ann Mycek, University of Michigan (mycek@umich.edu)
Optical Diagnostics for Cancer Detection

Session E4 Imaging

13:30

Chair1: Orly Yadid-Pecht, University of Calgary (orly.ypp@gmail.com)

Chair2:

Feruz Ganikhanov, West Virginia University (feruz.ganikhanov@mail.wvu.edu) with S. Yang and S. Adhikari
Multi-Modal Molecular Sensitive Imaging Using Two Independently Tunable Optical Parametric Oscillators

Masayuki Ikebe, Hokkaido University (ikebe@ist.hokudai.ac.jp)
An Intelligent CMOS Imager with Negative Feedback Resetting and its Application

Sabine Süssstrunk, École Polytechnique Fédérale de Lausanne (sabine.susstrunk@epfl.ch)
The Opportunities and Challenges of 4-Channel (RGB+NIR) Image Acquisition on a Single Sensor

Zachary Smith, University of California, Davis (zsmith@ucdavis.edu) with Kaiqin Chu and Sebastian Wachsmann-Hogiu
Cell Phone Microscopy and Spectroscopy for Biomedical and Education Applications

Vesna Sossi, University of British Columbia (vesna@phas.ubc.ca)

Recent Advances in PET Imaging

Ian Papautsky, University of Cincinnati (ian.papautsky@uc.edu)

CMOS Fluorescence Imaging for Point-of-Care Sensing and Microfluidics

Klaus Suhling, King's College London (klaus.suhling@kcl.ac.uk)

Fluorescent Molecular Rotors to Map Microviscosity in Cells

Rainer Martini, Stevens Institute of Technology (rmartini@stevens.edu)

New Concept for Mid- and Far IR Imaging Technology and Application in Marine Systems

July 20, 2012

Session E5 Bionanotechnology

10:30

Chair1: Karen C. Cheung, University of British Columbia (kcheung@ece.ubc.ca)

Chair2:

Christof Teuscher, Portland University (teuscher@pdx.edu)

Non-Boolean Computation in Emerging Nano and Bio Devices

Haitao Liu, University of Pittsburgh (hliu@pitt.edu)

DNA-Based Molecular Lithography with Sub-10 nm Resolution

Brian T. Cunningham, University of Illinois at Urbana-Champaign (bcunning@illinois.edu)

Flexible Optical Nanosensors in Disposable Biomedical Tubing

Ali Khademhosseini, Harvard Medical School (alik@rics.bwh.harvard.edu)

Microengineered Biomaterials for Tissue Fabrication and Stem Cell Bioengineering

Marco Rolandi, University of Washington (rolandi@u.washington.edu)

Polysaccharide Nanofibers for Implantable Protonics and Neural Interfacing

Session E6 Bionanotechnology

13:30

Chair1: Daniel M. Ratner, University of Washington (daniel.m.ratner@gmail.com)

Chair2:

Monika Weber, Yale University (monika.weber@yale.edu) with Aleksander Vacic, Nitin Rajan, Xuexin Duan, Tarek Fahmy and Mark A. Reed

CMOS Nanowire Biosensing Systems

Hongbin Yu, Arizona State University (Hongbin.Yu@asu.edu) with Baoquan Ding, Hao Wu, Wei Xu, Zhao Zhao, Yan Liu, and Hao Yan

Interconnecting Gold Islands on Surface with DNA Origami Nanotubes

Ashwin Gopanath, Caltech University (ashwing@caltech.edu)

Microscale Integration of Nanobreadboards: Placement and Orientation of DNA Origami

Nick Kam Hon, University of California, Los Angeles (kamyan@ucla.edu) with Zory Shaposhnik, Eric D. Diebold, Fuyuhiko Tamanoi, and Bahram Jalali

Engineering the Biodegradability of Porous Silicon Nanoparticles for Drug Delivery

Hao Zeng, Buffalo University (haozeng@buffalo.edu)

Magnetic Nanoparticles for Biological Applications

Ramesh Agarwal, Washington University in St. Louis (agarwalr@seas.wustl.edu)

Multiscale Simulations of Atmospheric Aerosols and Nanoparticles, for Understanding of Health Effects

Aihua Liu, Chinese Academy of Sciences (liuah@qibebt.ac.cn)

Nanoparticles-Enhanced DNA Microarray

Murat Elcin, Ankara University (elcin@ankara.edu.tr)

Stem Cells and Biomimetic Materials for Tissue Engineering and Regenerative Medicine

Track F Photonics

July 18, 2012

Session F1 Nanophotonics

10:30

Chair1: Reuven Gordon, University of Victoria (reuven.gordon@gmail.com)

Chair2:

Mo Li, University of Minnesota (moli@umn.edu)

Make Light Do the Work: Harnessing Optical Forces in Nanophotonics

Trevor James Hall, University of Ottawa (tjhall@uottawa.ca)

Nanostructured Components for Si Photonics

Will Green, IBM (wgreen@us.ibm.com) with B. Kuyken, X. Liu, M. A. Van Camp, S. Assefa, D. M. Gill, T. Barwicz, S. M. Shank, Y. A. Vlasov, R. M. Osgood, R. Baets and G. Roelkens

Chip-Scale Mid-Infrared Applications Enabled by Nonlinear Silicon Nanophotonics

Marko Lončar, Harvard University (loncar@seas.harvard.edu)

Nanophotonics with Diamond and Silicon

James Schuck, Lawrence Berkeley National Laboratory (pjschuck@lbl.gov)

Nanoscale Optical Imaging Spectroscopy

Session F2 Photonics

13:30

Chair1: Lukas Chrostowski, University of British Columbia (lukasc@ece.ubc.ca)

Chair2:

Dragomir Neshev, Australian National University (dragomir.neshev@gmail.com)

Non-Diffracting Plasmon Beams: Steering Surface Plasmons on a Chip

Joyce Poon, University of Toronto (joyce.poon@utoronto.ca)

Dynamics of Micro- and Nano-Scale Optical Resonators

Jian Liu, PolarOnyx (jianliu@polaronyx.com)

Ultrafast Fiber Lasers for Biomedical Imaging and Material Processing

Dayan Ban, University of Waterloo (dban@uwaterloo.ca)

THz Quantum Cascade Lasers—A Canadian Approach Towards High-Performance Operation

Peter Loock, Queens University (hploock@chem.queensu.ca)

Vibration Sensing with Fiber Fabry-Perot Cavities: the Photonic Guitar Pickup

Sasan Fathpour, University of Central Florida (fathpour@creol.ucf.edu)

Mid-Infrared Silicon Photonics

Gottipaty Rao, Adelphi University (rao@adelphi.edu)

High Sensitivity Detection of NO₂ at ppt Level

Mark Zondlo, Princeton University (mzondlo@princeton.edu)

Laser-Based Sensors From the Surface to the Stratosphere: New Insights Into Global Climate Change

Reuven Gordon, University of Victoria (reuven.gordon@gmail.com)

Optical Antennas: Theory, Experiment and Applications

James Chon, Swinburne University of Technology (JChon@groupwise.swin.edu.au)

Metallic Nanorod-Based Optical Storage and Patterning: Challenges Ahead

July 19, 2012

Session F3 Silicon Photonics

10:30

Chair1: Lukas Chrostowski, University of British Columbia (lukasc@ece.ubc.ca)

Chair2:

Davide Bertozzi, Università di Ferrara (brtdvd@unife.it)

A Cross-Layer Approach to the Design and Evaluation of Optical Network-on-Chip Topologies

Shayan Mookherjea, University of California, San Diego (smookherjea@eng.ucsd.edu)

Hundreds of Microring Resonators: Towards Overcoming Disorder Effects in Silicon Photonics

Martijn Heck, University of California, Santa Barbara (mheck@ece.ucsb.edu)
Hybrid Silicon Photonics for Optical Interconnects

Keren Bergman, Columbia University (kb2028@columbia.edu)
Design Methodologies and Challenges of Chip-Scale Silicon Photonic Interconnects for High-Performance Computing

Siegfried Janz, National Research Council Canada (siegfried.janz@nrc-cnrc.gc.ca)
Silicon Photonic Wire Sensor Array

Session F4 Photonics

13:30

Chair1: Reuven Gordon, University of Victoria (reuven.gordon@gmail.com)

Chair2:

Peter Devore, University of California, Los Angeles (pdevore@ucla.edu) with D. R. Solli, C. Ropers, P. Koonath and B. Jalali
Energy Efficient and Stable Supercontinuum Generation in Silicon

Pavle Radovanovic, University of Waterloo (pavler@uwaterloo.ca)
Tuning Optical Properties in Colloidal Transparent Conducting Oxide Nanostructures by Defect Interactions

Nader Engheta, University of Pennsylvania (engheta@ee.upenn.edu)
Optical Metatronics

Steve Blair, Utah University (blair@ece.utah.edu)
UV Plasmonics

Lucio Pancheri, Fondazione Bruno Kessler (pancheri@fbk.eu)
Advances in SPAD Arrays for Time-Gated Fluorescence Detection

Paul Charette, University of Sherbrooke (Paul.G.Charette@usherbrooke.ca)
CMOS Buried Quad p-n Junction Photodetector for Multi-Wavelength Analysis

George Barbastathis, Massachusetts Institute of Technology (gbarb@mit.edu)
On the Application of the Wigner Distribution Function to Quantitative Imaging

Solomon Assefa, IBM (sassefa@us.ibm.com) with William M. J. Green, Alexander Rylyakov, Clint Schow, Folkert Horst and Yurii A. Vlasov
CMOS-Integrated Nanophotonics for Optical Interconnects in Exascale Supercomputers