

ICRC 2017 Schedule at a Glance

Tuesday November 7		Wednesday November 8		Thursday November 9	
		Continental breakfast (Foyer)		Continental breakfast (Foyer)	
8:00-8:15 AM		Welcoming remarks (Ballroom Salon II-III)			
8:15-8:45 AM		Opening Address Dr. Hava Siegelmann (DARPA) <i>DARPA's Vision for the Future of Computing</i> (Ballroom Salon II-III)		8:15-8:45 AM Opening Address Dr. Robinson Pino (DOE) <i>DOE Vision and Programmatic Activities in Advanced Computing Technologies</i> (Ballroom Salon II-III)	
8:45-9:30 AM		Plenary Talk Prof. Karlheinz Meier (Heidelberg University) <i>Continuously Learning Neuromorphic Systems with High Biological Realism</i> (Ballroom Salon II-III)		8:45-9:30 AM Plenary Talk Prof. Margaret Martonosi (Princeton University) <i>End of Moore's Law Challenges and Opportunities: Computer Architecture Perspectives</i> (Ballroom Salon II-III)	
		Coffee break (Foyer)		Coffee break (Foyer)	
9:45-11:45 AM		Session 1A Neuromorphic Computing 1 (Plaza)	Session 1B Beyond CMOS (Colonnade)	9:45-11:35 AM Session 4A Neuromorphic Computing 3 (Plaza)	Session 4B Energy-efficient and Adiabatic Computing (Colonnade)
11:45 AM - 1:00 PM		Buffet Lunch (provided) (Ballroom Salon I)		11:45 AM - 1:00 PM Box Lunch (provided) (Ballroom Salon I) Poster Session (Foyer outside Ballroom Salon II-III)	
1:05-1:50 PM		Plenary Talk Prof. Robert Schoelkopf (Yale University) <i>The Prospects for Quantum Computing with Superconducting Circuits</i> (Ballroom Salon II-III)		1:05-1:50 PM Plenary Talk Prof. Luis Ceze (University of Washington) <i>Borrowing from Nature to Build Better Computers</i> (Ballroom Salon II-III)	
2:00-4:00 PM		Session 2A Neuromorphic Computing 2 (Plaza)	Session 2B Special Session on Future EDA (Colonnade)	2:00-4:00 PM Session 5A Quantum Computing (Plaza)	Session 5B Novel Architectures and Near-memory Computing (Colonnade)
		Coffee break (Foyer)		Coffee break (Foyer)	
4:15-6:15 PM		Session 3A Algorithms and Applications (Plaza)	Session 3B Quantum and Special Purpose Annealers (Colonnade)	4:15-6:25 PM Session 6A Optical Computing (Plaza)	Session 6B Probabilistic Computing and Nonlinear Dynamics (Colonnade)
6:30 PM	Joint IRDS/ICRC Reception (Old Dominion)	6:30 PM	ICRC Banquet (Ballroom Salon II-III + Prefunction area)	6:30 PM	Joint ICRC/Industry Summit Reception (Ballroom Salon II-III + Prefunction area)
		7:45 – 9:15 PM	Special Evening Panel Discussion <i>AI, Cognitive Information Processing, and Rebooting Computing</i> (Ballroom Salon II-III)		

Registration:

7am-5pm all days

Foyer area of Ballroom Salon II-III (5th floor)

Speaker preparation:

Attache Room

Wednesday November 8: Regular and Special Sessions

Session 1A: Neuromorphic Computing 1 Plaza Room 9:45-11:45 AM Chair: Thomas Van Vaerenbergh

1A.1 9:45-10:15 AM	Aaron J. Hill (Sandia National Laboratories) <i>A Spike-Timing Neuromorphic Architecture</i>
1A.2 10:15-10:45 AM	Stanislaw Wozniak (IBM Research, Zurich) <i>Feature Learning using Synaptic Competition in a Dynamically-Sized Neuromorphic Architecture</i>
1A.3 10:45-11:05 AM	Yan Fang (University of Pittsburgh) <i>Achieving Swarm Intelligence with Spiking Neural Oscillators</i>
1A.4 11:05-11:25 AM	Reginald Meeson (Institute for Defense Analyses) <i>Auditory Neural Pathway Simulation</i>
1A.5 11:25-11:45 AM	Michael Schneider (National Inst. of Standards and Technology) <i>Energy Efficient Single Flux Quantum Based Neuromorphic Computing</i>

Session 2A: Neuromorphic Computing 2 Plaza Room 2:00-4:00 PM Chair: Matt Marinella

2A.1 2:00-2:30 PM	Geoffrey Burr (IBM Research, Almaden) <i>Improved Deep Neural Network Hardware Accelerators Based on Non-Volatile-Memory: the Local Gains Technique</i>
2A.2 2:30-3:00 PM	David Mountain (US Department of Defense) <i>A Comparison Between Single Purpose and Flexible Neuromorphic Processor Designs</i>
2A.3 3:00-3:30 PM	Sumit Kumar Jha (University of Central Florida) <i>Flow-based Non-volatile Memory Crossbar Accelerators for Parallel Computations</i>
2A.4 3:30-4:00 PM	Aidana Irmanova (Nazarbayev University) <i>Neuromorphic Adaptive Edge-preserving Denoising Filter</i>

Session 3A: Algorithms and Applications Plaza Room 4:15-6:15 PM Chair: David Mountain

3A.1 4:15-4:45 PM	Invited: Dejan Milojicic (Hewlett Packard Labs) <i>Generalize or Die: Operating System Support for Memristor-based Accelerators</i>
3A.2 4:45-5:15 PM	Mohsen Imani (University of California, San Diego) <i>VoiceHD: Hyperdimensional Computing for Efficient Speech Recognition</i>
3A.3 5:15-5:35 PM	Bicky Marquez (Institut FEMTO-ST) <i>Embedding in Neural Networks: A-priori Design of Hybrid Computers for Prediction</i>
3A.4 5:35-5:55 PM	Dillon Graham (Rochester Institute of Technology) <i>Convolutional Drift Networks for Spatio-Temporal Processing</i>
3A.5 5:55-6:15 PM	Wafi Danesh (University of Missouri, Kansas City) <i>A New Approach for Multi-Valued Computing Using Machine Learning</i>

Session 1B: Beyond CMOS Colonnade Room 9:45-11:45 AM Chair: Larry Clevenger

1B.1 9:45-10:15 AM	Invited: Puneet Gupta (University of California, Los Angeles) <i>Advanced Packaging and Heterogeneous Integration to Reboot Computing</i>
1B.2 10:15-10:45 AM	Himanshu Thapliyal (University of Kentucky) <i>Low-Power and Secure Lightweight Cryptography Via TFET-Based Energy Recovery Circuits</i>
1B.3 10:45-11:05 AM	Sébastien Le Beux (Ecole Centrale de Lyon) <i>Hybrid Topologies for Reconfigurable Matrices Based on Nano-Grain Cells</i>
1B.4 11:05-11:25 AM	Naveen Kumar Macha (University of Missouri, Kansas City) <i>A New Concept for Computing using Interconnect Crosstalks</i>
1B.5 11:25-11:45 AM	Ronald DeMara (University of Central Florida) <i>Heterogeneous Technology Configurable Fabrics for Field Programmable Co-design of CMOS and Spin-based Devices</i>

Session 2B: Special Session on Future EDA: Next Generation Design Automation for Accelerating the Reboot Colonnade Room 2:00-4:00 PM Organizers: Shishpal Rawat & Ayse K. Coskun

2:00-2:10 PM	Shishpal Rawat & Ayse K. Coskun <i>Welcome and Overview</i>
2B.1 2:10-2:35 PM	Arijit Raychowdhury (Georgia Institute of Technology) <i>EDA Challenges in Designing Computing Systems with post-CMOS Devices</i>
2B.2 2:35-3:00 PM	Shobha Vasudevan (University of Illinois, Urbana-Champaign) <i>Verification in the Nanoscale Era of Computing</i>
2B.3 3:00-3:25 PM	Yu (Kevin) Kao (University of California, San Diego) <i>Random Sparse Adaptation for Accurate Inference with Inaccurate RRAM Arrays</i>
2B.4 3:25-3:50 PM	Douglas Densmore (Boston University) <i>How Bio-Design Automation Can Help Reboot Computing: Lessons, Challenges, and Future Directions</i>
3:50-4:00 PM	<i>Q&A and Final Thoughts</i>

Session 3B: Quantum and Special Purpose Annealers Colonnade Room 4:15-6:15 PM Chair: William Vanderlinde

3B.1 4:15-4:45 PM	Takuya Okuyama (Hitachi Ltd.) <i>An Ising Computer Based on Simulated Quantum Annealing by Path Integral Monte Carlo</i>
3B.2 4:45-5:15 PM	Zachary Baker (Los Alamos National Laboratories) <i>An FPGA-Quantum Annealer Hybrid System for Wide-Band RF Detection</i>
3B.3 5:15-5:45 PM	Georg Hahn (Imperial College London) <i>Reducing Binary Quadratic Forms for More Scalable Quantum Annealing</i>
3B.4 5:45-6:15 PM	Nga Nguyen (Los Alamos National Laboratories) <i>Solving Sparse Representation for Image Classification using Quantum D-Wave 2X Machine</i>

Thursday November 9: Regular Sessions

Session 4A: Neuromorphic Computing 3 Plaza Room 9:45-11:35 AM Chair: John Paul Strachan

4A.1 9:45-10:15 AM	Invited: Todd Hylton (University of California, San Diego) <i>On Thermodynamics and the Future of Computing</i>
4A.2 10:15-10:45 AM	James Plank (University of Tennessee, Knoxville) <i>A Unified Hardware/Software Co-Design Framework for Neuromorphic Computing Devices and Applications</i>
4A.3 10:45-11:15 AM	Robin Jacobs-Gedrim (Sandia National Laboratories) <i>Impact of Linearity and Write Noise of Analog Resistive Memory Devices in a Neural Algorithm Accelerator</i>
4A.4 11:15-11:35 AM	Baibhab Chatterjee (Purdue University) <i>An Energy-Efficient Mixed-Signal Neuron for Inherently Error-Resilient Neuromorphic Systems</i>

Session 4B: Energy-efficient and Adiabatic Computing Colonnade Room 9:45-11:35 AM Chair: Larry Clevenger

4B.1 9:45-10:15 AM	Michael Frank (Sandia National Laboratories) <i>Asynchronous Ballistic Reversible Computing</i>
4B.2 10:15-10:45 AM	Nicolas Jeannot (CNRS-LIRMM/University of Montpellier) <i>Synchronised 4-Phase Resonant Power Clock Supply for Energy Efficient Adiabatic Logic</i>
4B.3 10:45-11:15 AM	Yann Perrin (University Grenoble Alpes/CEA-LETI) <i>Low-energy Computation with Mechanical Encoding : Towards Truly Adiabatic Operation</i>
4B.4 11:15-11:35 AM	Neal Anderson (University of Massachusetts, Amherst) <i>Architecture and Dissipation: Thermodynamic Costs of General Purposeness in von Neumann Processors</i>

Session 5A: Quantum Computing Plaza Room 2:00-4:00 PM Chair: William Vanderlinde

5A.1 2:00-2:30 PM	Invited: Jerry Chow (IBM Research, Yorktown) <i>Building a Quantum Computing Community and Ecosystem</i>
5A.2 2:30-3:00 PM	Travis Humble (Oak Ridge National Laboratory) <i>Quantum Accelerators for High-Performance Computing Systems</i>
5A.3 3:00-3:20 PM	Stewart Allen (IonQ Inc) <i>Reconfigurable and Programmable Ion Trap Quantum Computer</i>
5A.4 3:20-3:40 PM	Enrico Prati (CNR - Istituto di Fotonica e Nanotecnologie) <i>From the Quantum Moore's Law toward Silicon Based Universal Quantum Computing</i>
5A.5 3:40-4:00 PM	Fernando Corinto (Politecnico di Torino) <i>Physical Constraints on Quantum Circuits</i>

Session 5B: Novel Architectures and Near-memory Computing Colonnade Room 2:00-4:00 PM Chair: Arvind Kumar

5B.1 2:00-2:30 PM	Invited: Wen-mei Hwu (University of Illinois, Urbana-Champaign) <i>Rebooting the Data Access Hierarchy in Computing Systems</i>
5B.2 2:30-3:00 PM	Sriveshan Srikanth (Georgia Institute of Technology) <i>The Superstrider Architecture: Integrating Logic and Memory towards non-von Neumann Computing</i>
5B.3 3:00-3:30 PM	Mohsen Imani (University of California, San Diego) <i>NNgine: Ultra-Efficient Nearest Neighbor Accelerator Based on In-Memory Computing</i>
5B.4 3:30-4:00 PM	Tarek Taha (University of Dayton) <i>Socrates-D: Multicore Architecture for On-line Learning</i>

Session 6A: Optical Computing Plaza Room 4:15-6:25 PM Chair: Erik Debenedictis

6A.1 4:15-4:45 PM	Sébastien Le Beux (Ecole Centrale de Lyon) <i>An Energy-efficient Reconfigurable Nanophotonic Computing Architecture Design: Optical Lookup Table</i>
6A.2 4:45-5:05 PM	Stefan Abel (IBM Research – Zurich) <i>Multi-Level Optical Weights in Integrated Circuits</i>
6A.3 5:05-5:25 PM	Matthias Freiberger (Ghent University - imec) <i>On-chip Passive Photonic Reservoir Computing with Integrated Optical Readout</i>
6A.4 5:25-5:45 PM	Jonathan George (The George Washington University) <i>Towards On-Chip Optical FFTs for Convolutional Neural Networks</i>
6A.5 5:45-6:05 PM	Zeb Barber (Montana State University) <i>Spatial-Spectral Materials for High Performance Optical Processing</i>
6A.6 6:05-6:25 PM	Thomas Van Vaerenbergh (Hewlett Packard Labs) <i>Demonstration of a Coherent Tunable Amplifier for All-optical Ising Machines</i>

Session 6B: Probabilistic Computing and Nonlinear Dynamics Colonnade Room 4:15-6:25 PM Chair: Neal Anderson

6B.1 4:15-4:45 PM	Invited: Sandip Tiwari (Cornell University) <i>On the Physical Underpinnings of the Unusual Effectiveness of Probabilistic and Neural Computation</i>
6B.2 4:45-5:15 PM	Eleonore Vissol-Gaudin (Durham University) <i>Computing Based on Material Training: Application to Binary Classification Problems</i>
6B.3 5:15-5:45 PM	Benham Kia (North Carolina State University) <i>Nonlinear Dynamics and Chaos for Flexible, Reconfigurable Computing</i>
6B.4 5:45-6:05 PM	Natesh Ganesh (University of Massachusetts, Amherst) <i>A Thermodynamic Treatment of Intelligent Systems</i>
6B.5 6:05-6:25 PM	Sourabh Kulkarni (University of Massachusetts, Amherst) <i>Magneto-electric Approximate Computation for Bayesian Inference</i>

Thursday November 9: Poster Session

11:45 AM-1:00 PM Foyer outside Ballroom Salon II-III

INVITED POSTERS

CMOS based Scalable Cryogenic Control Electronics for Qubits	Carsten Degenhardt (Forschungszentrum Jülich GmbH)
Hybrid Cryogenic Memory Cells for Superconducting Computing Applications	Jeng-Bang Yau (IBM T.J. Watson Research Center)
Bayesian Stochastic Machines for Localization of Audio Sources	Raphael Frisch (Université Grenoble Alpes/LIG) Sourabh Kulkarni
Structure Discovery for Gene Expression Networks with Emerging Stochastic Hardware	(University of Massachusetts Amherst) Aby Konampurath George
Design of Computing Circuits using Spatially Localized DNA Majority Logic Gates	(Wayne State University)
Routing Congestion Aware Cell Library Development for Monolithic 3D ICs	Emre Salman (Stony Brook University (SUNY))
Neuromorphic Computation using Quantum-dot Cellular Automata	Enrique Blair (Baylor University)
Securing Data Centers, Handheld Computers, and Networked Sensors Against Viruses and Rootkits	Earle Jennings (QSigma, Inc.)

CONTRIBUTED POSTERS

How to Make a Conscious Machine: Temporal Patterns and Virtual Reality	Alan M. Kadin
Hierarchical Sparse Coding for Multimodal Deep Learning	Edward Kim (Villanova University)
Hybrid Analog-Digital Accelerator for Differential and Algebraic Equations	Yipeng Huang (Columbia University) Alice Mizrahi
Population Coding with Superparamagnetic Tunnel Junctions as Artificial Neurons	(National Institute of Standards and Technology)
Low-Power Image Recognition Challenge	Yung-Hsiang Lu (Purdue University)
Virtualization of Deeply Pipelined Magnetologic	Michael Hall (VelociData, Inc.) Catherine Schuman
Evolutionary Optimization Training for Neuromorphic Systems for Scientific Applications	(Oak Ridge National Laboratory) Garrett Kenyon (Los Alamos National Laboratory and New Mexico Consortium)
Executing Large-Scale Neuromorphic Models on the Trinity Supercomputer	
TrueNorth Implementation of Spiking Cross-correlation Algorithm for Particle Image Velocimetry	Aaron J. Hill (Sandia National Laboratories)
A Hybrid Neuromorphic Architecture	Daniel Burke (Berkeley Neuromorphic)
Neuromorphic Reconfigurable Computing for Underwater Sensing Applications	Jason Gaudette (Naval Undersea Warfare Center)
Cryogenic Microwave Multiprobe System to Characterize Ultra-Fast Low Energy Neuromorphic Circuits	Stephen Russek (National Institute of Standards and Technology)
Adapting Adiabatic Computing to Wireless Energy	Emre Salman (Stony Brook University (SUNY))
Tuning Individual and Mutually Synchronized Spin Hall Nano-oscillators for Associative Memory Neural Networks	Mohammad Zahedinejad (University of Gothenburg)
HTM Sequence Memory for Language Processing	Aidana Irmanova (Nazarbayev University) Naveen Kumar Macha
Stacked Horizontal Nanowire-based Transistor-level 3-D Integration for Beyond CMOS	(University of Missouri, Kansas City)
Efficient Reversible Logic Gates that Supersede the Standard Speed: Fluxon Resonant Scattering with Polarity Changes	Kevin Osborn (University of Maryland, College Park)
From Stochastic to Bit Stream Computing: Accurate Implementation of Arithmetic Circuits and Applications in Neural Networks	Mustafa Altun (Istanbul Technical University)