

# ICRC 2017 Schedule at a Glance

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

## Locations (subject to change):

Salon II-III
Plaza Room
Colonnade Room

Speaker preparation: Attache Room

# Wednesday November 8: Regular and Special Sessions

## Session 1A: Neuromorphic Computing 1 Plaza Room 9:45-11:45 AM Chair: TBD

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

## Session 1B: Beyond CMOS Colonnade Room 9:45-11:45 AM Chair: TBD

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

## Session 2A: Neuromorphic Computing 2 Plaza Room 2:00-4:00 PM Chair: TBD

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

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

## Session 3A: Algorithms and Applications Plaza Room 4:15-6:15 PM Chair: TBD

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

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

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

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

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

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

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

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

## Session 6A: Optical Computing Plaza Room 4:15-6:25 PM Chair: TBD

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

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