

# 2018 DTRA/AFOSR Radiation Damage Effects in Electronics and MEMS

Dr. Kenneth Goretta | May 30 – Jun 1, 2018 | Arlington, VA

Basic Research Innovation and Collaboration Center (BRICC)

4100 North Fairfax Drive, Suite 450

Arlington, VA 22203

Agenda Day 1 | May 30, 2018

07:30	Registration	
07:55	Welcome and BRICC Logistics	AFOSR/BRICC
08:00	Opening Remarks	TBD (DTRA)
08:30	Radiation Effects of Brain Inspired Computing Systems	Iyer, Subramanian (UC Los Angeles)
09:00	Characterizing and Modeling Radiation Effects in Neuromorphic Computing Paradigm	Barnaby, Hugh (Arizona State Univ.)
09:30	Impact of Radiation on Spatio-Temporal Pattern Recognition in Memristor-Based Neuromorphic Circuits	Cantley, Kurtis (Boise State University)
10:00	Break	
10:30	Characterizing Intrinsic and Extrinsic Radiation Effects in Oxide RRAM Devices	Yu, Shimeng (Arizona State Univ.)
11:00	Radiation Characterization of STT-RAM Devices	Bagherzadeh, Nader (UC Irvine)
11:30	Radiation Effects in N-Face and Nonpolar m-Plane III-Nitrides and Heterostructures	Linteur, Azaree (Penn State University)
12:00	Lunch	
13:00	WMD Radiation on Vertical GaN Materials, Junctions, and Interfaces	Weatherford, T.R. (Naval Postgraduate School)
13:30	TEM Investigation on WMD Radiation of Vertical GaN Materials, Junctions, and Interfaces	Specht, Petra (UC Berkeley)
14:00	RER-3D: A Research Center for Radiation Effects Reliability Mechanisms Unique to 3D Integration	Alles, Michael (Vanderbilt University)
14:30	Break	
15:00	Quantifying the Relationship Between Optical and Heavy-Ion-Induced Charge Generation in Si-Based Devices and Circuits	Cressler, John / Ildefonso, Adrian (Georgia Tech)
15:30	Correlation of Laser- and Ion-Induced Effects on Emerging Technologies	Reed, Robert (Vanderbilt University)
16:00	Adjourn	

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Agenda Day 2 | May 31, 2018

07:30	Registration	
07:55	Welcome and BRICC Logistics	AFOSR/BRICC
08:00	The Impact of Radiation Damage on Mechanical and Electrical Properties of MEM/NEM Structures	Alles, Michael (Vanderbilt University)
08:30	Exploration of Damage Mechanisms in MEMS Based Memory and Logic Devices	Alphenaar, Bruce (University of Louisville)
09:00	Basic Science of Radiation Effects in Ferroelectric Multi-Functional MEMS/NEMS	Bassiri-Gharb, Nazanin (Georgia Tech)
09:30	Radiation Effects in Nanoscale Electromechanical Logic Devices and Pathways Toward Robust Computing in Extreme Environment	Feng, Philip (Case Western Reserve University)
10:00	Break	
10:30	Radiation Survivability of MEMS Microelectronic Circuits with Carbon Nanotube Field Emitters	Amsden, Jason (Duke University)
11:00	Understanding Radiation Damage Mechanisms in MEMS/NEMS through Combined Optomechanical Interrogation and Micro-Analysis	Hu, Juejun (MIT)
11:30	Physics of Failure and Radiation Effects in Emerging Electronic Materials and Devices in Space Applications	Schrimpf, Ron (Vanderbilt University)
12:00	Lunch	
13:00	In-situ Microscopy for Probing Microstructure and Reliability of Electronic Materials and Devices	Haque, Aman (Penn State University)
13:30	A Novel Approach to Study Radiation Effect on Two Dimensional Layered Materials	Das, Saptarshi and Choi, Sukwon (Penn State University)
14:00	Spin-Polarized Silicon Photonic and Electronic Interconnects	Sih, Vanessa (University of Michigan)
14:30	Break	
15:00	A New Approach to Develop Atomic Scale Understanding of Radiation Effects in Emerging Nanoscale Memory and Logic Materials and Devices	Lenahan, Patrick (Penn State University)

15:30	Analysis of Radiation-Induced Changes in Robotic Materials, Components, and Subsystems	Witulski, Arthur (Vanderbilt University)
16:00	Adjourn	

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Agenda Day 3 | June 1, 2018

07:30	Registration	
07:55	Welcome and BRICC Logistics	AFOSR/BRICC
08:00	Radiation Effects in Two-Dimensional Material/High-K Dielectric Interfaces	Koester, Steven (University of Minnesota)
08:30	Radiation Effects in Vertical 2D Heterostructure Devices Formed Using Synthesized Materials	Vogel, Eric (Georgia Tech)
09:00	Radiation Effects in III-V MOSFETs for Sub-10 nm CMOS	del Alamo, Jesus (MIT)
09:30	Scaled InGaAs Nano-MOSFET Advanced Radiation Hardness Tests (SMART)	Ye, Peide (Purdue University)
10:00	Break	
10:30	Basic Single-Event and Total-Ionizing Dose Mechanisms in Ge/InGaAs-based CMOS Transistors with ALD High-k Dielectric	Saraswat, Krishna (Stanford University)
11:00	Basic Single-Event and Total-Ionizing Dose Mechanisms in Antimony (Sb)-Based CMOS Transistors with High-K Dielectric	Datta, Suman (University of Notre Dame)
11:30	Radiation Effects in Ultra-Wide Bandgap AlN and Diamond Schottky Diodes	Zhao, Yuji (Arizona State University)
12:00	Lunch	
13:00	Radiation Effects Research on Two-dimensional Transport in Diamond-based Semiconductor Structures	Christou, Aristos (University of Maryland)
13:30	Exploration of Radiation Effects in Beta-Gallium Oxide Materials and Devices	Ringel, Steven (Ohio State University)
14:00	Fundamental Studies and Modeling of Radiation Effects in $\beta$ -Ga <sub>2</sub> O <sub>3</sub>	Pearson, Stephen (University of Florida)