WORKSHOP

Putting the Rad in Radiation Effects

2023 ERI SUMMIT

PROGRAM MANAGER(S): Dr. Todd Bauer, MTO

DATE: Thursday, August 24, 2023	**TIME:** 8:30am-3:30pm
ROOM NAME: 512 Willapa – 5th Floor	

DESCRIPTION

The effects of ionizing radiation in microelectronics have long been a problem in space vehicles which don't have the protection of earth's atmosphere. However, increasing reliance on microelectronics in our day-to-day lives has made radiation effects in terrestrial systems a very real concern. Server farms, life safety systems, and autonomous vehicles are all vulnerable to soft errors and functional interrupts that are attributable to ionizing radiation from thermal neutrons and stray cosmic rays that penetrate the atmosphere. In this workshop we provide high level overviews of the impact of radiation on hardware and algorithms in space and terrestrial environments, and how those impacts are mitigated.

AGENDA

8:30am-8:35am	Workshop Introduction Todd Bauer / MTO PM / DARPA
8:35am-9:00am	[Foundations] Topic: Towards Improving Ionizing Radiation Tolerance of 3-D NAND Flash Memory Biswajit Ray, Associate Professor, Colorado State University
9:00am-9:25am	[Foundations] Topic: Radiation Hardening for Analog and Mixed-Signal Circuits Daniel Loveless, Associate Professor, Indiana University
9:25am-9:50am	[Foundations] Topic: AMD – Radiation Effects & Mitigations in FPGAs and SoCs Pierre Maillard, Sr. Staff Design Engineer / Radiation Effects Team Lead, AMD
Morning Break: 9:45am-10:15am	
10:15am-10:40am	[Granting Autonomy Without Losing Control] Topic: Exploring Resilient Transformer & CNN Architectures for Resource-Constrained Edge Systems Christopher Bennett, Technical Staff, Sandia National Laboratories
10:40am-11:05am	[Compute At The (Very) Edge – Space!] Topic: Developing Electronics for Space Radiation Environments Jesse Mee, Space Electronics Technologies Lead, Air Force Research Laboratory and US Space Force
Lunch Break: 11:30am-12:30pm	
12:30pm-12:55pm	[Compute At The (Very) Edge – Space!] Topic: NASA Electronic Parts and Packaging Program Megan Casey, Radiation Effects Engineer, NASA
12:55pm-1:20pm	[Compute At The (Very) Edge – (Aero)Space?] Topic: Radiation Hardened by Design Advanced Microelectronics Development Manuel Cabanas-Holmen, Microelectronics R&D Manager, Boeing
1:20pm-1:45pm	[May The (Work)Force Be With You] Topic: Building the Next Generation of Radiation-Effects Engineers Mike Alles, Professor, Vanderbilt University
Afternoon Break: 1:45pm-2:15pm	

2:15pm	Panel Discussion – Topic: Radiation Effects and Mitigations in Heterogeneously Integrated Systems Panelists: Daniel Loveless (Indiana University), Bob Kaplar (Sandia National Laboratories), Andreas Olofsson (Zero ASIC), Biswajit Ray (Colorado State University)

Workshops Conclude at 3:30pm