



WORKSHOP: Heterogeneous 3D Microsystems - Opportunities for Photonics: Emerging Computing Concepts and Architectures

PROGRAM MANAGER: Dr. Gordon Keeler, DARPA

DATE: Wednesday, August 19, 2020

TIME: 2:15 PM – 5:45 PM

DESCRIPTION

This workshop will explore both short- and long-term insertion opportunities for integrated photonics technologies in computing systems that leverage innovation under the DARPA Photonics in the Package for Extreme Scalability (PIPES) and Lasers for Universal Microscale Optical Systems (LUMOS) programs. The PIPES program is realizing co-packaged optical interconnect technologies with low energy and latency. The workshop begins by considering new transition opportunities in existing and emerging computing architectures (HPC, AI/ML, data center) for PIPES technologies. The LUMOS program seeks to enhance silicon photonics by incorporating on-chip gain and non-linearities in an accessible, flexible advanced foundry process. Such technologies are likely to enable new photonics applications for information processing systems. The workshop considers the possibilities for the LUMOS technologies for advanced electronic/photonics platforms, neuromorphic optical computing, and quantum information systems.

AGENDA

2:15 PM	Introduction and Workshop Goals Dr. Gordon Keeler, DARPA
2:30 PM	Empowering Extreme Scale Data Analytics Computing with Embedded Silicon Photonics Dr. Keren Bergman, Columbia University, Professor
2:45 PM	Optics for the Myopic Datacenter Mr. Doug Carmean, Microsoft, Architect
3:00 PM	Future Architectures with Photonics Dr. Josh Fryman, Intel, Senior Principal Engineer
3:15 PM	Accelerating AI Systems with Optics Dr. Larry Dennison, NVIDIA, Director of Network Research
3:30 PM	Around the Room – Open Discussion
Afternoon Break: 4:00 PM – 4:15 PM	
4:15 PM	The Next Frontier: Reaching the Level of Human Consciousness with Optically-Enabled Distributed Computing Dr. Vladimir Stojanovic, Ayar Labs, Co-Founder and Chief Architect; University of California, Berkeley, Professor
4:30 PM	Photonic Accelerators for Machine Intelligence Dr. Dirk Englund, Massachusetts Institute of Technology, Professor
4:45 PM	Spike-Based Neuromorphic Photonic Processing Dr. David Rosenbluth, Lockheed Martin, Fellow
5:00 PM	Around the Room – Open Discussion
5:40 PM	Concluding Remarks Dr. Gordon Keeler, DARPA
Virtual Exhibit Hall Office Hours: 5:45 PM – 6:45 PM	

QUESTIONS

Please contact the ERI Summit mailbox for more information at ERI-Summit@darpa.mil.