UNDERSTANDING USER REQUIREMENTS AND BRIDGING TECHNOLOGY GAPS

This meeting will define performance and economic user requirements for applications in datacom, RF/wireless/augmented reality, and sensing, and will feature end user visions for near-term, mid-term and end-of-scaling requirements. The Roadmap technical working group meetings will define roadblocks and potential solutions in each technical area.

Speaker presentations will address the areas of datacom, computing, 5G communication, LiDAR for a broad range of active 3D imaging, biomedical/chemical sensing and IoT networks.

WEDNESDAY, March 20, 2019

8:30  Registration

Session I: Data Center and HPC User Needs

Hyperscale Data Centers; Networks; Switch and Router Scaling

Cost of Ownership, Disaggregation of Architecture and Vertical Integration of Product Development

- Capacity Ramp for the Hyperscale Data Center
  Katharine Schmidtke (Facebook)
- The Changing Role of Photonics Beyond the End of Moore’s Law
  John Shalf (LBL)
- The Future of Computing
  Larry Dennison (NVIDIA)

Break

Requirements and Photonic Solutions for Networks

- Vipul Patel (Cisco)
- Integrated Silicon Photonics in DC Networks
  Daniel Sparacin (Juniper)
- Building the Supply Chain for Integrated Photonics
  Tom Hausken (OSA)
- Wall Street Perspective: the Photonics Industry
  James Kisner (LightCounting Market Research)

Attendee Lunch

MIT Microphotonics Center Board Meeting

Session II: RF and Augmented Reality System Requirements

Ubiquitous RF Photonics, Coherent Detection; Innovations in Optics; Chemical Sensing

Electronic-Photonic System Integration; Components for Real Time 3D Vision and System Applications

- RF Photonics Components and Application Requirements
  Rick Stevens and Michael Hoff (Lockheed Martin)
- Silicon Photonics for Low Cost Coherent LiDAR
  Jonathan Luff, Dazeng Feng and Mehdi Asghari (SiLC)
- Silicon Materials and Structures for 3D Imaging, Eye Tracking, and Augmented Reality
  Mark Brongersma (Stanford)

Break

Session III: PIC Design Innovation Workshop

Commercial EPDA Capability; AIM Academy Design Education; Foundry Design Services

Electronic-Photonic Design Automation: State of the Art

- EPDA Software and Design
  Twan Karthorst (Synopsys)
- Foundry Integration of Automated Design
  Gilles Lamant (Cadence)
- Foundry Design Services: Needs and Gaps
  Kevin McComber (Spark)
Session IV: PIC Research Frontiers
Hardware, Software and Architecture Drivers
Disruptive Advances in Devices, Circuits and System Applications

A Vision for PICs in System Architecture and Functionality
Valdimir Stojanovic (UC Berkeley)

High Capacity Multiwavelength Selective Optical Switches Using AIM Photonics
John E. Bowers, Akhilesh S. P. Khope, Roger Helkey, Adel A.M. Saleh (UCSB)

High Radix Optical Switches for Network Interconnection
Ming Wu (UC Berkley)

Programmable Photonic Circuits
Graham Reed (Southampton U)

6:30 Networking Reception

THURSDAY, March 21, 2019 8am – 4:00pm

8:30 Registration
9:25 Lessons Learned

Session V: PIC Foundry Platforms
Chips; Interposers; Packages; AIM Photonics Institute Update
Implementing a Foundry R, D & M Infrastructure

The AIM Technology Plan: PICs to Interposers to Packages
Doug Coolbaugh (SUNY-Poly)

The New AIM PDK 2.5
Erman Timurdogan (Analog Photonics)

The Rockley PIC Platform
Aaron Zilkie (Rockley)

Session VI: The Future of the Interconnection Hierarchy
Aligning Technical Plans with Technology Projections
Building Dense, High Capacity Systems at Commercially Acceptable Cost

Interconnection Hierarchy 2035 Interim Report: Difficult Challenges and Potential Solutions
Lionel Kimerling (MIT)

Glass Waveguides for Board-Level Optical Interconnects
Alan Evans (Corning)

Grand Challenges for Assembly: E, P and E-P
Dan Evans (Palomar)

Pushing Bandwidth Limits with Copper
Amir Bar-Niv (Aquntia)

Attendee Lunch

Session VII: AIG Workshop
On-Board Photonics; RF Microwave Photonics for 5G; Photonic Sensor Systems
An Application Interest Group is an industry-led, precompetitive collaborative project among industry, academia and government to provide solutions to technology roadblocks. Each project has three phases: i) define system requirements; ii) assess technology gaps; iii) prototype potential solutions.

- Solving the Connector Problem
- Solving the RF Substrate Problem
- Building a Standard Sensor Platform

Session VIII: AIG and TWG Breakouts
Integrated Photonic Systems Roadmap- International TWGs and AIGs meet to ratify consensus on 2019 Roadmap chapters. And to propose a solution for an IPSR-I challenge problem: Standards and Process Capability

Technology Challenge Problems: RF Microwave Photonics for 5G; Photonic Sensor System. Technology Working Groups: Materials, Monolithic Integration, Design, Test, Assembly, Packaging, Optical I/O.

4:00 Lessons Learned
4:10 Adjourn