



## IPSR-INTERNATIONAL 2019 FALL MEETING

October 10-11, 2019

Cambridge, Massachusetts • Marriott Hotel

# BREAKING THROUGH THE COMMERCIAL BARRIERS

### PREVIEW OF THE 2020 INTERNATIONAL INTEGRATED PHOTONIC SYSTEMS ROADMAP

The 2019 Fall Meeting will assess the commercial ramp of electronic-photonic systems and define the application-specific roadblocks and their potential solutions. *Each Session will feature four levels of perspective: i) CTO Vision, ii) Engineering Implementation, iii) Research Solutions and iv) Panel consensus on market demands, gaps, technological barriers, and timeframes for key engineering milestones.*

Thursday, October 10, 2019

Morning Sessions

(2<sup>nd</sup> Floor, Salon IV)

**8:00a Registration**

**8:30 Meeting Success Factors:** Lionel Kimerling, Professor, MIT

**8:40 Welcome:** Rich Gryzbowski, MACOM, Chair, Microphotonics Center Industry Consortium

### Session I System Requirements: Design, Process and Architecture Integration

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

**Session Chair:** Paul Juodawlkis, Assistant Group Leader, MIT Lincoln Laboratory

**8:45 Keynote:** Uri Cummings, Chief Technologist, Intel Connectivity and Data Center Group  
*Vision for the pervasive deployment of electronic-photonic integrated systems in communication, computing, imaging and learning*

**9:15 Engineering Keynote:** Gordon Keeler, Program Manager, MTO DARPA  
*Optical microsystems at DARPA: applications driving photonics technology development*

**9:45 Panel:** Ronald Luijten, Senior Technical Project Lead, IBM Zurich, Chair  
*Disruptions in the path of repartitioned electronic-photonic information processing*

**10:15 Break** (2<sup>nd</sup> Floor Foyer)

### Session II Application Specific Platforms: Performance

*Niche vs. Commodity: application performance scaling and platform diversity*

**Session Chair:** Mark Earnshaw, Group Leader, Nokia Bell Labs

**10:30 Vision Keynote:** Martin Zirngibl, CTO, Finisar  
*What Does the Cross-Over from Pluggable Modules to Co-Packaged Optics Mean for Industry?*

**11:00 Engineering Keynote:** Ronald Luijten  
*The MicroDataCenter solution for architecture and packaging at the system level*

**11:30 Engineering Keynote:** Dennis Prather, Professor, U Delaware  
*Microwave/millimeter-wave sensing and communication: status, technology needs, and timeline*

**12:00 Panel:** Alexis Black Bjorlin, Senior VP and General Manager, Broadcom, Chair  
*Will scaling cost and manufacturing drive all solutions to silicon?*

**12:30 General Session Lunch** (2<sup>nd</sup> Floor Foyer, Salons V & VI)

**MIT Microphotonics Center Board Meeting** (3<sup>rd</sup> Floor, Discovery Conference Room)

### Become a Member of the MIT Microphotonics Center

The MIT Microphotonics Center is a Consortium of scientists, engineers, and strategists from academia and industry, whose core mission is the creation of new materials, structures and architectures to enable the evolution of photonics from single, discrete devices to integrated photonic systems, where such systems facilitate industry and consumer demands within economic and technical boundaries.

Thursday, October 10, 2019

Afternoon Sessions

(2<sup>nd</sup> Floor, Salon IV)

### Session III Focus on E-PIC Packaging

*Building the necessary electronic-photonic system synergy*

Session Chair: Dan Evans, CTO, Palomar

- 2:00 **Vision Keynote:** Terry Smith, Senior Staff Scientist (r.), 3M retired; Tom Marrapode, Director of Advanced Technology, Molex; Tom Brown, Professor, U Rochester; Peter O'Brien, Tyndall; Sean Foley, AFL; Grace O'Malley, iNEMI  
*Vision for On-Board Optical Interconnection: system requirements, industry survey results, consortium demo specifications*
- 2:30 **Engineering Keynote:** Liron Gantz, Senior Staff Engineer, Mellanox  
*Vision for Co-packaging and optical integration*
- 3:00 **Engineering Keynote:** Ed White, AVP, AIM-TAP  
*Requirements and successes for ramping packaging foundry capability*
- 3:20 **Panel:** Dick Otte, President, Promex Industries, Chair  
*Low cost with seamless tool and architecture compatibility for System-in-Package*
- 3:50 **Break** (2<sup>nd</sup> Floor Foyer)

### Session IV Technology TWG Executive Summary Reports

*Key Points and Grand Challenges*

Session Chair: Bill Bottoms, CEO, 3MTS

- 4:00 **Electronic-Photonic Design Automation**  
Twan Korthorst, Director of Photonic Solutions, Synopsys
- 4:10 **Silicon**  
Ajey Jacob, Director for Photonic R&D, GLOBALFOUNDRIES
- 4:20 **Indium Phosphide**  
Gloria Hoefler, Director of Advanced Development, Infinera
- 4:30 **Electronic-Photonic Packaging**  
Bill Bottoms
- 4:40 **Electronic-Photonic Assembly**  
Dick Otte and Dan Evans, CTO, Palomar
- 4:50 **Electronic-Photonic Test**  
Tom Brown
- 5:00 **Interconnects**  
Terry Smith and John MacWilliams, Principal Consultant, IPSR-I
- 5:10 **Panel:** Rich Gryzbowski, General Manager, MACOM, Chair  
*Value expectations for the IPSR-I*
- 5:40p **Networking Reception** (2<sup>nd</sup> Floor Foyer, Salons V & VI)

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Friday, October 11, 2019  
Morning Sessions  
(2<sup>nd</sup> Floor, Salon IV)

- 8:00a **\*On-Board Optical Interconnection AIG Planning Session** (3<sup>rd</sup> Floor, Endeavor Conference Room) \*by Invitation  
8:30a **Registration**  
8:50 **Lessons Learned: Lionel Kimerling, MIT**

### Session V The Pb/s Bandwidth Density Frontier

*High capacity I/O at constant cost, energy and thermal load*

**Session Chair: Tom Hausken, Senior Advisor, Engineering and Applications, OSA**

- 9:00 **Vision Keynote: Near Margalit, CTO, Broadcom Optical Systems Division**  
*vision for electronic-photonic integrated systems: data links, switches, and protocols*
- 9:30 **Engineering Keynote: Chris Doerr, VP of Advanced Development, Acacia Communications**  
*technology and cost interplay in bandwidth scaling*
- 10:00 **Engineering Keynote: Etshushi Yamazaki, Senior Research Engineer, NTT**  
*Optical transmission technologies scaling for growing capacity demand*
- 10:30 **Engineering Keynote: Milos Popovic, Associate Professor, Boston University**  
*bandwidth monolithic e-p integration for WDM MUX/DMUX*
- 11:00 **Panel: Tremont Miao, Product Marketing Director, ADI (r.), Chair**  
*variables, interactions and system optimization for scaling to Eb/s I/O*
- 11:30 **General Session Lunch** (2<sup>nd</sup> Floor Foyer, Salons V & VI)  
**IPSR-I TWG Leaders Meeting** (3<sup>rd</sup> Floor, Discovery Conference Room)

Afternoon Sessions  
(2<sup>nd</sup> Floor, Salon IV)

### Session VI Manufacturing: Cost and PIC Foundry Capabilities

*Tools, time, utilization and yield*

**Session Chairs: Ajey Jacob, CTO, GLOBALFOUNDRIES and Atul Srivastava, CTO, NEL America**

- 1:00 **Vision Keynote: Peter De Dobbelaere, Director of Technology Development, Cisco Systems**  
*Integrated Optics vs Incumbent Technologies*
- 1:30 **Engineering Keynote: Michael Liehr, CEO, AIM Photonics Institute**  
*Vision for the PIC R&D foundry from an historical IC Fab perspective*
- 2:00 **Business Keynote: James Kisner, Principal Analyst, LightCounting**  
*Vision from Wall Street: industry status and forecast*
- 2:20 **Break**
- 2:40 **Vision Keynote: Twan Korthorst, Director of Photonic Solutions, Synopsys**  
*Past, Current and Future of PIC Design for Manufacturing: The importance of automation, design re-use and verification for integrated photonics product development*
- 3:10 **Engineering Keynote: Kevin Williams, Professor, TUIE**  
*European activities in PIC technology: manufacturing pilot lines for indium phosphide PICs*
- 3:40 **Panel: Carol De Vries, PhotonDelta, Program Manager, Chair**  
*Incrementing product performance at commercially acceptable intervals*  
*System parameters for supporting R&D and design while ramping manufacturing volume*
- 4:10 **Lessons Learned: Lionel Kimerling, MIT**  
4:30p **Adjourned**

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