



AIM PHOTONICS FALL 2017 MEETING

October 10th - 12th 2017

NANOFAB South Auditorium, SUNY-Poly, Albany, NY

BUILDING AN INDUSTRY: PART III REQUIREMENTS, GAPS AND SUPPLY CHAIN TIMELINES

AIM Photonics Institute • IPSR International • The MIT Microphotonics Center
Heterogeneous Integration Roadmap • SEMI Northeast

TUESDAY, OCTOBER 10th

8:00a **Registration and Light Breakfast** (NFS Rotunda)

8:20a **Welcome:** Douglas Coolbaugh, SUNY-Poly and Lionel C. Kimerling, MIT

SESSION I: INFRASTRUCTURE

A snapshot of the PIC manufacturing infrastructure: technology is a high cost R&D solution until an end-to-end supply chain is established.

Session Chair: Rich Grzybowski, Director of Research & Development, MACOM

8:30a **Keynote: GlobalFoundries 300mm Silicon Photonics Platforms**

Ken Giewont, GlobalFoundries Fellow

9:00a **Keynote: Prototyping PIC Packaging Solutions**

Peter O'Brien, Tyndall National Institute

9:30a **Keynote: iNEMI-IPSR Board-Level Optical Interconnect Project Overview and Status Update** Tom Marrapode, Molex

10:00a **Break** (NFS Rotunda)

10:15a **Keynote: Moving to the Mainstream: Design Enablement for Photonic Systems** Ian Dennison, Cadence

10:45a **Keynote: World Technology Roadmap Forum 2017**
Kevin Williams, TU/Eindhoven

SESSION II: AIM PHOTONICS TODAY

An introduction to user participation: the AIM manufacturing infrastructure offers an automated design gateway to world class semiconductor manufacturing.

Session Chair: Frank Tolic, AIM Photonics

11:20a **AIM Photonics MCE Updates:** Doug Coolbaugh, COO, AIM Photonics

11:30a **The AIM PDK & MPW: Rules of Engagement and Key Performance Data:**
Brett Attaway, Director of Design Enablement, AIM Photonics

11:50a **AIM Photonics TAP Update:** Ed White, Corporate Outreach,
SUNY Polytechnic Institute; Chairman, National Photonics Initiative

12:00p **AIM Photonics KTMA Update:** Michael Watts, CTO, AIM Photonics

12:10p **Attendee Lunch (Zen Building)**

**IPSR International and TWG Leaders Meeting and Lunch
(President's Boardroom, 4th Floor of the NANOFAB East Building)**



1:30p **AIM Photonics 300mm Fab Tour:** Frank Tolic, CMO, AIM Photonics

SESSION III: APPLICATION SPECIFIC CASE STUDIES:

Report from the AIM Academy Summer School

Case Studies from the AIM Academy Summer School Design Projects: these teams are recruiting members for establishing Application Interest Groups under IPSR International.

Session Chair: Yi Qian, MRSI Systems

2:20p **Introduction:** Sajan Saini, AIM Academy

2:30p **Datacom: A Scalable Transceiver Platform for On-Board Datacom**

Team Representative: Dingbo Chen, Finisar

Moderator: Madeleine Glick, AIM Academy

2:45p **LIDAR: A Higher Definition AR Camera System**

Team Representative, Glen Koste, GE Global Research

Moderator: Kazumi Wada, AIM Academy

3:00p **Analog RF: A Compact Base Station for 5Gbit/s Wireless**

Team Representative: Jeff Vollin and Benn Gleason, Raytheon

Moderator: Sajan Saini, AIM Academy

3:15p **Sensing: An Integrated Photonic CH₄ Sensor for Pipeline Networks**

Moderator: Anu Agarwal, AIM Academy

SESSION IV: IPSR INTERNATIONAL TWG BREAKOUTS

Breakout Meetings: TWG volunteers will be organized and prepared before the meeting by the respective leaders listed below. The team findings will contribute to the IPSR International 2017 update. (South Auditorium, South Rotunda, CESTM Rotunda, and NFC Boardroom)

Session Chair: Bill Bottoms, 3MTS

3:30p **Photonic Packaging**

Peter O'Brien, Bill Bottoms

(CESTM Rotunda)

Monolithic Integration

Ajey Jacob, Lionel Kimerling, Kevin Williams

(NanoFab South Auditorium)

Electronic-Photonic Design Automation

Brett Attaway, Twan Korthorst

(NanoFab Central Boardroom)

Assembly

Richard Otte, Yi Qian

(NanoFab South Rotunda)

System Testing & Metrics

Dave Armstrong

(NanoFab South Rotunda)

Interconnect Substrates & Connectors

Terry Smith, John MacWilliams

(NanoFab South Rotunda)

Photonic Sensors

Ben Miller, Anu Agarwal

(CESTM Rotunda)

5:30-8:00p Networking Reception (Zen Building)



WEDNESDAY, OCTOBER 11th

- 8:00a **Registration and Light Breakfast** (NFS Rotunda)
8:30a **Lessons Learned:** Lionel Kimerling, MIT and AIM
8:40a **Welcome to AIM Photonics Institute:** Michael Liehr, CEO, AIM Photonics

SESSION V: INTERCONNECT AND INTERPOSER SOLUTIONS

The Interposer is the near term solution for light source and ASIC integration with PICs and for board mount solutions. The purpose of an interposer is i) to spread a connection to a wider pitch, ii) to reroute a connection to a different connection, iii) to enhanced reliability and assure successful assembly.

Session Chair: Bob Pfahl, Director, IPSR International

- 9:00a **Optical Interposers for Board-Level Optical Interconnect**
Terry Smith, 3M
- 9:20a **Silicon Interposers**
Doug Coolbaugh, AIM Photonics
- 9:40a **Glass: Versatile Material for Optoelectronic Packaging**
Alan Evans, Corning
- 10:00a **An Optical Interconnect Demonstrator: an HDP project**
Jack Fisher, HDP User Group International
- 10:20a **Break** (NFS Rotunda)
- 10:40a **Keynote: High-Throughput Photonic Packaging**
Tymon Barwicz, IBM
- 11:10a **Panel Discussion: Optimizing Technology and Market Synchronization**

12:00p Attendee Lunch (Zen Building)

SESSION VI: IPSR INTERNATIONAL TWG REPORT-BACK

Session Chair: Bill Bottoms, 3MTS

- 1:30p **Photonic Sensors:** Ben Miller, University of Rochester and Anu Agarwal, MIT
- 1:45p **Photonic Packaging:** Bill Bottoms, 3MTS
- 2:00p **EPDA:** Brett Attaway, AIM Photonics
- 2:15p **Experiential Learning Tools for Integrated Photonics Design:**
Erik Verlage, AIM Photonics Academy
- 2:30p **Assembly:** Dick Otte, Promex
- 2:45p **Test:** Dave Armstong, Advantest
- 3:00p **Interconnect:** Terry Smith, 3M
- 3:15p **Monolithic Integration:** Ajey Jacob, GlobalFoundries



SESSION VII: HETEROGENEOUS INTEGRATION ROADMAP I

Heterogeneous Integration refers to the integration of separately manufactured components into a higher-level assembly (SiP) that, in the aggregate, provides enhanced functionality and improved operating characteristics. The HIR plots the roadmap for high density component integration at the chip, package and board level for electronic and photonic systems.

Session Chair: William Chen, Aseus and Bill Bottoms, 3MTS

- 3:30p **Introduction to the HIR:** William Chen, Aseus
- 4:00p **HPC and Data Centers:** Kanad Ghose, SUNY Binghamton and HIR
- 4:30p **A New Paradigm of Plasmonic/Photonic/Electronic Heterogeneous Integration:** Amr Helmy, University of Toronto and HIR

THURSDAY, OCTOBER 12th

8:00a **Registration and Light Breakfast** (NFS Rotunda)

SESSION VIII: HETEROGENEOUS INTEGRATION ROADMAP II

These presentations provide background for addressing the challenges of future market requirements with the integration of photonics, electronics and plasmonics in system level products.

Session Chair: Bill Bottoms, 3MTS

- 8:00a **Packaging Challenges and the HIR:** Bill Bottoms
- 8:30a **Breakout/Panel Discussions on Heterogeneous Integration**
Scaling Challenges and Potential Solutions, panelists:
 - Test Challenges for Heterogeneous Integrated Packages**
Dave Armstrong, Advantest and HIR
 - Light Sources, Markets and Monolithic Integration**
Wei Yu and Lionel Kimerling, AIM, MIT
 - Plasmonics in Electronic Photonic Systems**
Amr Helmy, University of Toronto and HIR
- 9:50a **Adjourn**



SEMI NORTHEAST CHAPTER MEETING

Integrated Photonics – Driving Next Generation Semiconductor Business Opportunities

(Separate Registration)

- 10:00a **Registration**
- 10:30a **Christina Chu**, Welcome and Introductions, Director, Business Development, TEL / Nexx Systems; SEMI Northeast Committee Chair
- Frank Tolic**, Moderator, Chief Marketing Officer, AIM Photonics; SEMI Northeast Committee
- 10:35a **Ed White**, Corporate Outreach, SUNY Polytechnic Institute; Chairman, National Photonics Initiative, *AIM Photonics – Standing-up the AIM Test, Assembly and Optical Packaging Facility*
- Michael Watts**, President & CEO, Analog Photonics; Associate Professor, EECS, Massachusetts Institute of Technology
- 11:35a **RoundTable Discussion**
- Invited Panelists: GE, Global Foundries, Intel, TEL, Veeco
- 12:30p **Networking Luncheon**
- 1:30p **Tour of CNSE Facilities**, contact mkindling@semi.org to participate

UPCOMING AIM ROADMAP MEETINGS

Spring 2018 IPSR Meeting: March 26-27, MIT Media Lab

Fall 2018 IPSR Meeting: November 29-30, MIT Samberg Meeting Center

Spring 2019 IPSR Meeting: March 26-27, MIT Samberg Meeting Center