



New York State Photonics Board of Officers

Public Meeting

Future Site of the Testing Packaging Assembly (TAP) Facility:
ON Semiconductor @ Eastman Business Park
March 3, 2017



American Institute for Manufacturing Integrated Photonics

NY Photonics Board Update and 2017/2018 Budget Request

March 3, 2017



Friday, March 03, 2017

AIM Photonics will be Exhibiting at OFC 2017

(Like SEMICON West for Optics)

Multiple staff presenting at various sessions & workshops

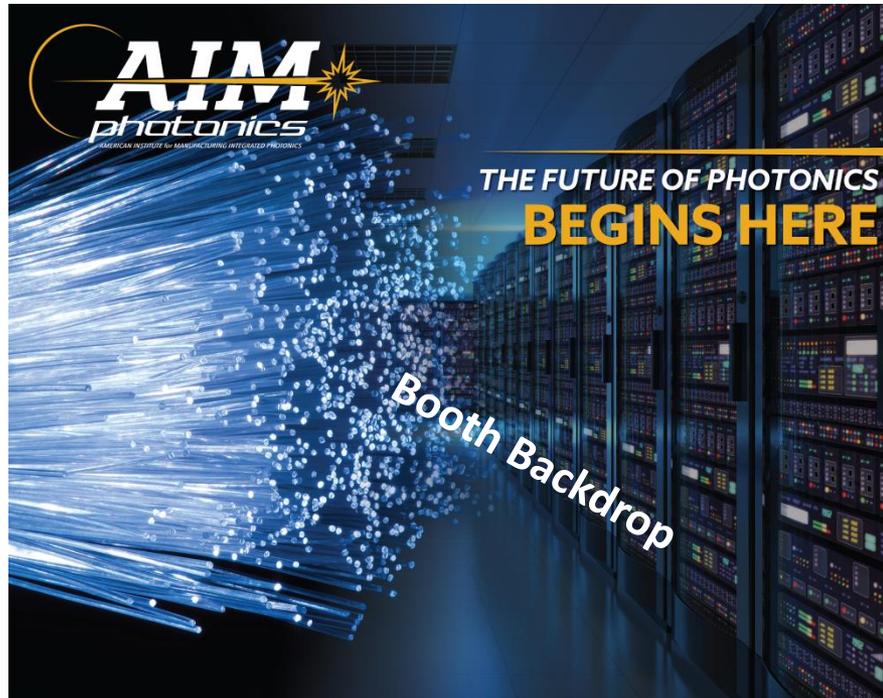
AIM hosting a 3hr long technology summit highlighting

- MPW/PDK Program
- TAP
- Current Projects



Leadership Council Meeting on last day

(Video & Social media week long on New Website and New YouTube channel)



AIM Photonics - OFC 2017

OFC

The future of optical networking and communications is here.

AIM Photonics representatives and members will participate in The Optical Fiber Communication Conference and Exhibition (OFC); the largest global conference and exhibition for optical communications and networking professionals.

[More info](#)

AIM Photonics Technology Summit

OFC 2017

Wednesday, March 22, 15:00-18:00

Room 503 - Los Angeles Convention Center

Session organized by AIM Photonics

Join AIM Photonics for an evening of integrated silicon photonics discussion and updates from AIM Photonics Executives, Members, and Partners. The Summit will include latest on PDK/MPW vehicles and real time studies, in addition to most recent updates on the brand new state-of-the-art Test, Assembly, and Packaging facility (TAP), including latest projects and available programs. The session will close with highlights of some of AIM Photonics ground breaking technical projects. At the end will be a drawing for a special AIM Photonics prize. Don't miss out.

SESSION 1: PDK/MPW

- **Technology Details:** Full, Passive, Interposer, and MPW access
- **PDK Overview:** Releases, component library, docs, DRC, EPDA support
- **PDK library details:** Review components, use, specs, future additions

SESSION 2: TAP

- **TAP Road-map:** Chip package, system, and connector solutions
- **Facility status update:** Tooling and infrastructure timeline

Precision OT Collaboration

“Precision plans to utilize AIM infrastructure to further push the envelope of our technical offerings. We believe that by working with AIM Photonics and its partners we will be able to significantly advance our transceiver product line and offer adjacent components to meet our customer’s needs. Our partnership with AIM Photonics will ultimately provide better services, systems, and cutting edge technologies for our end users.”

— Bryce Tenant, CTO, Precision Optical Transceivers

Coventor Membership



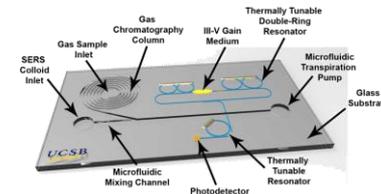
Coventor's CTO Dr. David Fried (left) and Michael Liehr, CEO of AIM and Executive Vice President of Technology and Innovation for SUNY Polytechnic Institute (right)

Sensor Project

The Sensors of Tomorrow

AIM Photonics, University of Rochester, and Department of Defense Partnership to Create the “Eyes and Ears” for Photonics Technologies

A new Defense Department project representing a key component of the American Institute for Manufacturing Integrated Photonics (AIM Photonics) initiative will help researchers develop sensors that can be employed by photonics-based systems for use in a wide range of applications, such as environmental monitoring, disease diagnosis, detection of chemical and biological weapons, and to ensure food safety.



\$900,000 US Department of Defense (DoD) project, along with an additional \$1.66 million in matching funds from AIM Photonics industrial members

NEXT MONTH: GE, IBM, Mentor Graphics, Tier 1 Membership Announcement.
(Soon 1 other -- 4 new Tier 1 since New Year!)



“UCSB’s expertise in epitaxial growth and in designing quantum dot lasers is key in developing next-generation integrated photonic chips, and we have made significant strides recently with high-quality lasers grown on on-axis (100) silicon without a germanium layer.”

John Bowers
AIM Photonics Deputy CEO



THE WORLD’S MOST ADVANCED AIRCRAFTS REQUIRE STATE-OF-THE-ART ELECTRONICS

AIM Photonics is powering the next generation of avionic electronics by making them lighter and faster with its Advanced Integrated Silicon Photonics Chips.

WWW.AIMPHOTONICS.COM



**SPACE TECHNOLOGY RESEARCH GRANTS PROGRAM,
EARLY CAREER FACULTY APPENDIX**



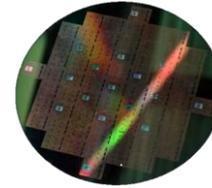
CALL FOR PROPOSAL

“Development of a Prototype Focal Plane Array (FPA) Cryogenic Integrated Photonic Datalink”

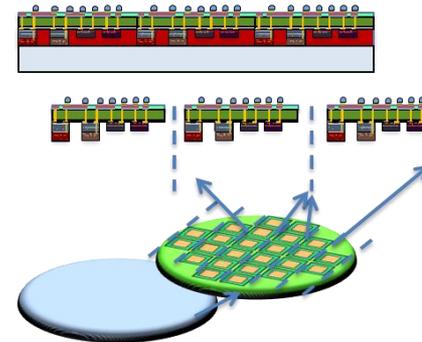
“When you consider the impact these sensors will have in immediately diagnosing illness, rapidly detecting foodborne pathogens, instantly assessing water and air quality, and ensuring the security of our citizens, you then realize the significance of AIM Photonics and how the technology we are developing is nothing short of a revolution,”

-- John Maggiore, New York State Photonics Board of Officers Chairman

1. *Wafer-level* active photonics chips
 - Wafer processing of optical elements
 - Laser bonding

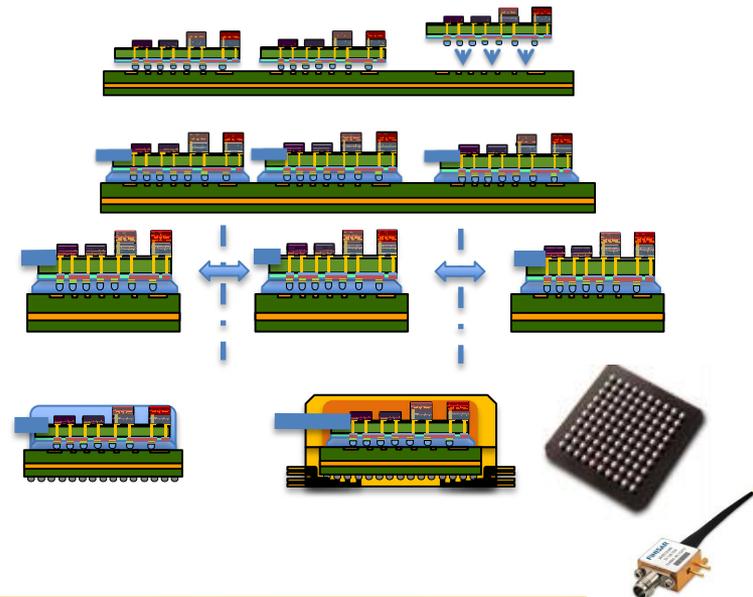


2. *Wafer-scale* photonics packaging
 - First-level interposer metallization
 - De-bond and dicing of wafers



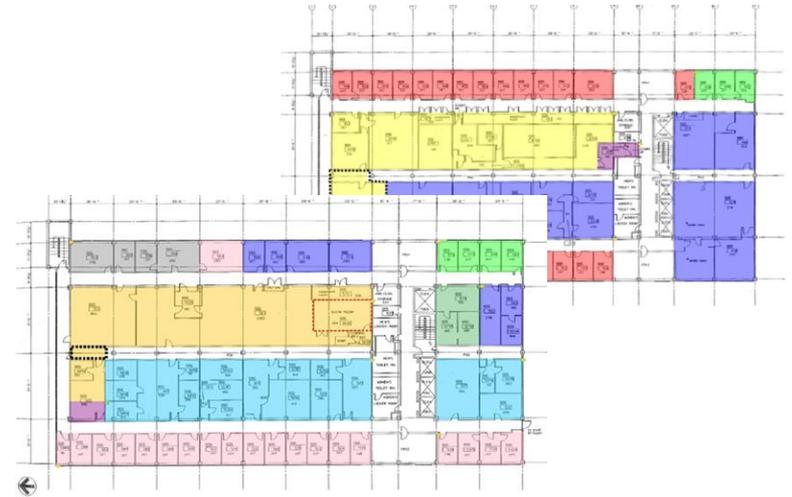
70-80% of the cost of a Si-photonics system is in the package

3. *Chip-scale* test, assembly and packaging
 - Laminate and fiber attach
 - Manufacturing technology development and hardware support



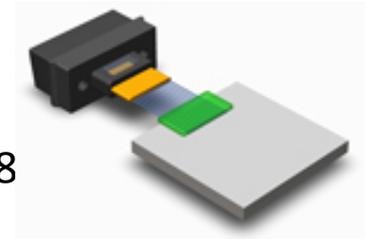
■ Facility

- Lease Term Sheet - Complete
- Engineering layout and RFP prep – In Process
- Renovations managed by ON Semi
- Estimated availability
 - Lab 2Q2017
 - Cleanroom 4Q2017



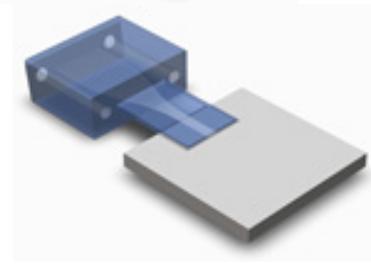
■ Technology Transfer

- IBM License Agreement - Complete
- IBM Tech transfer (Bromont to Rochester) - underway
 - Technical Workshop complete – 2 March 2017
 - ON Site Training - later this year
- Chip Scale Tech transfer (Albany to Rochester) - 4Q2017 – 1Q2018



■ Hiring

- Fiber Attach Engineer
- 3D Packaging Technology Engineer
- Optical Test/Electrical Test Engineer:
- Metrology Engineer
- General Packaging Engineer
- Plus... RIT/UR and SUNY Poly assignees and support



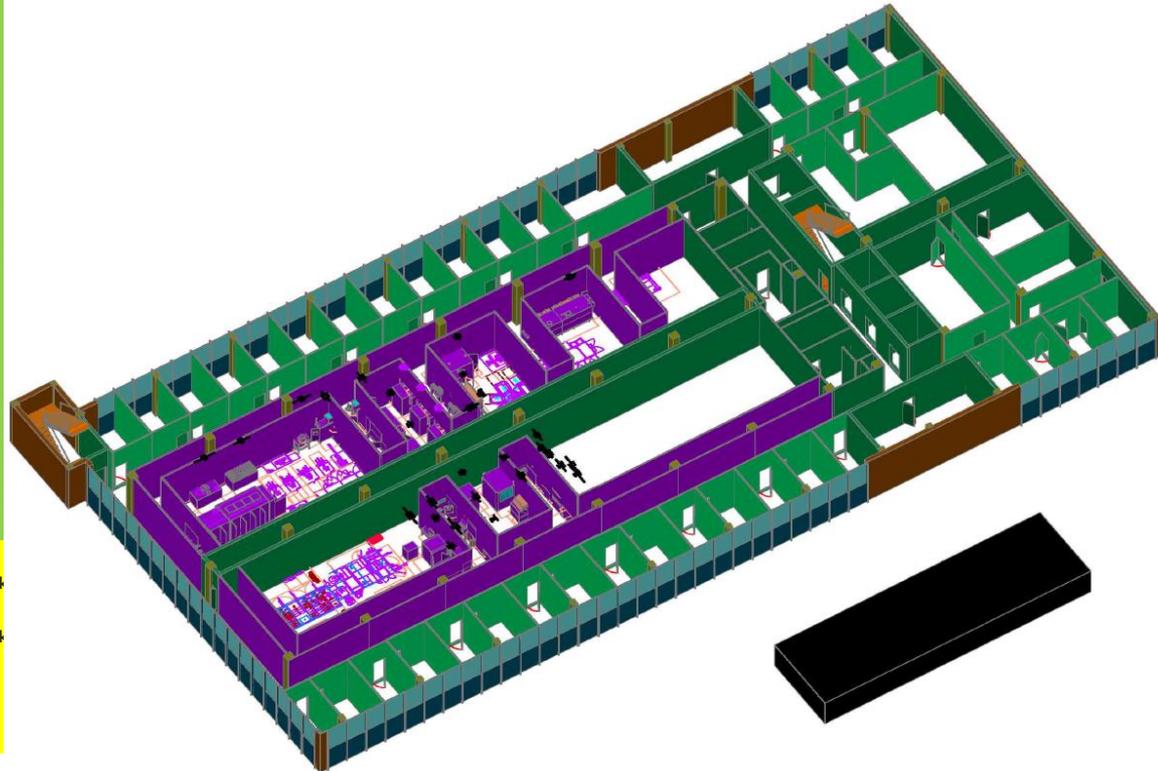
Name

Laser Die Bonder
 E/O Tester
 Wafer Prober
 Wafer Grinder
 Active Fiber Attach
 Aqueous Board Cleaner
 Fiber Cleavers - Laser
 Cure Oven
 Confocal Scanning Acoustic Microscope
 Digital Microscope
 High accuracy Comparator
 Optical Backscatter Reflectometer
 Reflectance Spectrometer
 Stereo Microscope
 All-in-One Fiber Preparation and Fusion Splicing Station
 Optical Preamplifier
 Optical Booster Amplifier
 Burst Mode Amplifier
 Semiconductor Device Parameter Analyzer
 Multiport optical power meter
 Lightwave Multimeter
 Optical fiber switches
 Polarization Scrambler
 Polarization Stabilizer / Controller
 Polarization Synthesizer/Analyzer
 Parallel BERT
 Serial BERT
 Digital Communications Analyzer
 High Definition Oscilloscope
 Arbitrary Waveform Generator
 Electrical (RF) Signal Analyzer
 SMT Tools
 Bake Oven
 Ball Attach Tool
 Coat/Develop Track
 Litho Exposure Tool
 Overlay Metrology
 Thick Photoresist Stripper
 Physical Vapor Deposition (PVD or Sputtering)
 Pick & Place Die Handler

Lead Time to Ship

29 weeks
 24 weeks
 18 weeks
 24 weeks
 26 weeks
 8 - 10 weeks
 6-8 weeks
 8 weeks
 3-5 weeks
 5 weeks
 In Stock
 8 weeks
 10 weeks
 4 weeks
 4-6 weeks
 4 weeks
 4 weeks
 6-8weeks
 6-8 weeks
 6-8 weeks
 6-8 weeks
 6-8 weeks
 6-8 weeks
 5 weeks
 5 weeks
 5 weeks
 8 weeks
 6-8 weeks
 9 weeks
 6-8 weeks
 6-8 weeks
 6-8 weeks
 6-8 weeks
 14 weeks
 18 weeks
 16-20 week
 26 weeks
 36-39 week
 19 weeks
 20 weeks
 24 weeks
 14 weeks

- Evaluation of RFP's for 110 Tools – In Process
- Supplier negotiations – In Process
- Purchase Order release anticipated to begin in March



- The 2016/2017 budget allowed to establish the generic base facility and equipment set for the TAP facility

- *Out of scope for 2016:*
 - *Full equipment set for wafer scale packaging (2016 is partial)*
 - *Floor control system (line logistics and analysis)*
 - *Member-driven capability adds*
 - *Wafer-level capacity and cycle time*

- The 2017 budget request adds the above

- The proposed NYS budget, in support of AIM Photonics programs located in NYS, is **\$81 million**
- The proposed budget covers the period April 1, 2017 through March 31, 2018
- The 2017-2018 proposed budget is the second tranche of NYS expenditures. Including this proposed budget, the NYS expenditures, through March 31, 2018 will be:

\$106 Million April 1, 2016 – March 31, 2017

\$ 81 Million April 1, 2017 – March 31, 2018

\$187 Million

- The summary of the 2017 – 2018 expenditures is:
 - \$71 Million for Capital Tools and Equipment
 - \$10 Million for Operating and Maintenance
 - \$81 Million Total**

(The itemized Budget is shown on the following slide)

Funding Request Item	Purpose	[\$M]
Capital		
Test, Assembly & Packaging Tools/Equipment and Installation 2016 Carry-Over	Continued Installation of Base Capability	\$ 10
Test, Assembly & Packaging Tools/Equipment and Installation	Additions Capability	\$ 25
Wafer Fab & MPWA Tools/Equipment	Improvement to Capability, Additions to Capacity, Reduction of Process Cycletime	\$ 30
Bio Safety Lab Tools & Equip	Additions to Capability	\$ 1
Test, Assembly & Packaging Manufacturing Execution System (MES)	Addition to Capability	\$ 5
TOTAL CAPITAL		\$ 71
Operations and Maintenance		
Education and Workforce Development (UR \$0.5M, RIT \$0.5M)		\$ 1
R&D Project State Match (UR 1.0M, RIT \$1.0M)		\$ 2
AIM Operating Wafer, Test Package, Assembly Budget		\$ 7
TOTAL O&M		\$ 10

Proposed 2017 - 2018 Budget \$ 81



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