American Institute for Manufacturing Integrated Photonics

NY Photonics Board Meeting
TAP Update and
2018 Budget Request

March 2, 2018
Phase I – Offices/Conf. Rooms/Bathrooms
The Team

**Design/Build**

- LeCHASE CONSTRUCTION
- SWBR
- BERGMANN ASSOCIATES
- ON Semiconductor

**Tool Install**

- THE PIKE COMPAN
- Building Relationships Since 1849
- DPS
Construction of facility continues

- Offices/Conf. Rooms/Break area and bathrooms are substantially complete
- Labs/Cleanrooms will be substantially complete March 31st (Work will continue on some utilities)

- Process Tools on order or in the process of being ordered (> 100 tools slated for TAP)
  - SUNY Poly – UR – RIT all participating in tool procurement process
  - Tools began arriving 1Q2018

- Tool Installation
  - Pike/DPS contract in negotiation
  - Tool Install to begin early April (*Installation of services for specific tools*)
  - Installation of tools follows tool services

<table>
<thead>
<tr>
<th></th>
<th>Nov 2017</th>
<th>1Q2018</th>
<th>2Q2018</th>
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<tbody>
<tr>
<td>Offices Complete and Available</td>
<td>Available</td>
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<tr>
<td>Labs Ready to Receive Tools</td>
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<tr>
<td>Cleanrooms Ready to Receive Tools</td>
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<tr>
<td>Tool Installation</td>
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<tr>
<td>Customer</td>
<td>Work</td>
<td>Estimated Timing</td>
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<tr>
<td>A</td>
<td>General Test, Assembly &amp; Pkg (Uses Considerable Capacity)</td>
<td>End of 3Q2018</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Die Attach</td>
<td>4Q2018</td>
<td></td>
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<tr>
<td>C</td>
<td>Die Attach/Electronic Pkg</td>
<td>1Q2019</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Laser Attach/Fiber Attach/Electronic Pkg</td>
<td>2Q2018</td>
<td></td>
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<tr>
<td>E</td>
<td>Die Attach/Fiber Attach/Electronic Pkg</td>
<td>TBD</td>
<td></td>
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<tr>
<td>F</td>
<td>Laser Attach/Fiber Attach/Electronic Pkg</td>
<td>4Q2018</td>
<td></td>
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<td>G</td>
<td>Fiber Attach/Laser Attach</td>
<td>TBD</td>
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<tr>
<td>H</td>
<td>Wafer Scale Pkg (Utilizes moderate capacity)</td>
<td>4Q2018</td>
<td></td>
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<tr>
<td>I</td>
<td>Laser Attach</td>
<td>2019/2020</td>
<td></td>
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<tr>
<td>J</td>
<td>Die Attach</td>
<td>TBD</td>
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The previous budgets allowed to establish the facility and buy the equipment set for the TAP facility

- **TAP facility choice and build-out**
- **Full equipment set for wafer scale packaging**
- **Photonic packaging and high speed test**
- **Floor control system (line logistics and analysis)**

<table>
<thead>
<tr>
<th>Amount</th>
<th>Period</th>
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<tr>
<td>$106 Million</td>
<td>April 1, 2016 – March 31, 2017</td>
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<td>$ 81 Million</td>
<td>April 1, 2017 – March 31, 2018</td>
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<td>$187 Million</td>
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<td>$ 63 Million</td>
<td>Remaining</td>
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<td>$250 Million</td>
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Spending Status of Cost Share (incl. NY)

- $50,000,000
- $100,000,000
- $150,000,000
- $200,000,000
- $250,000,000

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The 2018 budget request completes the State commitment

- Remaining operational funds (UR, RIT, TAP start-up operations)
  - 3 years @ $10M/year
- Minimum reserve (1%)
- A proposed $30M incentive to attract companies to the TAP facility and the business park, with the following conditions:
  - AIM membership
  - Integrated photonics
  - Users of TAP (and wafer capability)
  - Company match criteria
  - Minimum company maturity

$ 30 Million Operational cost 2018 – 2020
$ 30 Million Photonics Attraction Fund
$ 60 Million

$ 3 Million Remaining reserve for capital equipment in Rochester
Photonics Attraction Fund

- Proposed by Governor Cuomo in the 2018 State of the State Excelsior Agenda
- $30 Million dedicated fund to attract companies with integrated photonics technologies/products to locate manufacturing operations in greater Rochester
- Projects will be individually funded by Empire State Development
- Projects will be evaluated based on private investment and job creation, among other potential economic benefits to AIM and the region’s OPI industry cluster
- Funding is part of the State’s $250M commitment to AIM Photonics
- Companies receiving funding will be required to have a formal membership/agreement with AIM Photonics, ideally with a direct benefit to the TAP facility
Appendix: Education & Workforce Development

- **AIM Summer & Winter Academies**
  120+ attendees
  - “World class, cutting edge and the state-of-the-art content on the subject matter.”
  - “For me, the Summer Academy at MIT was one of the best courses in Integrated Photonics I have seen. The content was excellent, original and absolutely not banal.”

- **AIM Photonics Technical Meetings**
  Spring & Fall Meetings at MIT & SUNY Poly:
  - 160 experts attended the spring meeting and 200 attended the fall meeting
  - Ratings: Meeting was “extremely positive” and Roadmap “extremely effective”

- **Roadmap**
  800+ downloads of the Roadmap

- **Future Leaders Program**
  11 rising seniors from across the country participated in research internships at MIT, SUNY Polytechnic Institute, the University of California Santa Barbara and the University of Arizona.
  - “The hands on and practical experience made me more confident to pursue this field.”
  - “The research itself and the people I met through the internship were the most valuable experiences to me.”

- **Internship Matching Program**
  Roughly ten rising college seniors will be matched to companies with summer internship openings in photonics or integrated photonics

- **LEAP (Lab for Education and Application Prototypes)**
  Constructing LEAP network, with sites now at WPI/QCC and MIT, which will tie into the SUNY Poly and Rochester facilities
  - Four industry outreach workshops

- **Teaching Packages, Self-Paced Online Courses**
  - 13 downloadable teaching modules that will be adapted into online courses

- **MITx Online Courses**
  - Instructor-led online courses in integrated photonic design, and in the future, testing & packaging
  - Opportunity to learn how to make an AIM Photonics chip and then test/package it at the TAP facility