Summary:

- 19 awards totaling $9M in NIST funding
- From funded consortia – two were photonics awards, Rochester, INEMI
  - NTRP, PSMC overview
- Group Comments:
  - Semi-conductor roadmap can be used as example for photonics roadmap creation. Strengthen supply chain through stratification.

NIST/AMTech NTRP Consortium Review Meeting

Thomas R. Lettieri

NIST/AMTech Project Manager

September 10, 2014

NTRP

National Technology Roadmap for Photonics

NIST

National Institute of Standards and Technology

U.S. Department of Commerce

What is AMTech?

The Advanced Manufacturing Technology Consortia (AMTech) Program

Launched by NIST in FY 2013

- To incentivize the formation of, and provide resources to, industry-driven consortia
  - Supports both basic and applied research
  - Focuses on long-term, pre-competitive, and enabling technology development
- For the U.S. manufacturing industry

The goal of AMTech-supported consortia will be to strengthen the capacity of U.S. industry and the nation to compete in global markets

How Will AMTech Work?

- Once fully implemented, NIST envisions AMTech to offer funding in two broad areas: *planning awards* and *implementation awards.*
- The FY 2013 AMTech *planning awards* funded eligible applicants to create new, or strengthen existing, industry-led technology consortia.
- AMTech-supported consortia will:
  - Identify and prioritize long-term, pre-competitive industrial research needs;
  - Enable technology development;
  - Create the infrastructure necessary for more efficient transfer of technology;
  - Represent a broad range of involved firms across all stages of the value chain.
- There is no formal connection between AMTech and NNMI.

2013 Planning Grants

- To establish and strengthen new and existing industry-led consortia that are focused on developing advanced technologies to address major technical problems that inhibit the growth of advanced manufacturing in the U.S.

- To identify and prioritize research projects supporting long-term industrial research needs and a range of eligible activities including, but not limited to, creating new or updating existing industry-led, shared-vision technology roadmaps for the development of technologies underpinning next-generation and/or transformational innovations.

- To undertake other activities designed to establish and strengthen new and existing industry-led, multi-partner consortia that catalyze technology infrastructure and American excellence in advanced manufacturing.

2013 Competition Results

Nineteen Awards totaling $9 million in NIST funding

Consortia Characteristics

Status: 11 New

8 Existing

Crosscutting Technologies (# of efforts):

- 1 - Additive Manufacturing
- 2 - Advanced Forming & Joining Technologies
- 7 - Advanced Manufacturing & Testing Equipment
- 2 - Advanced Materials Design, Synthesis & Processing
- 1 - Advancing Sensing, Measurement & Process Control
- 1 - Biomanufacturing & Bioinformatics
- 1 - Flexible Electronics Manufacturing
- 2 - Sustainable Manufacturing
- 2 - Visualization, Informatics & Digital Manufacturing Technologies

2013 Competition Results (cont'd)

Funded Projects

Electrochemical Pathway for Sustainable Manufacturing (EPSuM) Consortium	Ohio University
Consortium for Accelerated Innovation and Insertion of Advanced Composites (CAIIAC)	Georgia Tech Research Corporation
Pathway to Improved Metalcasting Manufacturing Technology & Processes - Taking Metalcasting Beyond 2020	American Foundry Society
Thermal Manufacturing Industries Advanced Technology Consortium (TMI ATC)	ASM International
MTConnect Roadmap Strategy to Promote Advanced Manufacturing in the United States	National Center for Defense Manufacturing and Machining
Advanced Simulation and Visualization for Steel Optimization Consortium	Purdue University
Technologies for Advanced Manufacturing of Pulp and Paper Products	Agenda 2020 Technology Alliance, Inc.
SMART Wind Consortium: Developing a Consensus Based Sustainable Manufacturing, Advanced Research and Technology Roadmap for Distributed Wind	Distributed Wind Energy Association
Facilitating Industry By Engineering, Roadmapping and Science (FIBERS) to Advance U.S. Manufacturing of Composites	University of Massachusetts Lowell
National Technology Roadmap for Photonics (NTRP)	University of Rochester
Semiconductor Supply Chain Road Mapping	SEMATECH, Inc.
Architecting an Institute for Flexible Electronics Manufacturing	AZ Board of Regents on behalf of Arizona State University
Development of a Comprehensive Advanced Joining and Forming Technology Roadmap	Edison Welding Institute
Cell Manufacturing Consortium	Georgia Research Alliance
Development of Roadmap and Consortium for Innovation in Sheet Metal Forming	Northwestern University
Strengthening the Domestic Power Electronics Ecosystem	Power Electronics Industry Collaborative
Partnership for Research and Innovation in Sustainable Manufacturing (PRISM): Product, Process and System Integration	University of Kentucky Research Foundation
Consortium for Additive Manufacturing Materials (CAMM)	The Pennsylvania State University
Photonic Systems Manufacturing Consortium (PSMC)	International Electronics Manufacturing Initiative, Inc.

For details visit: www.nist.gov/amo/fundedawards.cfm

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DWEA SMART Wind Consortium Pre-Kickoff

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PRISM Sustainable Manufacturing Consortium (University of Kentucky)

Aerospace Industry

GE Aviation

Automotive Industry

Toyota Motor Manufacturing

Consumer Electronics Industry

Lexmark International

Automotive Manufacturing Technical Education Collaborative

AMTEC
Ignite. Educate. Accelerate.

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2014 AMTech Competition

- AMTech anticipates awarding a total of $5.6 million in (2-year-maximum) grants during the program's second competition. Awards will range between about $250,000 and $500,000, subject to the availability of funds.

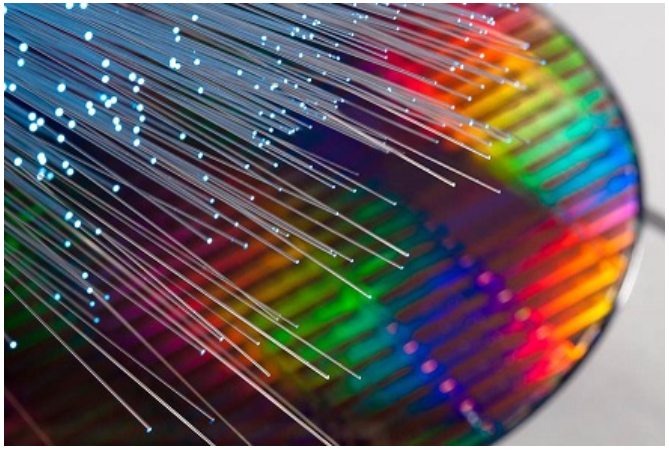
- Pre-applications are required and were due on Sept. 5, 2014. Selected pre-applicants will be invited to submit a full application, which is due on Oct. 31, 2014.

- Selections will be announced during the first half of 2015.

National Technology Roadmap for Photonics (NTRP)

Project Objectives

- Develop manufacturing technology roadmaps in 5 areas of photonics (optics, lasers, imaging/sensing, displays, and bio-photonics).
- Identify opportunities for **pre-competitive collaboration** in a private-public partnership.



Lead Organization: University of Rochester

Funded Collaborators:

Rochester Institute of Technology

Rochester Regional Photonics Cluster

NIST Funding: $497,852

Project Period: June 2014 to May 2016

NIST POC: Thomas R. Lettieri

301-975-3496

thomas.lettieri@nist.gov

Project POC: Paul Ballentine

585-748-1408

paul.ballentine@rochester.edu

Project Event

- Technical Working Group kickoff meeting at OSA Headquarters (Washington, DC), Sept. 10, 2014

Project Deliverables

- A set of public roadmaps in the 5 photonics areas (May 2016)
- A set of recommendations for a national institute for photonics (May 2016)

NTRP

National Technology Roadmap for Photonics

NIST National Institute of Standards and Technology U.S. Department of Commerce

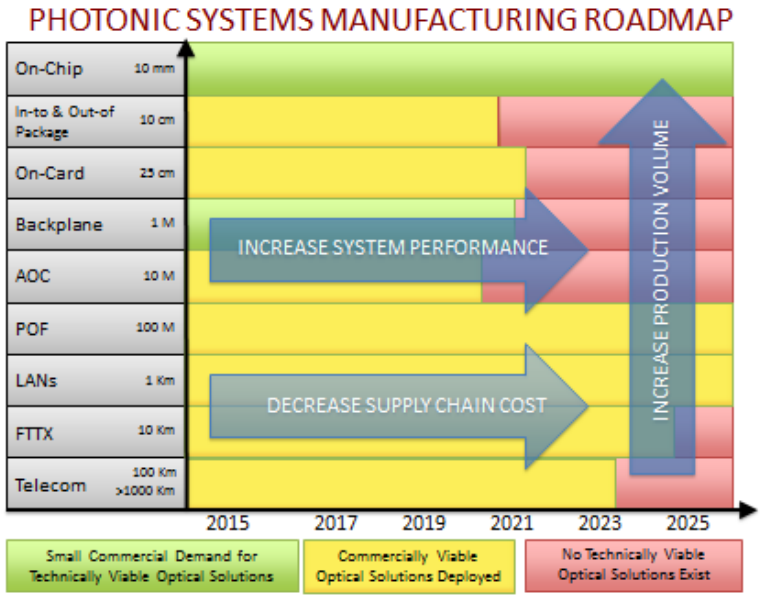
Photonic Systems Manufacturing Consortium (PSMC)

Project Objectives

- Define timelines and technology gaps/ roadblocks for the U.S. photonic systems manufacturing industry
- Design a manufacturing platform for cost-effective, high-volume manufacturing of integrated photonics systems

Lead Organization: International Electronics Manufacturing Initiative

Funded Collaborator: Massachusetts Institute of Technology



NIST Funding: $539,990

Project Period: June 2014 to May 2016

NIST POC: Thomas R. Lettieri
301-975-3496
thomas.lettieri@nist.gov

Project POC: Robert C. Pfahl
630-965-2462
bob.pfahl@inemi.org

Project Event

- Workshop at MIT on November 6-7, 2014

Project Deliverables

- A roadmap for integrated photonics systems manufacturing
- Technology-based models of the cost and supply chain dynamics for the transition to high-volume, integrated photonic systems manufacturing in the U.S.

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PSMC Technology Working Groups (TWGs)

TWG	Chair	Scope
Hybrid Integration	Dick Otte otte@promex-ind.com	Cost, integration, assembly, test, functionality, tools
Packaging	Bill Bottoms bill_bottoms@3mts.com	Cost, materials, heat, footprint, port count, bandwidth
Connector & Substrate	John MacWilliams jmacwilliams@bishopinc.com	All separable interfaces within the system scope All circuit board and backplane components
Monolithic Integration	Lionel Kimerling lckim@mit.edu	Chips: silicon photonics, InP; Design for Manufacturing; Tradeoffs for cost, bandwidth density, power efficiency, and functional latency

To join a TWG, contact the TWG leader

For further details, visit: www.photonicsmanufacturing.org

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Miscellaneous

- **AMTech's goal** is for funded consortia to have broad National impact, so collaboration with NIST and other Federal agencies is encouraged.

- **NIST personnel** can, and are encouraged to, participate in any of the consortia and roadmapping activities (just coordinate first with the appropriate NIST/AMTech project manager).

- The **AMTech Website** will list dates for all consortia meetings, workshops, and other events, as well as due dates for roadmaps and other deliverables. It will link to all consortia Websites.

- AMTech has published **on-line consortia maps** to illustrate the National scope of participation.

- AMTech has a **LinkedIn account** that is available for consortia use. Recipients should use it to share information and seek input.

For further information, visit the AMTech Website at www.nist.gov/amo