

AIM Photonics and Empire State Development: Advancing New York's Innovation Economy

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Introduction to AIM Photonics

AIM PHOTONICS

Established in 2015, AIM Photonics is a Manufacturing Innovation Institute created and managed by the U.S. Department of Defense to advance new technology and capabilities into products and systems that help secure national defense and economic priorities.



What is Integrated Photonics?



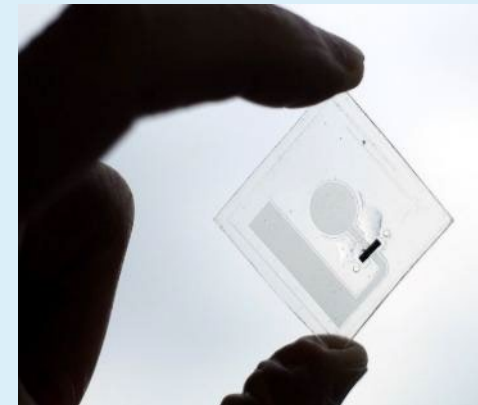
Integrated photonics enables a wide range of high-impact applications – critical for both national defense and a robust economy.

Photonic Integrated Circuits (PICs)

PICs route and manipulate light (photons) rather than current and voltage (electrons) but are fabricated using the same foundry equipment used to create microelectronic circuits.

Applications Include:

- Datacom/Telecom
- Chemical/Bio Sensors
- Precision Navigation and Timing
- Quantum Computing
- AR/VR/LiDAR
- Defense Applications (SWaP-C)



Integrated photonics shrinks all photonic devices—lasers, LEDs, waveguides, detectors, modulators, splitters, resonators, gratings, couplers, and many more—into microchips, realizing small, low-power, lightweight devices.

AIM Photonics is a U.S.-based leader in integrated photonics manufacturing and design. We bridge gaps between basic research and product development for PICs and packaging.

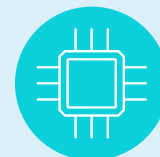
OUR MISSION

Create a manufacturing and design ecosystem that bridges the current gap between basic research and product development in the emerging photonic integrated circuit industry



RESEARCH & DEVELOPMENT

New and innovative technologies, processes, and materials within the integrated photonics sphere, addressing high-risk, high-reward challenges in photonics integrated circuit manufacturing technology.



TECHNOLOGY OFFERINGS

State-of-the-art integrated photonics fabrication, packaging, and testing facilities, providing services to industry, academia, and the United States government.



EDUCATION & WORKFORCE DEVELOPMENT

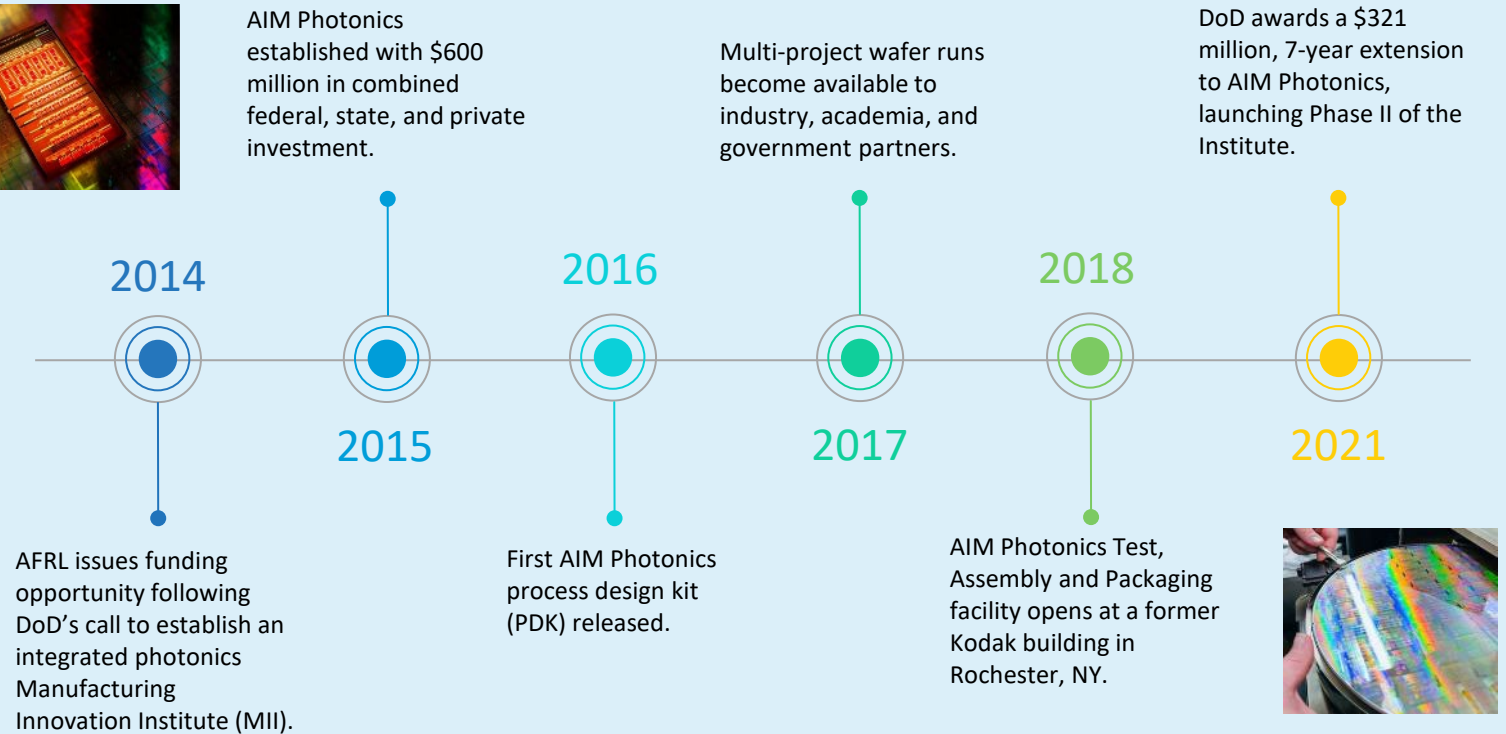
Dynamic training for creating an adaptable and robust integrated photonic circuit workforce that meets the industry's needs, furthering domestic competitiveness and readiness.

AIM Photonics: A Department of Defense Manufacturing Innovation Institute



Focus Area: Integrated Photonics

- AIM Photonics is tasked with:
 1. Advancing the photonics and packaging U.S. Industrial Base
 2. Making the technology accessible
 3. De-risking tech start-ups
 4. Building a skilled workforce
- The federal government invested in AIM Photonics as an accessible electronic and photonic packaging facility.
- New York State's Empire State Development invested in AIM Photonics' Test, Assembly and Packaging (TAP) facility, allowing for significant improvements and enhancements.



We Offer a Unique Combination of Accessible, Customizable 300 mm PICs and Packaging for the Domestic Photonics Infrastructure



Prototype



Custom Packaging



Accessible PICs



Rochester



Albany



...allowing rapid development of state-of-the-art integrated photonic devices in an entirely domestic environment.

Fabrication and Test Facilities



We offer accessible, best-in-class, state-of-the-art 300 mm photonic integrated circuit multi-project wafers, heterogeneous integration, interposers, and test, assembly, and packaging capabilities and services.

Albany NanoTech Complex



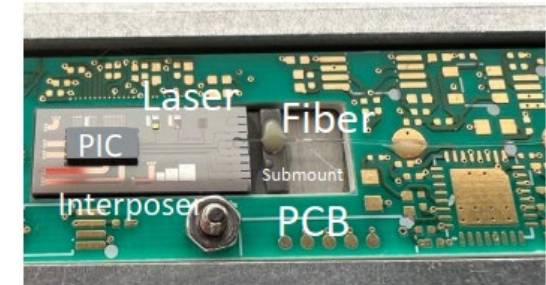
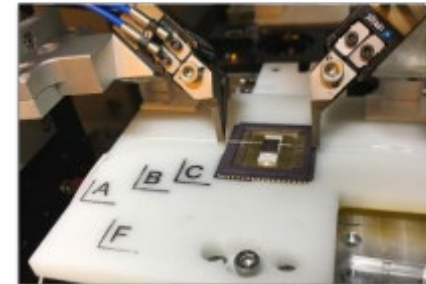
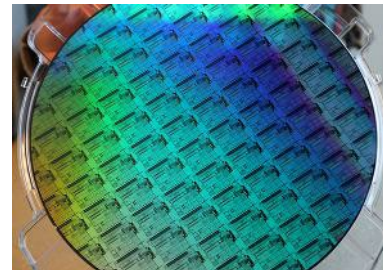
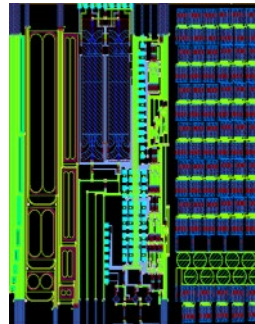
AIM Photonics utilizes the \$25B NY Creates' Albany NanoTech Complex in Albany, NY—the nation's largest and most advanced non-profit semiconductor R&D facility. The complex features over 150,000 square feet of class-1 cleanroom space and a state-of-the-art 300 mm fabrication line.

Test, Assembly, and Packaging (TAP) Facility



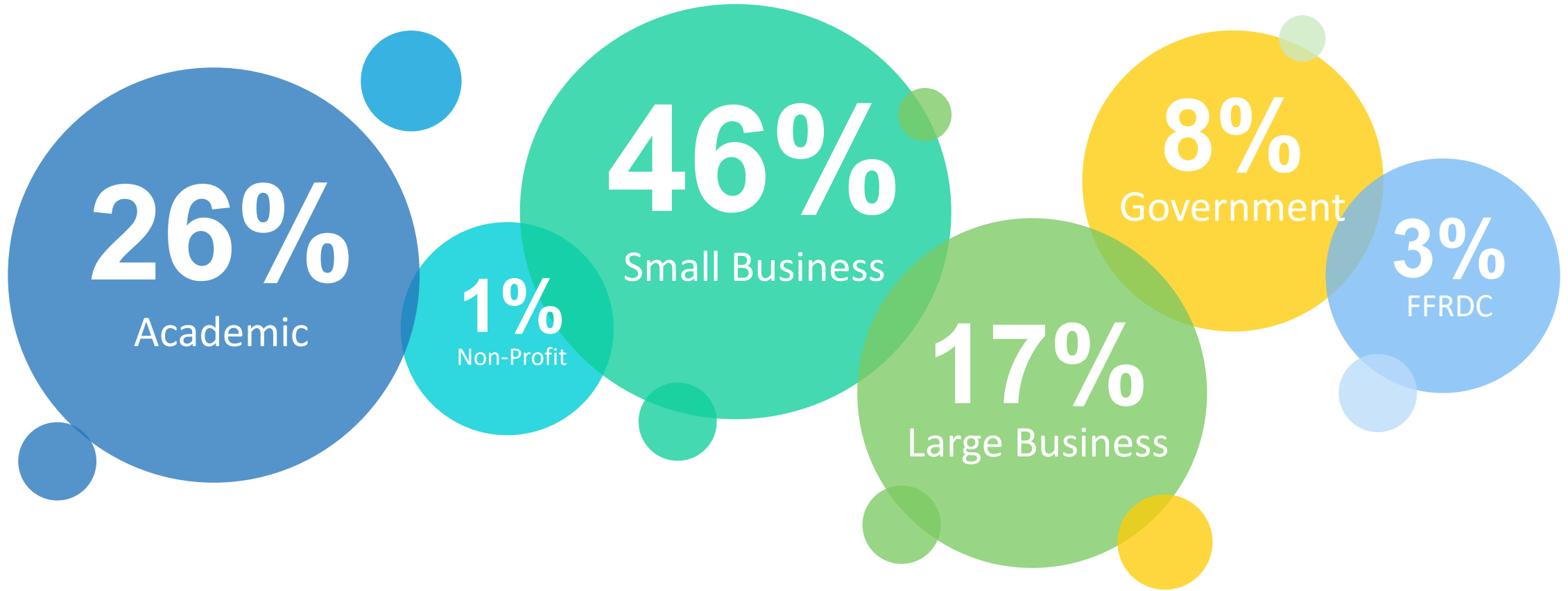
AIM Photonics operates the Test, Assembly and Packaging Facility in Rochester, NY, which has 12K square feet of class-100 cleanroom space and leverages a \$250M NYS investment in packaging. TAP offers the most comprehensive suite of accessible photonics packaging tools available in a single U.S. facility.

We Serve the Integrated Photonics Infrastructure by Offering an End-to-End Process Flow



AIM Photonics offers a coordinated, mutually supported development of all process stages, making it faster and easier to develop applications that use PICs.

AIM Photonics' ecosystem includes 304 organizations. These are members, customers, and collaborators.



Examples of organizations that power and benefit from AIM Photonics



Development



TEL



Enablement

SYNOPSYS®

cādence®

Ansyst
part of SYNOPSYS®

SPARC
PHOTONICS

FREEDOM
PHOTONICS
a Luminar company

TEKSCEND
PHOTOMASK

Education



MIT

B

RIT

RPI

THE UNIVERSITY
OF ARIZONA

Application

ANAMETRIC

photonics SiPhox

phase
sensitive
innovations

LOCKHEED MARTIN

Government



Sandia
National
Laboratories

Manufacturing
USA

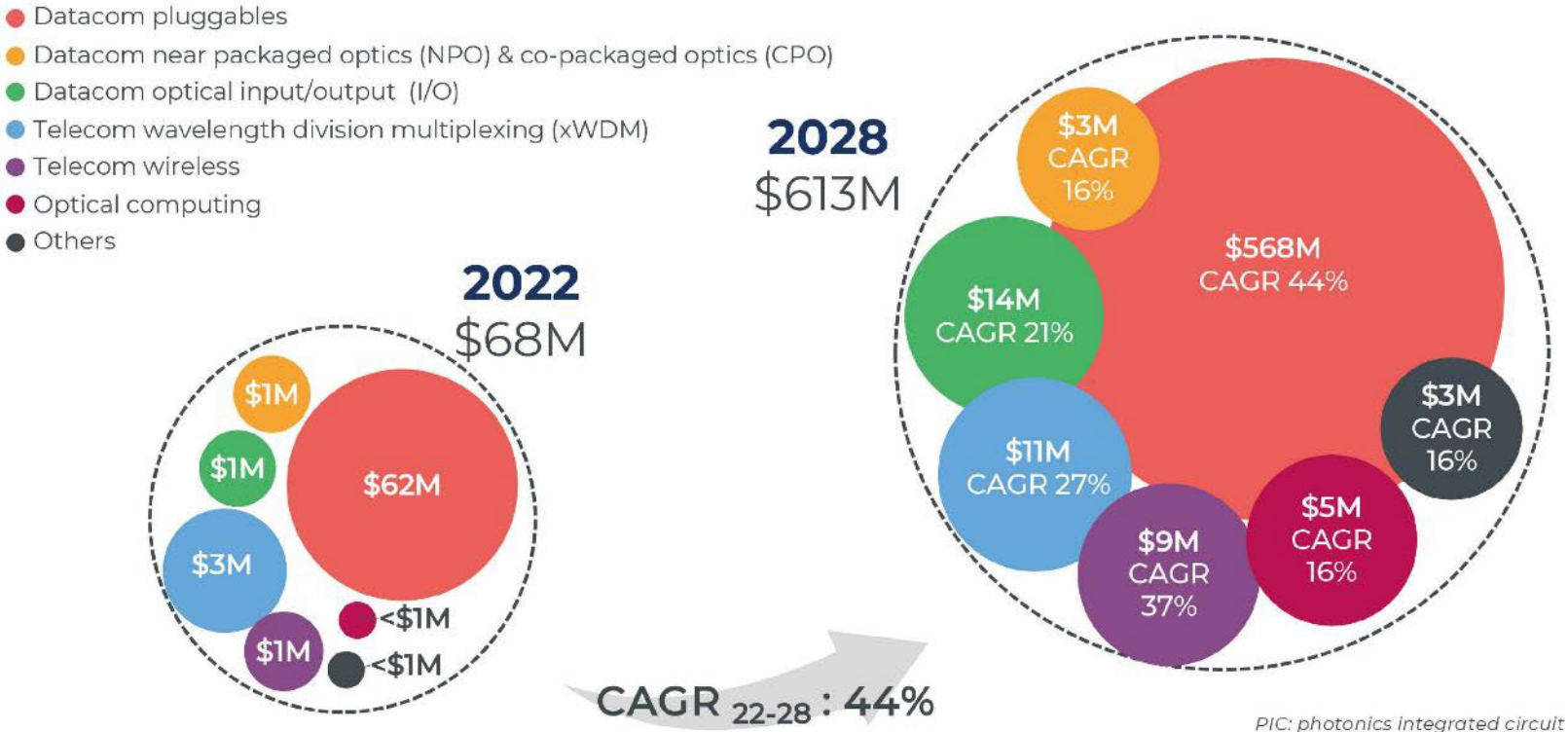
LINCOLN LABORATORY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NIST

The Silicon Photonics Landscape

2022-2028 SILICON PIC DIES REVENUE GROWTH FORECAST BY APPLICATION

Source: Silicon Photonics 2023 report, Yole Intelligence, 2023



AIM Photonics and New York State (NYS)

CATN2: A Catalyst for Innovation



NYS Center for Advanced Technology in Nanomaterials and Nanoelectronics (CATN2)

The mission of the CATN2 is to drive systematic progression in technology transitions, market adoption, skills attainment & entrepreneurial growth through UAlbany's aligned research capabilities including its industry cooperation partners to transition innovation to commercial success by supporting the research, development, & deployment (RD&D) continuum.



Empire State Development's Division of Science, Technology, and Innovation (NYSTAR) funds fifteen Centers for Advanced Technology (CATs) to **encourage greater collaboration between private industry and universities in the development of new technologies.**

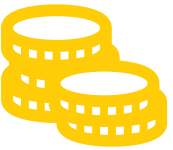
- CATN2 helped develop the proposal for the Integrated Photonics Institute for Manufacturing Innovation funding call
- To develop the response, CATN2 brought together New York State(NYS) stakeholders, including universities and NYS companies, ultimately going to NYS who pledged \$250M in funding



New York State Investment



**Empire State
Development**



\$250M



Capacity for increasing equipment
to support MPW at the NY Creates'
Albany NanoTech Complex



Enhancement of optical packaging
capability, including state-of-the art
automation and EPDA at TAP

TAP Enables the Industry

- Bridges the gap between fabs and traditional packaging OSATs
- Accelerates timelines through on-site collaboration
- Advances next-gen packaging using of new materials and processes, supporting innovators and supply chains
- Expands access to new technologies through partnerships with tool manufacturers

Strengthening Integrated Photonics in NYS and Across the U.S.



GROWTH

The NYS investment secured the placement of a DoD-sponsored MII within the state, driving industry and workforce growth in integrated photonics manufacturing.

PARTNERSHIP

The NY Manufacturing Extension Partnership (NY MEP) program, which is managed through ESD, helps engage industry in targeted programs to address technology and business barriers to widespread adoption.

IMPACT

AIM Photonics lowers the cost and risk of entry for small- to medium-sized enterprises, enabling industry growth and sustainability within NYS and the U.S.



Building the NYS and Domestic Workforce

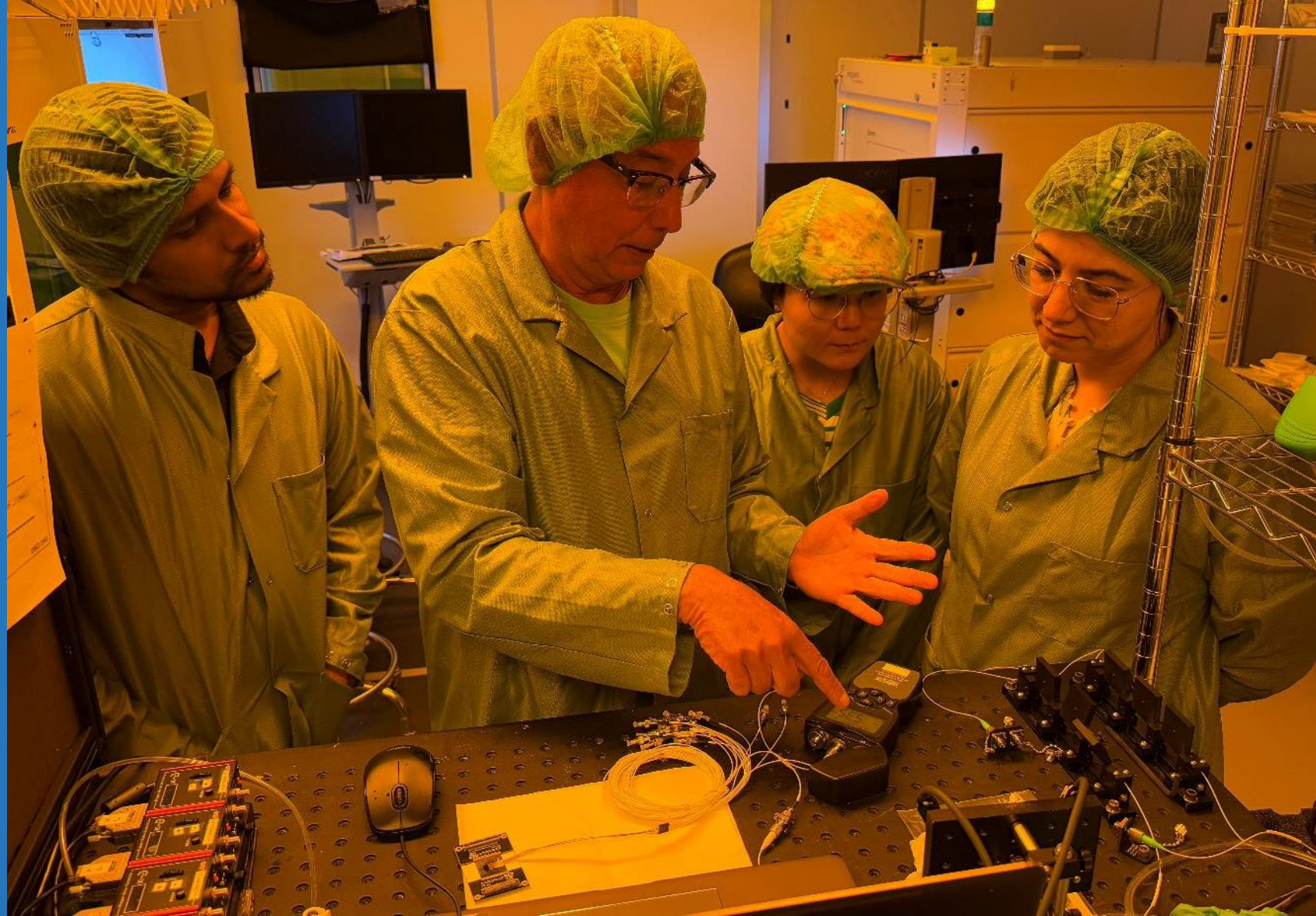


EDUCATION AND WORKFORCE DEVELOPMENT

AIM Photonics supports a comprehensive talent pipeline, from early K-12 exposure to community college, university, and current worker training. These programs strengthen NYS' talent pipeline and expose students to opportunities available within the state.

HANDS-ON TRAINING

Strategic partnerships with NYS universities are integral in the development of AIM Photonics' workforce initiatives. Together with RIT and the University of Rochester, AIM Photonics offers synchronous online training, in-person workshops, and experiential learning. The Institutes also hosts an annual summer internship program at our Albany and Rochester facilities.



Conclusion

Driving New York's Innovation Economy Through Strategic Partnership



The Power of the AIM Photonics & ESD Ecosystem

Strategic Federal-State Synergy

Unmatched Accessible Infrastructure

Economic Impact & Sustainability

A Future-Ready Talent Pipeline



Advancing New York's leadership in integrated photonics to secure national defense and economic priorities.

Thank you

