The American Institute for
Manufacturing Integrated Photonics

AIM PHOTONICS

Albany NanoTech Complex
Albany, NY
Test, Assembly and Packaging Facility
Rochester, NY

Wade Cook
September 24, 2025

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.

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 Core Areas of Technical Expertise

Accessible end-to-end photonics and packaging

1. Photonic Integrated Circuits
2. Heterogeneous Integration and Interposers
3. Test, Assembly and Packaging
4. Electronic-Photonic Design Automation

1. AIM Photonics has best-in-class 300 mm application-specific PIC technologies
2. AIM Photonics develops electronic and electronic-photonic interposers
3. AIM Photonics offers custom packaging services and supports a packaging roadmap
4. AIM Photonics provides electronic-photonic design automation support through process design kits (PDKs) and assembly design kits (ADKs) for all offerings

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.

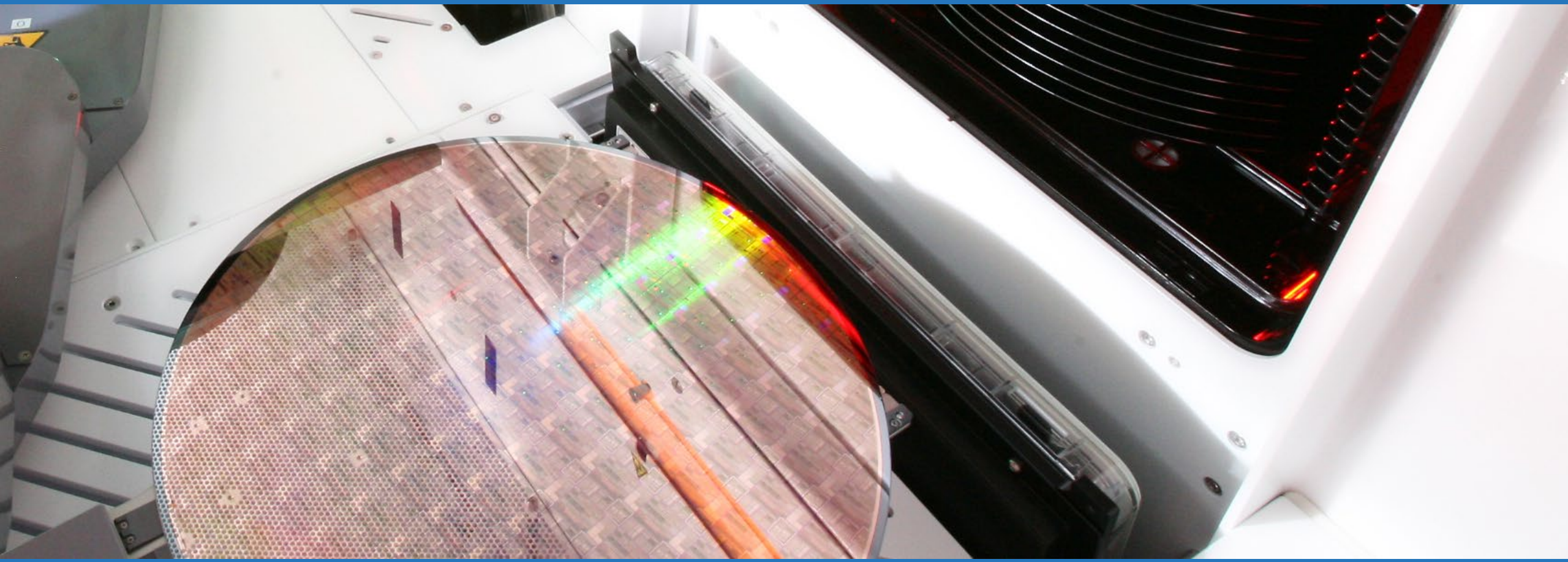
Albany NanoTech Complex

AIM Photonics uses the 300 mm NY CREATES' Albany NanoTech Complex in Albany, NY, which has more than 130K square feet of class-1 cleanroom space.

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.

AIM Photonics Capabilities and Services



Proprietary Process Design Kits (AIM Photonics PDKs)

A PDK is all the information a designer needs to design PICs that will be manufactured via MPW service

Technology
Communications/AI
Sensors
Quantum
Interposers
III-V (Future)
Visible (Future)

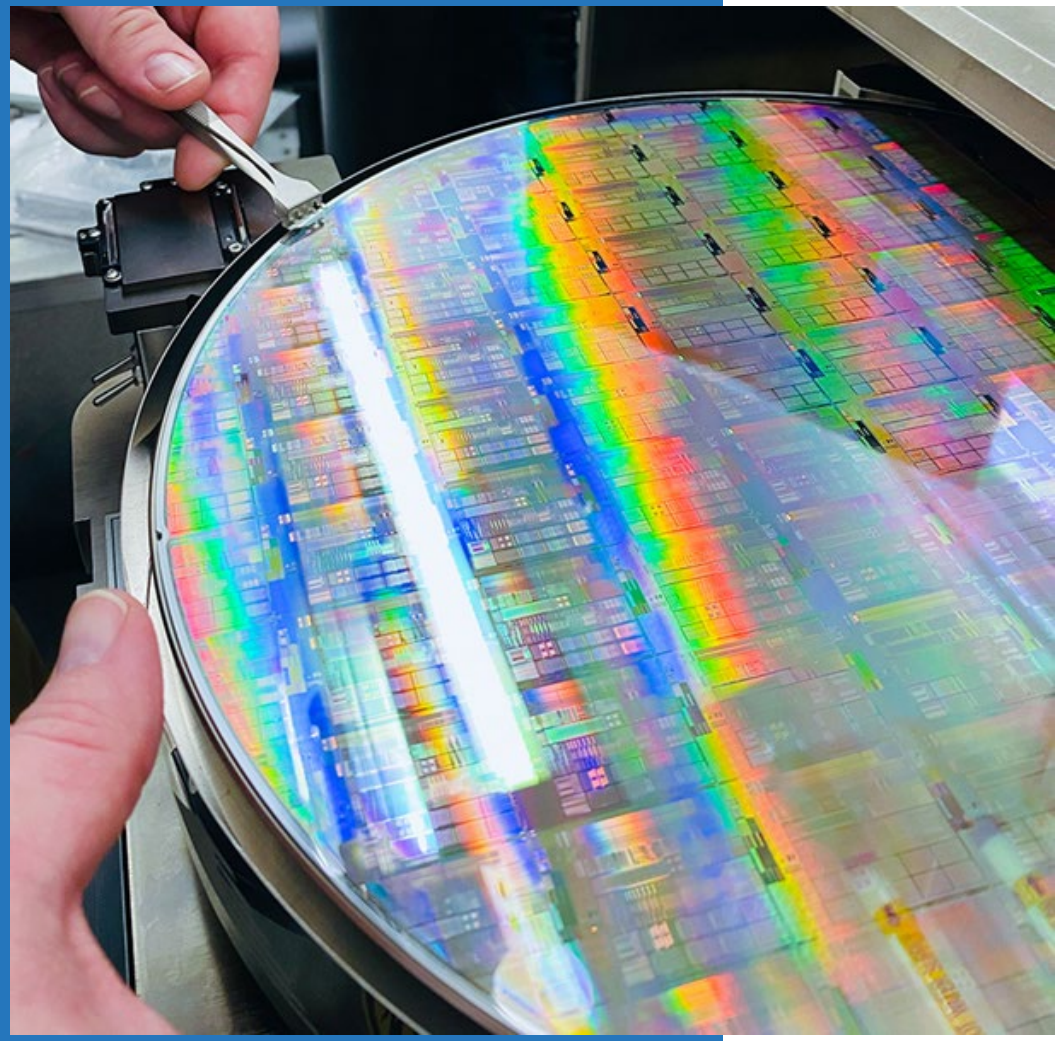
Component Libraries
Analog Photonics
Dream Photonics
RF/SUNY
Spark Photonics
TLX

EPDA Tools
Cadence
Synopsys
Ansys/Lumerical
Siemens EDA
Luceda IPKISS
KLayout/SiEPIC

Our approach to PIC design encourages more participation by:

- Offering application-specific technologies
- Providing multiple component libraries for different applications
- Supporting multiple design software tools
- Demonstrating flexibility in customization

Multi-Project Wafers (MPWs)

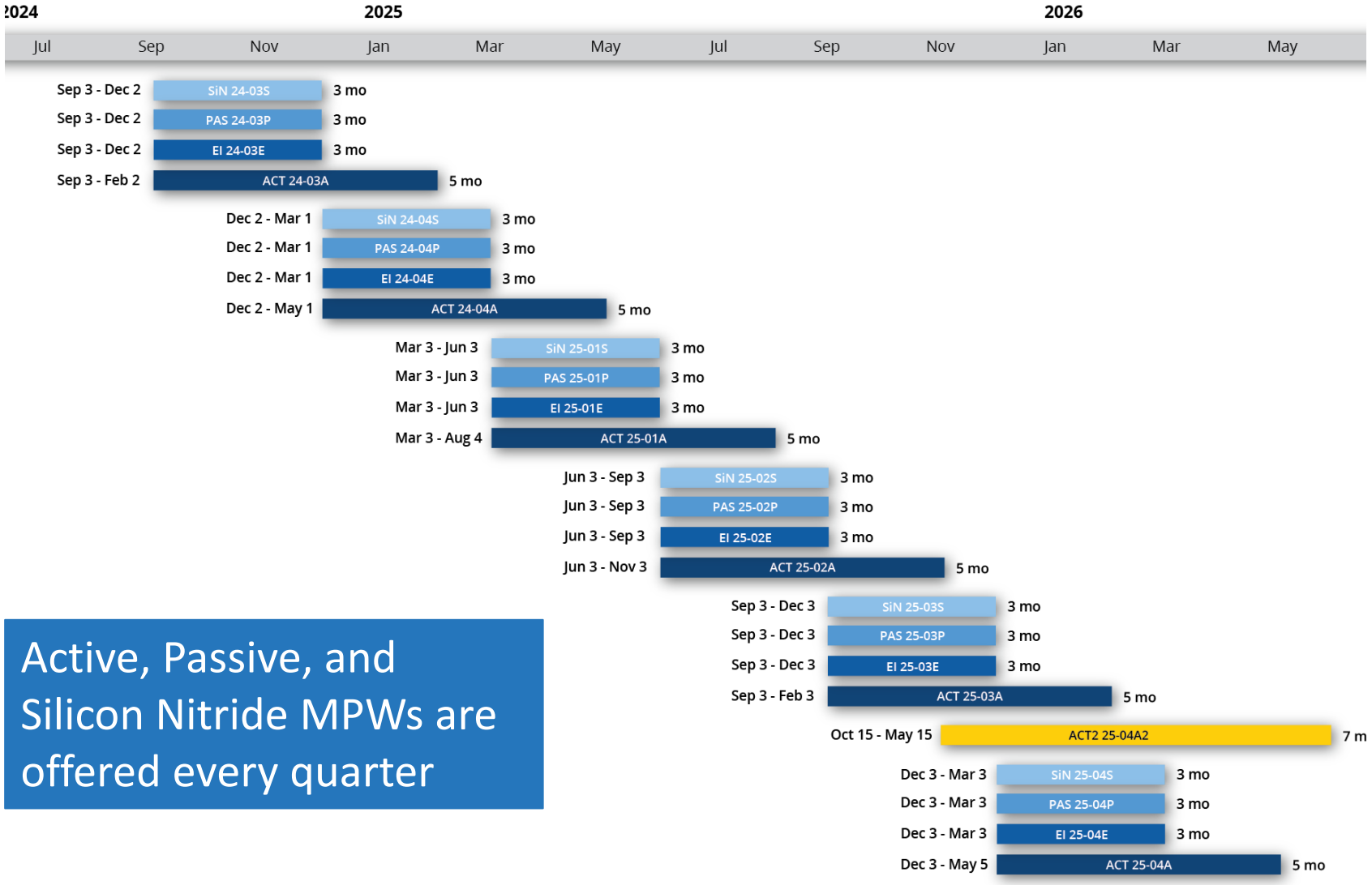


An **MPW** allows several different chip designs to be fabricated simultaneously on a single wafer.

This approach allows for cost-effective prototyping services that enable multiple customers and projects to share common masks, materials, and process flows, **which can significantly accelerate and de-risk the commercialization process**.

Multi-Project Wafer Program

MPW Run Schedule



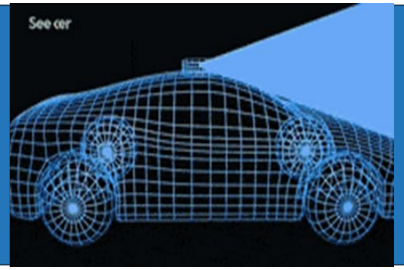
Active, Passive, and Silicon Nitride MPWs are offered every quarter

Advantages:

- Dependable, regular schedule of runs
- Robust base offerings with superior quality
- Rapid turnaround and delivery
- MPW tiles reduce the cost of purchasing entire runs

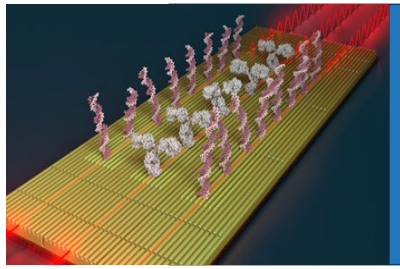
AIM Photonics Application PIC MPW Platforms

Industry/infrastructure-inspired | Application-driven | Evolves with capabilities



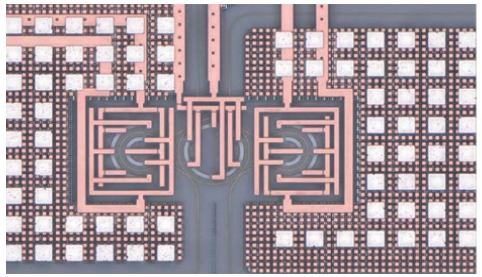
Base Silicon Photonics

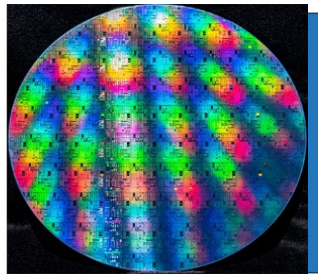
- Mature 300 mm silicon photonic fabrication and design enablement
- Datacom/telecom, free-space coms, LiDAR, sensing, RF photonics
- **Why AIM Photonics:** Repeatable and rapid execution (90d fab), customization is available.



Silicon Nitride

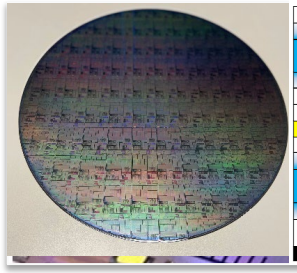
- Passive PIC with silicon-nitride waveguides
- GDP4, chemical/biological sensing, augmented/virtual reality
- **Why AIM Photonics**: Rapid turnaround (<30d fab), customizable low-loss SiN

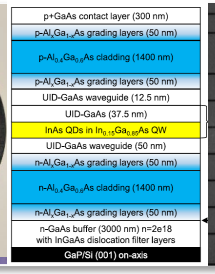


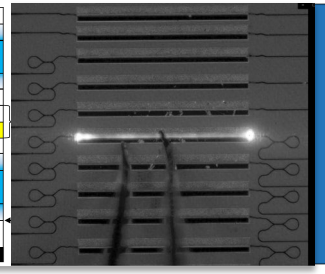


Quantum-Enabled PIC

- Highly advanced, state-of-the-art silicon photonics
- GDP3, elements for quantum computing and networking
- **Why AIM Photonics**: Ultra-low loss Si/SiN, specialized electro-optic devices







Hetero-Epitaxial Lasers Integrated on Silicon (HELIOS) III-V

- Combining III-V epitaxy with silicon photonics from base silicon photonics
- The densest form of integration for lasers and optical amplifiers in silicon photonics
- **Why AIM Photonics:** On-chip gain and light to maximize data bandwidth density

AIM Photonics 300 mm Wafer-Level Heterogeneous Integration

Heterogeneous integration is defined as the integration of separately manufactured components into a higher-level assembly (chiplets, SiPs, modules) that, in the aggregate, provides enhanced functionality and improved operating characteristics

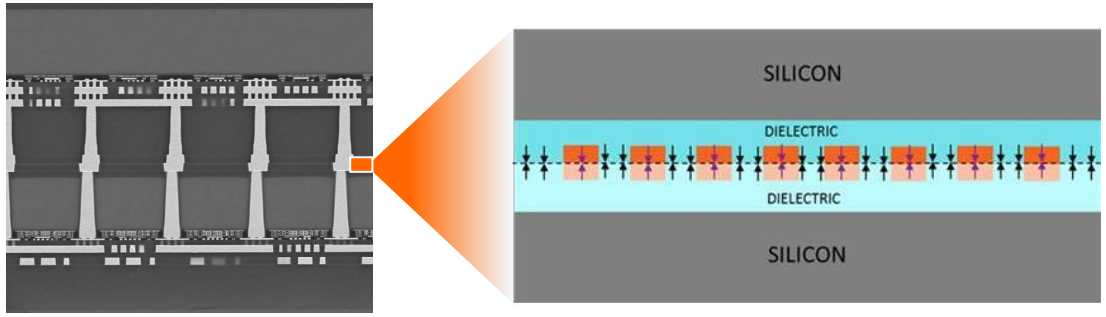
Wafer-Level Operations

Wafer-to-Wafer bonding/de-bonding

Hybrid Bonding

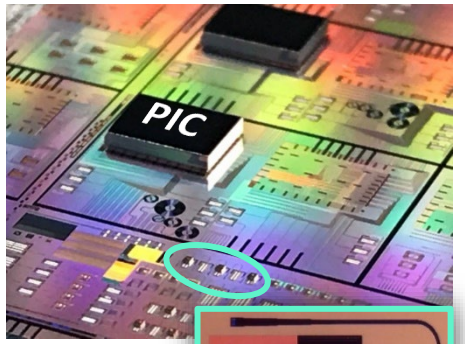
Hybrid Bonding

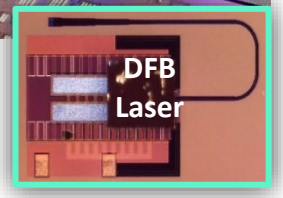
Oxide-Oxide bonding + Cu-Cu bonding



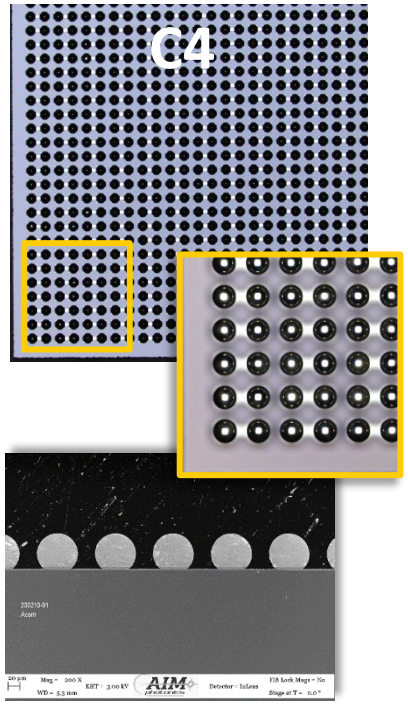
Source: AMD Hot Chips 2021

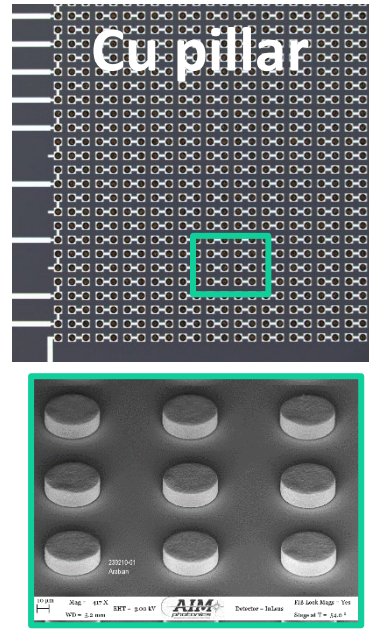
2.5D Chip on Wafer





Dense Bumping

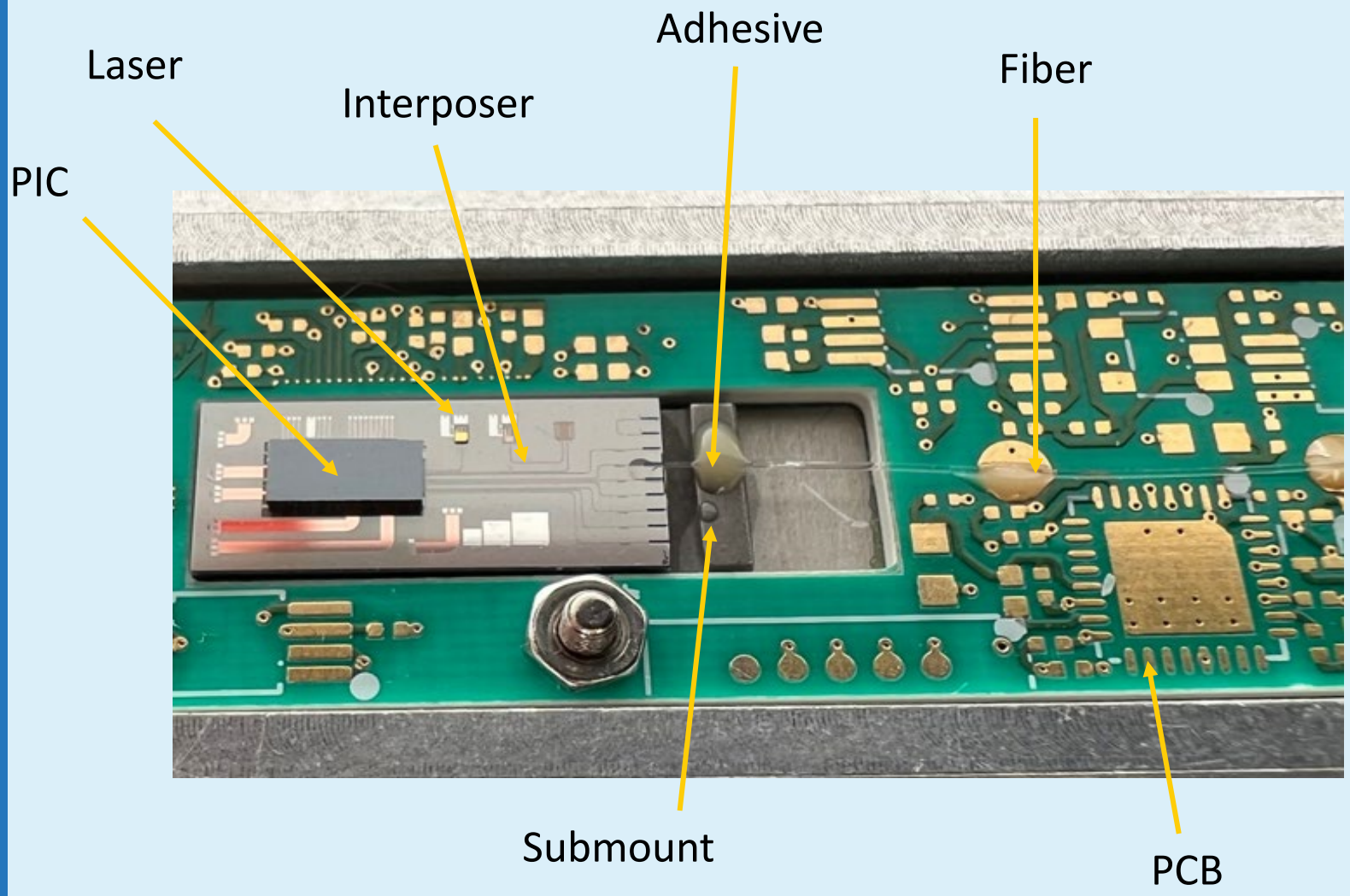




Extensive State-of-the-Art Toolset

TAP Capabilities

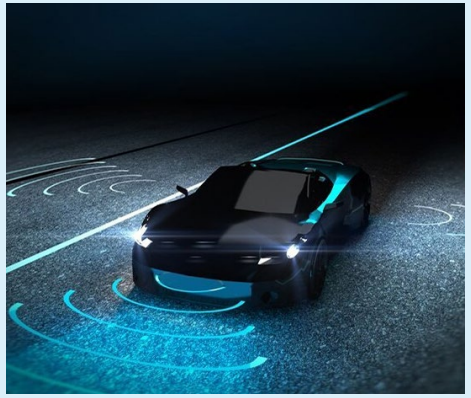
- Solder Bumping
- Singulation (Dicing)
- Flip Chip Bonding
- Die Attach
- Wire Bonding
- Fiber Attach
- Test and Metrology of Photonic and Electronic Devices
- Heterogeneous Integration

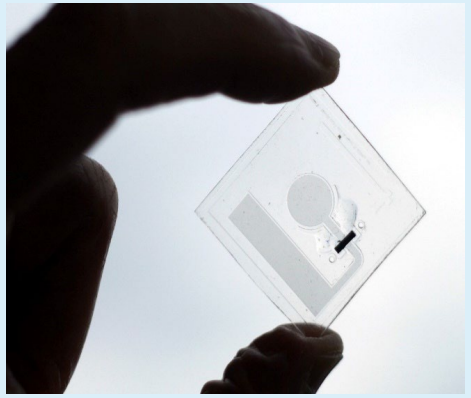


AIM Photonics Application Areas

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.

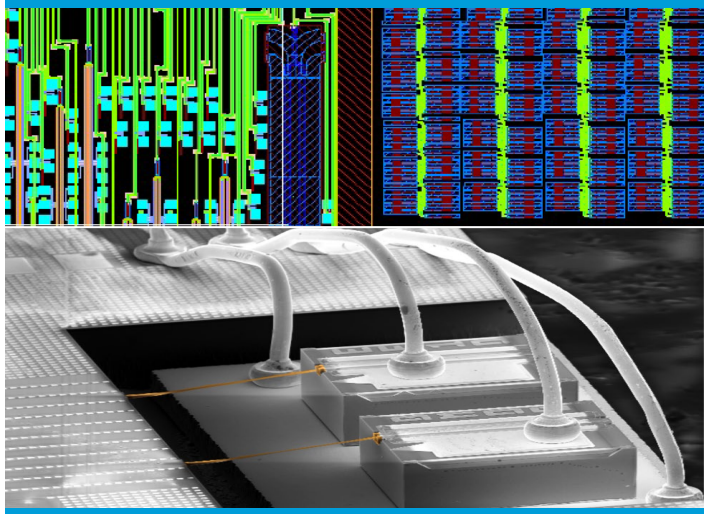
- Datacom/Telecom
- Chemical/Bio Sensors
- Precision Navigation and Timing
- Quantum Computing
- AR/VR/LiDAR
- Defense Applications (SWaP-C)


AIM Photonics EWD: Three-Component Strategy to Create and Scale EWD Impact

Electronic-Photonic Educational Design Offerings

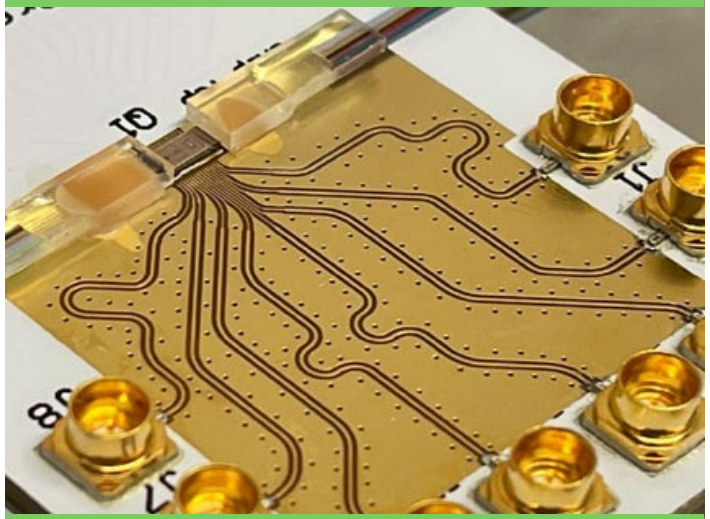


Provide online PIC design and tape-out instruction to industry, government, Department of Defense, and U.S. higher education to build AIM Photonics' MPW user base and critical design know-how in the U.S. PIC industry.

PIC/EPIC Hands-on Training and Engagement

Carry out face-to-face training using AIM Photonics partner facilities to build key hands-on skills in PIC design, PIC fabrication, testing and integration, and PIC packaging.

PIC/EPIC Educational Consortia



Construct regional and national consortia to deploy AIM Photonics course content and hands-on PIC/EPIC testing capabilities in community colleges, tech colleges and universities.

Acknowledgement

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