

SPECIAL ANNOUNCEMENT

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NSF Awards \$1.2M to AIM Photonics' Partner Institutions

The American Institute for Manufacturing Integrated **Photonics** (AIM Photonics), a public-private partnership headquartered in New York state to advance the nation's photonics manufacturing capabilities, has announced that three National Science Foundation (NSF)-funded grants totaling \$1.2 million will enable collaborative photonics-centered R&D with the Rochester Institute of Technology (RIT), University of California, San Diego (UCSD), and University of Delaware (UD).

"AIM Photonics is thrilled to work with leading academic institutions including RIT, UCSD, and UD on these three separate, NSF-funded projects to collaboratively enable photonics-focused devices and capabilities that can allow for the more efficient identification of materials, as well as enhanced processes for manufacturing complex photonic devices and next-generation computing capabilities," said Michael Liehr, CEO of AIM Photonics.

The NSF awarded RIT \$423,000 as part of the research project titled "PIC: Hybrid Silicon Electronic-Photonic Integrated Neuromorphic Networks." The project will focus on realizing high-performance neural networks that will be integrated onto photonic chips for scalable and efficient architectures that, in tandem with integrated electronics, overcome challenges related to photonic memory and amplification. Applications include offering a hybrid, high-bandwidth computing approach in autonomous systems, information networks, cybersecurity, and robotics.

RIT will work with AIM Photonics to use its leading-edge PIC toolset, located at SUNY Polytechnic Institute in Albany, N.Y., and the AIM Photonics TAP facility in Rochester, N.Y. — the world's first 300-mm open access PIC test, assembly, and packaging (TAP) facility. The project will take place within RIT's Future Photon Initiative (FPI) and Center for Human-Aware AI (CHAI).

The NSF awarded UCSD \$405,000 for research titled "PIC: Mobile in Situ Fourier Transform Spectrometer on a Chip," which will enable UCSD to rapidly prototype and test miniaturized and mobile platform-embedded optical spectrometers that will excel at chemical identification

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The initial design, fabrication, and validation of such a spectrometer on a Si chip have been recently reported in *Nature Communications* (9: 665 [2018]). This effort will continue and culminate with full-scale manufacturing runs at AIM Photonics' foundry at the Albany Nanotech Complex. The integrated chip-scale Fourier transform spectrometer is to be fully CMOS compatible for use in mobile phones and other mobile platforms, with potential impacts in areas ranging from environmental management, medicine, and security.

The NSF awarded UD \$360,000 as part of the research project "PIC: Hybrid Integration of Electro-Optic and Semiconductor Photonic Devices and Circuits with the AIM Photonics Institute." The award will allow UD to work with AIM Photonics to leverage the initiative's expertise and state-of-the-art foundry for the development of new heterogeneous manufacturing processes for photonic devices, using new materials such as lithium niobate (LiNbO₃), which can then be directly integrated with silicon CMOS systems for photonic devices and chip-scale systems.

The UD project aims to realize high-performance RF-photonic devices such as ultrahigh-frequency modulators (>100 GHz) that are used in data networks, high-efficiency chip-scale routers for advanced data centers, and high-power phased array antenna photonic feed networks that are compatible with older and next-generation wireless communications.

AIM Photonics features research, development, and commercialization nodes in Albany at SUNY Polytechnic Institute, and in Rochester, where state-of-the-art equipment and tools are being installed at AIM Photonics' TAP facility.

The initiative also includes an outreach and referral network with the University of Rochester; Rochester Institute of Technology; Columbia University; Massachusetts Institute of Technology; the University of California, Santa Barbara; the University of Arizona; and New York state community colleges. In total, AIM Photonics includes more than 100 signed members, partners, and additional interested collaborators.

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GLOSSARY

photonics

The technology of generating and harnessing light and other forms of radiant energy whose quantum unit is the photon. The science includes light emission. transmission. deflection.

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sophisticated systems. The range of applications of photonics extends from energy generation to detection to communications and...

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