

## A Path from Design to Manufacturing for High Performance Silicon Photonics

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**Abstract:** Silicon-photonic integrated circuits offer new applications from traditional electronic integrated circuits. High speed data communication, sensors, light detection and ranging (LIDAR), and low power interconnects are some of the many areas where photonics will be integral to advance these technologies. Backed by federal and state funding and in collaboration with private partners, the American Institute for Manufacturing Integrated Photonics (AIM Photonics) was founded to facilitate photonics research with a path to manufacturing. AIM Photonics offers a multi-project wafer (MPW) service where participants can design photonic integrated circuits (PIC) using devices from a process design kit (PDK) that is provided through AIM. Access to high performance devices and a state of the art 300 mm fabrication facility at SUNY Polytechnic Institute gives designers an accessible and low risk platform to design, build, and test innovative photonic circuits. Fast turnaround time allows for multiple cycles of learning which can reduce time to market for new technologies. In addition, the 300 mm SUNY Poly fab allows for developed products to quickly transfer to a high volume manufacturing fab, a benefit over other research facilities. Finally, SUNY Polytechnic Institute and AIM are establishing a Test, Assembly, and Packaging (TAP) facility in Rochester NY. TAP is the only domestic 300 mm capable electronic and photonic packaging house, a national resource for the defense community.

**Bio** – Seth A. Kruger earned a B.A. in chemistry at the State University of New York (SUNY) at New Paltz in 2006 and a Ph.D. in nanoscale science at SUNY Albany in 2011. Since 2011 he has worked at the State University of New York Polytechnic Institute (SUNY Poly) as an integration engineer with a focus on 3D and photonic integration. In support of the American Institute for Manufacturing Integrated Photonics (AIM Photonics) he helps develop and fabricate interposers and high performance photonic devices.