

## LightSpeed Photonics' optoelectronics integrated processors solve pressing bandwidth problems across industries

LIGHTSPEED PHOTONICS (LSP) is one of 10 startups from around the world working with the Luminate NY accelerator at NextCorps in downtown Rochester. These companies are helping to write the next chapter in Rochester's history as the world's center for optics, photonics, and imaging (OPI).

Each company in Luminate's cohort 5 received an initial investment of \$100,000 and is participating in the six-month program, which helps the selected companies speed the commercialization of their technologies and businesses. On October 19, at Finals 2022 at the Rochester Riverside Convention Center, they will compete for up to \$2 million in follow-on investment. Funding for the \$25 million program is being provided through Empire State Development's Finger Lakes Forward Upstate Revitalization Initiative.

"LightSpeed Photonics is working hard to create a higher performance, more reliable photonics semiconductor," said Dr. Sujatha Ramanujan, managing director of Luminate. "We're confident that the team's dedication and expertise will help to create computing chips that solve pressing bandwidth problems across industries."

We caught up with Rohin Yeluripati, LightSpeed Photonics' Co-founder and CEO, to discuss how the company is developing optics embedded microprocessors to speed up the data input/output and enhance computing power, resulting in real-time processing of applications.

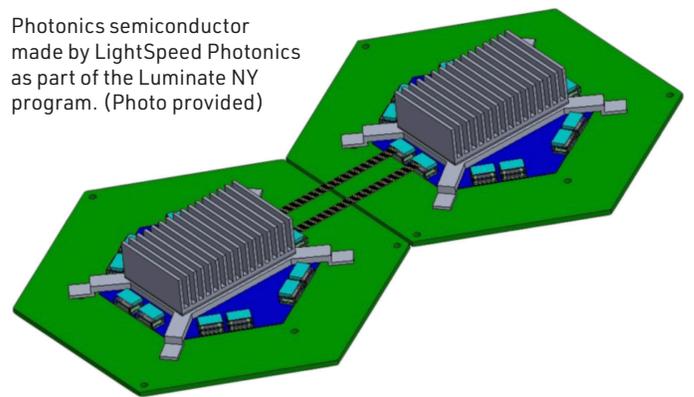


Yeluripati

### Tell us about your company.

LightSpeed Photonics integrates high-performance processors with high data rate optics to create modular processors for data centers and edge cloudlets. Our processors are scalable and field programmable units so that customers can use them for multiple applications, simultaneously. By deploying novel assembly and packaging methods using semi-

Photonic semiconductor made by LightSpeed Photonics as part of the Luminate NY program. (Photo provided)



conductor assembly machines, we increase the data input/output by ten times at much lower power.

This technology addresses the need for increased real-time processing of data bandwidth-intensive applications like video streaming, AI, cybersecurity, and smartNICs (Network Interface Cards).

### Where is your company headquartered?

We are headquartered in Singapore and also have operations in India. Our plans include expanding our business into the U.S.

### Who are the company founders?

The company is managed by two founders. Myself, Rohin Yeluripati, PhD, CEO, and Ramana Pamidighanam, CTO.



Pamidighanam

### How did you and your team develop the concept for your product?

Ramana has been working on board level optical interconnects and electronics-photonics integrated circuits for more than 25 years. I spent my PhD solving high-performance algorithms using programmable hardware

and encountered the difficulties related to data processing and data handling. Together, we brainstormed methods to improve computing and data handling in a frugal electronics setup. These discussions crystalized our concept and we began working to design, process, test and validate, and apply it to customers' needs through various applications.

#### **Why does the world need this product?**

There are considerable applications and market demands pertinent to augmented reality/virtual reality (AR/VR), the Metaverse, content streaming, real-time video analytics, cybersecurity, Industry 4.0, etc. LSP's LightCompute™ will address the data bandwidth needs that are inherent in these applications by enabling real-time computing and multi-terabit data connectivity.

#### **How long have you been working on this technology?**

We've been leveraging our collective 50 years' experience over the last three years to design our product and technology.

#### **Who is the target audience for your product?**

Integrated Device Manufacturers and System Integrators like AMD, Intel, NXP, Dell, and HPE are the target audience for our LightKonnnect™ and LightSiP™ subsystems. It is also of great importance to have support from the edge computer and datacenter chip makers, including Intel-Altera and AMD-Xilinx to help us reach our end users with well-positioned product propositions.

#### **What made you look to Rochester to further your product?**

Mosaic Microsystems is a key partner for us for glass interposer development, which aids high data rate electronic photonic integration on a single substrate with high accuracy fabrication. Rochester has a good base of optical component fabrication that can be a good source for micro optics. In the future, we plan to work with the Rochester Institute of Technology and community colleges like Monroe Community College for optics support.

We were able to find partners and prototyping labs, including labs at the University of Rochester and the Rochester Institute of Technology, that can help us with prototype development. We are hopeful that the Rochester optics community can also help us progress from prototyping to mass production volumes.

#### **Tell us about your experience being in Luminate.**

Luminate is a targeted program that provides startups with vision, direction, and opportunities for funding and market viability. The Luminate team's support is targeted and they invest a sizable amount of time on each cohort member, introducing mentors and organizations that are particularly relevant to each participating company. The Luminate team also helped us in connecting with local companies and investors.

The founders' round table and one-on-one sessions have helped us to better understand market potential, customers, and technical challenges. This has resulted in enhancing our product roadmap to more closely connect with customer needs. Being a Luminate cohort member, we are able to learn complementing technologies from other startups. An additional benefit is that we are working alongside other startups with world-class founders. The peer-learning has been tremendous.

#### **What are you hoping to achieve during your time in Luminate?**

We would like to be known as a photonics semiconductor company and Luminate has given us the platform to reach that goal. We had two main goals in joining the Luminate program – to get our glass substrate-based platform to maturity for our System-in-Package development from local R&D partners like Mosaic Microsystems and AIM Photonics, and to expand our network of decision makers within our potential customer and partner base in the U.S.

In the future, we would like to continue to work with Rochester partners like Corning Glass and GlobalFoundries in releasing the product to the market, in addition to the current partnerships.

#### **If your company wins, what do you plan to do with the follow-on funding?**

LSP's plan is to build the LightSiP with Corning/Mosaic and GlobalFoundries. The primary focus will be to release products to the market with customer pilot engagement. In the process of product release, we would like to leverage the Rochester optics community expertise to expand the scope to the rest of North America.

Computing hardware is a high-volume business and development timelines are shrinking. If we win Finals 2022, we will be able to complete our fundraising target and start working on our plans for establishing product-market fit with customer pilot engagement. This will catapult our development towards scalability.