

Swave Photonics breathes life into augmented reality with true holographic displays

■ Staff

With headquarters in Leuven, Belgium and Silicon Valley, California, fabless semiconductor startup Swave Photonics is on a mission to revolutionize the world of Augmented Reality (AR) by enabling manufacturers of mobile phones and displays to create immersive, life-like, true holographic displays.



Mike Noonan

The company is one of 10 startups from around the world working with the Luminate NY accelerator at NextCorps in downtown Rochester to speed the commercialization of its technology and advance its business.

We caught up with Mike Noonan, CEO of Swave, to learn more about how the company harnesses the power of photonics to transform the digital world with truly realistic 3D experiences.

Overcoming the current challenges of AR with Swave's Holographic eXtended Reality Technology

Augmented reality has the potential to add tremendous value to how we live, work and play, yet solutions, including displays and headsets for everything from video conferencing to gaming, have faced numerous hurdles. For one, they do not behave in the way the human eye expects, which can quickly cause viewers discomfort and fatigue. The solutions and applications are also complex, expensive, and are not user friendly, which has hindered their development and adoption.

A decade of research from imec, the world's leading nano-electronic research and innovation hub, identified holography, ultimate 3D visualization technology, as the optimal solution to overcome the challenges of existing AR solutions. It identified that materials commonly used in semiconductor memories could be used to create true, dynamic holograms that are both economical and easy to scale.

With imec's support, Theo Marescaux and Dmitri Choutov founded Swave Photonics in 2022 to develop and productize the 3D holography technology. The company's Holographic eXtended Reality (HXR) technology will deliver lifelike, high-resolution 3D images that are viewable with the naked eye without the ergonomic or economical constraints of prior applications.

"Swave's technology will simplify AR glasses and headsets, offering immersive spatial experiences with remarkable resolution, perfect depth of focus, and 180-degree to 360-degree viewing angles, without the conventional discomforts associated with traditional headsets," said Noonan. "Applications powered by our HXR gigapixel technology will make Augmented Reality images nearly indistinguishable from real-world images."

Swave's HXR technology has the world's smallest pixels, an order of magnitude smaller than any other technology. This photonics breakthrough makes true holography possible for the first time. Not only will this improve AR glasses; it will make applications that have only been seen in science fiction movies, such as glasses-free 3D displays, a reality.

Looking ahead: The future of Swave

Noonan predicts that Swave technology and resulting products will impact numerous markets, including communications, entertainment, gaming, advertising, automotive, medical and defense. The first applications on the startup's roadmap are enhanced heads-up displays for automotive technologies and augmented reality glasses as a "second screen" for mobile phones.

As the exclusive licensee for the holographic technology developed at imec and with a substantial round of seed funding to fuel its growth, Swave is further along in its development than most startups. It's looking to benefit from Luminate's network of strategic partners to accelerate an ecosystem that supports true holography and raise a series A investment to scale business, create new solutions for immersive displays that do not require glasses or goggles, and scale its team and design capabilities to engage more customers and partners.

"We're confident that the progress Swave has made during its time in the Luminate program is indicative of a strong and successful business," said Dr. Sujatha Ramanujan, managing director of Luminate. "With hard work and the team's unique expertise in both photonics and semiconductors, the company is well positioned to revolutionize the virtual world."

For more information, visit swave.io. To get updates on Luminate and all the emerging technologies being developed in Rochester, go to luminate.org.