

Multiphoton Optics brings "disruptive" optical interconnect technology to market

Multiphoton Optics, a brand new German company with technology that's been in development for more than 12 years, creates 3D nano- and microstructures in different materials for use in 3D optical waveguides and other applications, and benefit from COWIN support.

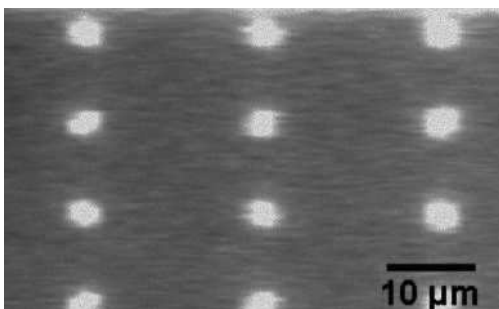
Entrepreneurs Markus Riester, CEO, and Ruth Houbertz, CTO, founded the company in September 2013 and actually began working on its technology development back in 2001. The company is working with COWIN, part of a European Commission effort to help technology-based startups launch and thrive within Europe.

Timing is everything

In some cases, like this one, the timing involved in launching a company really is everything. Until recently, active optical cable technology was not even on the industry's radar. Now, it's on their roadmap. "We're seeing a huge change in the perception of what optics can do for big data centers and supercomputing technology," says Riester.

Active optical cables emerged in supercomputing applications only within the past 3 to 5 years. Currently, optical cables are used on the backplane of supercomputers, but within a couple of years the optical interface is expected to shift inside, on-board and even on-chip.

"This will make a real difference in terms of integration and is where Multiphoton Optics' optical interconnect technology will become really important," says Regis Hamelin, COWIN partner, supporting Multiphoton Optics in business development and fundraising.



Graded index waveguide array, fabricated by TPA lithography, using one hybrid polymer material. Waveguide diameter is $\sim 5 \mu\text{m}$.
R. Houbertz, S. Steenhusen, and T. Grunemann, SPIE Green Photonics Award in Optical Communication (2013)

The company's technology development began back in 2001, and its first demonstration took place in 2005. The technology has been further developed in the FP7 NMP project "METACHEN" since September 2009. Riester and Houbertz realized that at some future point there would be a need for equipment that could manufacture the technology in a real production setting. They waited for the right timing to launch their company—now.

The market for LEDs in optical cables

Multiphoton Optics provides a technology for optically coupling devices, points out Hamelin. "To inject light into the fiber optics from either an LED or laser, you'd need to adapt the optical output of the component to the input of the optical fiber. Today, we use lenses and other optical components to do that. But Multiphoton Optics' technology enables you to create a much easier integration between a light emitter or a light transceiver and an optical fiber," he explains.

"We have inherent high-precision alignment, which is something the standard method of creating optical waveguides lacks. Our technology can go to 3D, which is a capability that sets us apart from the rest of the market," says Dr Markus Riester.

Differentiation

The main way Multiphoton Optics differentiates itself is by eliminating 70 % of the process steps usually required to create optical waveguides—dropping from more than 20 process steps to a mere 4.

Multiphoton Optics' technology's four simple steps involve: dispensing an optical material over a component, curing the material, writing your waveguide, and then a doing a final cure.

Multiphoton
Optics



Dr. Markus Riester,
CEO, Multiphoton Optics