

Local Start-Up Dynamic Photonics, Inc., Developing Technology for High-Speed Fiber-Optic Networks



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In recent years, network bandwidth requirements have grown exponentially, pushing the need for the development of data exchange mechanisms to 100+ Gbps (gigabits per second). Internet exchanges, high-performance computing, and personalized content such as YouTube, IPTV, and HDTV are a few of the numerous applications that need such high bandwidth capabilities.

To meet the demands of the exponential growth in video, voice, data, and mobile-device traffic over the Internet, the trillion-dollar telecommunication industry needs higher bit rates for fast, distortion-free, low-cost data transfer and has been moving toward 25-Gbps, 40-Gbps and 100-Gbps protocols for their core fiber-optic networks alongside existing 10-Gbps infrastructure. Operations at such high speeds require highly sensitive and cost-effective optical detectors, such as avalanche photodiodes (APDs). To date, there are no commercial APDs available for 25-Gbps+ communication systems.

Local start-up company Dynamic Photonics, Inc., is commercializing a technology developed at the University of New Mexico that could make high-speed, distortion-free, low-cost networks a reality. The technology, called a dynamic-bias-enhanced avalanche photodiode (DBE-APD), uses off-the-shelf avalanche photodetectors (APDs) for a new circuitry process that will enable receivers to transmit at speeds four to five times faster than receivers currently on the market. In 2013, the technology received gap funding from STC's gap fund to develop the technology. The technology also garnered the attention of the investor group New Mexico Angels. The Angels optioned the technology from STC and spun out Dynamic Photonics, Inc., through its Start-Up Factory in 2013 with the goal of achieving proof of concept and building a demonstration model.

The UNM technology is the company's core innovation and was developed by Professor Majeed Hayat and Associate Professor Payman Zarkesh-Ha from

Dynamic Photonics

the Department of Electrical & Computer Engineering and the Center for High Technology Materials, along with co-inventors Luke Lester, Sanjay Krishna, David Ramirez, and John David. Hayat serves as the company's Chief Technology Officer and Zarkesh-Ha as its Vice President for Engineering. CEO Robert Efrogmson debut the technology at the Optical Fiber Communication Conference and Exposition in March 2015.

STC CEO Lisa Kuuttilla is pleased that the technology has attracted commercial interest. "The University of New Mexico has specialized research centers for photonics and optics research and technology development that are among the best in the country and the basis for a growing photonics and optics technology cluster in New Mexico. Drs. Hayat and Zarkesh-Ha are outstanding inventors in this area," she said.

APDs are highly sensitive semiconductor electronic devices that convert light to electricity and are based upon the observation that many metals emit electrons when light shines upon them, producing a photoelectric effect. The DBE-APD technology means that current APDs operable in a 10-Gbps system could be operable in a 25-Gbps+ system using the enhanced higher bandwidth. Another key feature of the DBE-APD technology is that it is "detector-agnostic," which means the method can be applied to any APD and any wavelength. The technology allows any APD receiver to operate at higher rates, beyond the so-called build-up time limit, with far less distortion and can be used for many applications that demand high-speed detection. Dynamic Photonics' technology could replace the bulky receivers presently used at a fraction of the cost.

The company is looking for strategic partners to move the technology to market, such as semiconductor or optical communication companies that develop or use highly sensitive APDs or consulting groups with experience in developing technologies into products for the market.

About Dynamic Photonics, Inc.

Dynamic Photonics Inc. (DPI) enables optical communication to go faster, and reach further, while using less energy and taking up less space. Our technology improves the sensitivity of Avalanche Photodiodes (APDs) by up to 6db, which translates into a doubling of performance, when measured by speed, and even greater improvements when measured by distance. Visit the company's website at <http://www.dynamic-photonics.com/>. ▲