

AB Photonics is bringing ultrafast lasers to the palm of your hand

For years, ultrafast mode-locked lasers have been the gold standard for high-precision applications like molecular analysis, advanced biological imaging, and microscopic material processing. These specialized instruments act like ultra-high-speed strobe lights, emitting light in hyper-fast, microscopic pulses. This unique pulsing allows industries to scan, cut, or analyze delicate materials such as pharmaceutical compounds or microelectronics with extreme precision and zero heat damage. Yet, for original equipment manufacturers (OEMs) trying to integrate these powerful optical tools into



AB Photonics co-founder & CEO
Faisal R Ahmad, PhD

commercial products, adoption has been nearly impossible because the hardware is bulky, expensive, and notoriously difficult to scale.

“Our team had worked at a number of biotech startups, and we found that trying to integrate a mode-locked laser was almost unachievable,” explains Faisal R Ahmad, PhD, co-founder and CEO of

AB Photonics. “We talked to many laser suppliers, and they always highlighted that the combination of skilled workers and complicated supply chains that are needed to scale this class of lasers is very challenging. Based on this reality and our own experience, we recognized this as a problem that needed to be solved.”

The urgency to fix this bottleneck intensified during the global pandemic, when supply chain disruptions brought entire manufacturing lines to a sudden halt.

A HIGH-POWERED LASER YOU CAN HOLD

To ensure that the next generation of customers didn’t experience pains like these, AB Photonics



AB Photonics co-founders: Faisal R Ahmad, PhD; Pat Adcock; and Michael Bellos, PhD. (Photo provided by AB Photonics)

has spent the past three years completely altering the economics of laser deployment. The startup has engineered a compact pulsed mode-locked laser that a user can literally hold in the palm of their hand. By utilizing proprietary manufacturing technology, the company has automated and simplified the assembly process, making it significantly easier to manufacture, deploy, and ship.

While traditional industrial laser units are heavy and oversized, resulting in high shipping costs that are ultimately borne by the buyer, AB Photonics’ palm-sized design slashes these logistics expenses and allows the laser to integrate seamlessly into a customer’s existing equipment.

“Our technology offers a totally new approach to laser manufacturing,” Ahmad says. “OEM customers or even researchers who have been unable to find a good pulsed laser for their applications now have an option that can not only save them time and money, but unlock opportunities for creating new products and applications.”



The latest Pulsera mode-locked lasers that were designed and manufactured in Guilford, CT. (Photo provided by AB Photonics)

NAVIGATING THE COMMERCIALIZATION RUNWAY

While the company founders—including Ahmad, Chief Technology Officer Michael A. Bellos, PhD, and Chief Operating Officer Pat Adcock—excel at complex optical physics, they recognize that scaling a hardware startup requires a different kind of operational expertise. To bridge the gap between scientific innovation and commercial execution, the team looked for outside business guidance. After discovering Luminate NY at the Photonics West trade show this past January, they decided to apply.

“The Luminate accelerator was built to support startups just like AB Photonics that are focused entirely on photonics and optical technology,” shares Ahmad. “Since we are a group of only engineers and scientists, we’ve been concentrating primarily on building our technology. But we also need to learn the various aspects of creating a scalable, strong business. The fact that we have a whole range of mentors helping us in our journey is something that money cannot buy.”

In addition to providing an initial investment of \$100,000, Luminate has offered concentrated regional support and hands-on guidance that’s already yielded tangible milestones. AB Photonics recently manufactured the very first batch of production lasers, which will be used by customers in its early-access program. “This would not have been possible without Luminate,” Ahmad acknowledges.

WHERE THE TECHNOLOGY IS HEADED NEXT

Over the next six to twelve months, AB Photonics will transition from early production to active market expansion. The company’s immediate commercial target is the Raman spectroscopy industry—a highly precise analytical market for identifying chemical compositions and molecular structures.

From there, the startup plans to leverage its adaptable platform to expand into completely untapped markets, focusing on the development of ultraviolet (UV) and semiconductor lasers to open new revenue streams. “Our products are being designed from the outset to be scalable and manufacturable. We have made important advances in how to assemble and align these complicated lasers, and this simplifies the manufacturing process—these benefits will be of value to multiple markets,” says Adcock.

To fund this strategic roadmap and secure a growing customer base, the company is actively raising a seed round and preparing to compete for a portion of \$2 million in follow-on funding at Luminate Finals on September 30. Being awarded additional monies from Luminate—made possible by Empire State Development’s Finger Lakes Forward Upstate Revitalization Initiative—will allow the company to expand its operational footprint and accelerate domestic production.

“Our mission is two-fold: To continuously innovate in optics and opto-mechanics to provide customers with the best compact, user-friendly, ultrafast lasers, and to build a solid foundation for manufacturing advanced lasers here in the United States,” Bellos adds. “If we win Finals, we’d invest heavily in growing our technical team and scaling our manufacturing operations.”

Ultimately, the company aims to transform these high-end, specialized instruments into a universal industrial utility.

“In five to ten years, we believe that pulsed lasers like the ones AB Photonics is working to proliferate will be widely available and will become the common industry baseline, just as standard continuous-wave lasers did before them,” Ahmad concludes.