# Light-based semiconductor chips could be tech's brighter destiny, eventually

Article

**The news:** An increasing number of companies are developing **silicon photonic semiconductor chips** to achieve faster speeds, greater power, and improved efficiency.

The technology could meet the rising need to run modern advanced computing workloads involved in AI, AVs, and other systems that require massive amounts of data to be crunched quickly.

- One company in the photonics space, **Luminous Computing,** has raised **$105 million** in Series A funding, including from **Bill Gates,** and recently divulged plans to build an **AI supercomputer** using light-based technology, [per](#) The Next Platform.

- **Hewlett Packard Enterprise** struck a multi-year strategic collaboration with **Ayar Labs** to harness the startup's silicon photonic tech, which can reportedly achieve **1,000x the bandwidth of electrical I/O circuitry with just one-tenth of the power**, for use in the **HPE Slingshot,** [per](#) ZDNet.

**Lightspeed data processing:** Since **photonic chips use light to transmit data instead of the electrons** used in their conventional counterparts, the technology promises faster, more powerful, and more efficient computers.
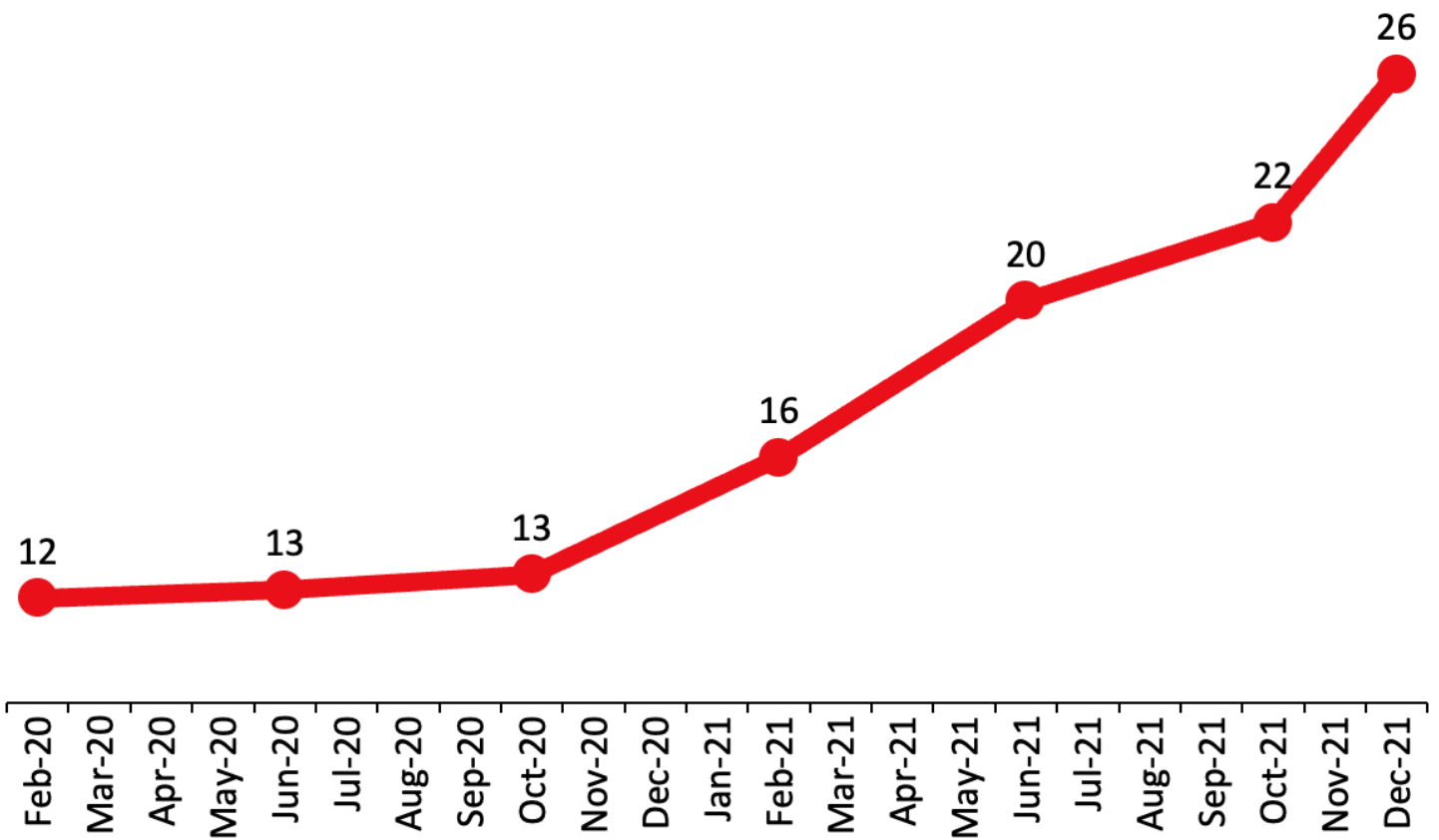
With the drive for innovation increasingly bumping up against data bottlenecks, photonics can advance the most demanding areas of technology like AI, quantum computing, and automation. It could also affect us closer to home with faster IoT and [downloads speeds and higher streaming quality](#).

- According to Luminous CEO **Marcus Gomez,** AI models from a decade ago had **100 million parameters** at most, taking a single computer an hour to train. Today, models have **10 trillion parameters** requiring tens of thousands of machines a year to train—a slowdown that photonics can speed up to just a few days of training.

- Since photonics uses less energy than electronics, it's also being applied to AVs, which have to process large amounts of data from energy-intensive **LiDAR,** radar, and cameras, straining vehicle batteries and reducing range.

- That's why **Harvard** and **Boston University** [partnered](#) with **Lightmatter** to apply its electro-photonic computing solutions to the AV problem.

**What's the catch?** Following two years of supply chain disruptions from the coronavirus pandemic, Russia's [war](#) in Ukraine is another foe for the semiconductor industry. With Ukraine the top supplier of [neon](#) gas—a critical chip component—to the US, the conflict is expected to also affect the photonics sector, which could dampen its outlook.

- Luminous plans to have systems for sale within **24 months**, but that could be pushed back unless steps are taken to reclaim and recycle neon or use it more efficiently.
- Photonics could upend the electronics industry, but its novelty coupled with supply chain challenges might slow adoption.

# Gap Between Ordering a Chip and Delivery
## (In weeks)



| Feb-20 | Mar-20 | Apr-20 | May-20 | Jun-20 | Jul-20 | Aug-20 | Sep-20 | Oct-20 | Nov-20 | Dec-20 | Jan-21 | Feb-21 | Mar-21 | Apr-21 | May-21 | Jun-21 | Jul-21 | Aug-21 | Sep-21 | Oct-21 | Nov-21 | Dec-21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | | | | 13 | | | | 13 | | | | 16 | | | | 20 | | | | 22 | | 26 |

Source: Susquehanna Financial Group, 2022

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