

Higher Performance, Less Energy: Q.ANT Deploys Second-Generation Photonic Processors at Supercomputing Center LRZ

Deployment in one of Europe's leading HPC facilities moves photonic co-processing into rigorous production evaluation to address AI's energy problems

Stuttgart, Germany – March 17, 2026 – [Q.ANT](#) today announced the deployment of its second-generation photonic processors in a high-performance computing (HPC) environment at the [Leibniz Supercomputing Center \(LRZ\)](#). This deployment marks an important step toward integrating light-based co-processing into production data center operations to reduce the escalating energy and performance constraints of AI workloads. Photonic computing architectures can enable up to 90x lower power consumption per workload and up to 100x greater data center capacity, driven by higher computational density and increased calculation speed.

Building on its first-generation system at LRZ, Q.ANT's Gen 2 Native Processing Units (NPU) act as photonic AI accelerators, delivering higher computational throughput and improved energy efficiency. Installed via standard PCIe interfaces, the processors integrate into existing HPC systems and operate alongside CPUs and GPUs under AI and scientific simulation workloads.

"AI is pushing data center power consumption to unprecedented levels, and energy has become a major limiting factor in scaling next-generation computing infrastructure," said Bob Sorensen, Hyperion Research's Senior Vice President for Research. "What makes this deployment significant is that it moves photonic co-processing beyond proof-of-concept and into production HPC environments. Demonstrating measurable energy reduction and performance gains under real-world workloads signals that alternative architectures like photonics are becoming a practical path forward for scaling AI infrastructure."

In benchmark evaluations at LRZ, Q.ANT's Gen 2 architecture demonstrated significant improvements over its first-generation NPUs, marking the next milestone in the company's aggressive product development roadmap. Results include:

- More than 50x higher throughput of matrix multiplications
- 25x faster inference on a ResNet-18 convolutional neural network
- 6x lower energy consumption for typical workloads
- Enhanced analog units optimized for nonlinear functions, reducing parameter counts and training depth
- Accuracy sufficient to support state-of-the-art AI applications

Unlike electronic processors that rely on transistor switching, Q.ANT's photonic NPUs execute mathematical operations directly in the optical domain using Thin-Film Lithium

Niobate (TFLN) photonic integrated circuits, eliminating on-chip heat generation and cooling requirements.

“Adding more digital hardware no longer solves the compute scaling problem in AI,” said Dr. Michael Förtsch, CEO of Q.ANT. “If we continue to scale with brute-force transistor logic, we simply turn electricity into heat. At LRZ, we’re proving that light-based co-processing can integrate with today’s infrastructure and deliver measurable efficiency gains under real workloads. This is how AI can continue to scale without scaling its energy footprint.”

LRZ runs large-scale scientific simulations, AI research, and data-intensive applications under the most demanding operational standards. The installation enables LRZ to rigorously test photonic co-processing under production conditions, benchmarking performance, precision and energy efficiency within heterogeneous HPC architectures.

“This deployment highlights the technological progress from the first to the second generation of Q.ANT’s processors,” said Prof. Dr. Dieter Kranzlmüller, Chairman of the Board of Directors of LRZ. “Our evaluation is conducted under real production workloads and operational requirements. Photonic co-processing represents a promising approach to addressing the performance and energy challenges increasingly defining modern high-performance computing.”

The LRZ installation helps tackle industrial challenges in compute-intensive applications such as drug discovery, materials design, and adaptive optimization, where nonlinear complexity and energy efficiency are critical. The collaboration was supported by funding from the German Federal Ministry of Research, Technology and Space.

About The Leibniz Supercomputing Centre (LRZ)

The Leibniz Supercomputing Centre (LRZ) is a leading European high-performance computing facility serving universities and research institutions across Bavaria and Germany. As a member of Germany’s Gauss Centre for Supercomputing (GCS), LRZ provides large-scale computing infrastructure supporting scientific research, AI development, and data-intensive applications.

About Q.ANT

Q.ANT is a Stuttgart-based photonics company developing photonic AI accelerators for AI and high-performance computing HPC, delivering a scalable alternative to transistor-based systems. Its Native Processing Units (NPUs) use Thin-Film Lithium Niobate photonic integrated circuits to perform mathematical operations directly in the optical domain, enabling energy-efficient co-processing for complex computational workloads. Q.ANT operates its own TFLN chip pilot line in collaboration with IMS CHIPS.

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Images and captions:

High resolution images can be downloaded from here: [Q.ANT LRZ Images 07.22.25](#)



An LRZ engineer working with Q.ANT's second Generation photonic processor
(Image: LRZ / Veronika Hohenegger)



Q.ANT's second generation processor
(Image: Q.ANT GmbH)

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