



Xanadu and AMD launch Backline to streamline CPU, GPU, FPGA integration for quantum technology

September 10, 2026

Xanadu and AMD open-source Backline, expanding PennyLane to bridge quantum processors with classical hardware engines. This open platform provides an accessible framework for quantum-classical integration across the developer ecosystem.

TORONTO, Sept. 10, 2026 (GLOBE NEWSWIRE) -- Xanadu Quantum Technologies Limited ("[Xanadu](#)"; NASDAQ/TSX: XNDU), a leading photonic quantum computing company, in collaboration with AMD today announced the release of [Backline](#), an open-platform solution, co-designed by Xanadu and AMD, for rapid communications between quantum and classical computing hardware. Backline is built using Xanadu's open-source PennyLane software platform to solve one of quantum technology's most pressing challenges: how to establish ultra-low-latency communication between classical processors and quantum hardware.

Today, quantum devices cannot operate in isolation. To operate effectively, quantum computers are expected to rely on classical hardware, such as GPUs, CPUs, and FPGAs, to shuttle massive streams of data back and forth between components within microseconds. While this ultra-fast, real-time communication is essential for applications such as quantum error correction (QEC), optical network routing, and high-speed sensing, establishing these links has historically limited developer agility by forcing teams into rigid, low-level software frameworks and vendor-locked classical hardware.

Backline reframes the quantum-classical boundary as a heterogeneous computing problem, treating a quantum processor as one more node in a high-performance distributed network. The solution seeks to provide researchers and hardware developers low-level hardware control directly through PennyLane's high-level Python interface. This opens a new design space for hybrid classical/quantum systems, enabling teams to execute ultra-low-latency communication loops between classical and quantum hardware without compromising developer agility or risking vendor lock-in.

Key highlights of Backline include:

- **Sub-3 Microsecond Latency:** Achieves end-to-end classical-quantum loop times under 3 microseconds¹, delivering ultra-fast data links to support quantum error correction, real-time network signal processing, and high-speed sensing.
- **CPU-Friendly Infrastructure:** Demonstrates that standard processors, such as AMD EPYC™ or Threadripper™ CPUs can handle low-latency demands out of the box. Teams can deploy real-time feedback loops without relying on enterprise GPUs or specialized servers, democratizing access to a wide range of classical hardware.
- **Open & Hardware-Agnostic Design:** Built within open-source software (Xanadu's PennyLane platform), Backline connects standard CPUs, adaptive FPGAs, and GPUs seamlessly without vendor lock-in. The PennyLane platform provides users with an accessible entry point through Python programming and enabling compilation to translate those programs for rapid communication between hardware components.

"Quantum processors require ultra-fast classical infrastructure, operating behind the scenes," said Dr. Christian Weedbrook, Founder and Chief Executive Officer of Xanadu. "By integrating Backline into PennyLane, we are providing direct access to the communication layers that the industry needs to move from laboratory R&D to real-world performance. Our work with AMD shows that AMD's hardware can handle these demanding latency budgets right now, even with standard CPUs, bringing useful quantum computing closer to reality."

"Quantum computers never run alone. Every useful quantum system depends on classical compute reacting in microseconds, and that is a heterogeneous computing problem AMD is uniquely built to solve," said Scott Tease, Corporate Vice President, HPC and Sovereign AI, AMD. "We co-designed Backline with Xanadu so a single Python program can span AMD EPYC and Threadripper CPUs, AMD Instinct GPUs, AMD Versal FPGAs and AMD Pensando networking, and route every task to the engine that meets its latency budget. That gives the whole quantum ecosystem an open path from research to production, on hardware developers can use today."

For the broader quantum industry, Backline marks a decisive shift away from high-cost, proprietary hardware lock-in toward an accessible, production-ready ecosystem. By dramatically lowering the barrier to entry, PennyLane now provides a universal software foundation for connecting quantum and classical hardware. This enables university researchers, enterprise engineers, and hardware manufacturers the ability to rapidly prototype and deploy fault-tolerant quantum technologies, without rebuilding their

classical infrastructure from the ground up. In doing so, Backline bridges the gap between today's classical computing workflows and tomorrow's scalable quantum technologies.

Backline is available today as an open-source feature suite within the PennyLane open-source platform.

About Xanadu

Founded in 2016, Xanadu is a Canadian photonic quantum computing company with the mission to build quantum computers that are useful and available to people everywhere. Xanadu is building fault-tolerant quantum computers using light, with systems designed to compute at room temperature. Xanadu develops both hardware and software, including [PennyLane](#), its open-source quantum computing platform. Xanadu is the first pure-play photonic quantum computing company to list on public markets (Nasdaq/TSX: XNDU) and is recognized globally for its breakthroughs in scalable quantum technologies. Visit xanadu.ai or follow on X [@XanaduAI](#).

Contacts

Press Contact:

press@xanadu.ai

Investor Relations:

investors@xanadu.ai

Forward-Looking Statements

This communication includes "forward-looking statements" within the meaning of the U.S. federal securities laws and "forward-looking information" within the meaning of applicable Canadian securities laws (collectively, "forward-looking statements"). Forward-looking statements may be identified by the use of words such as "estimate," "plan," "project," "forecast," "intend," "will," "expect," "anticipate," "believe," "seek," "target," "continue," "could," "may," "might," "possible," "potential," "predict" or similar expressions that predict or indicate future events or trends or that are not statements of historical matters. We have based these forward-looking statements on current expectations and projections about future events. These statements include: the expected capabilities, performance, and latency metrics of Backline, including its ability to achieve sub-3 microsecond latency; the ability of Backline to establish ultra-low-latency communication links between classical hardware and quantum processors; the expected benefits and adoption of Backline by researchers, hardware developers, enterprise engineers, and classical/quantum computing innovators; the ability of standard classical hardware (including AMD EPYC™, Threadripper™, Instinct GPUs, Versal FPGAs, and Pensando networking) to support high-speed feedback loops and heterogeneous computing demands without reliance on specialized enterprise servers; the ability of Backline, PennyLane, and Catalyst to democratize access to quantum infrastructure, remove software and hardware vendor lock-in, and lower barriers to entry for the broader quantum ecosystem; the expected advancement of Xanadu's software and hardware roadmaps toward commercial performance, fault-tolerant quantum computing, and scalable quantum data centres; and Xanadu's mission to build quantum computers that are useful and available to people everywhere.

These forward-looking statements are provided for illustrative purposes only and are not intended to serve as, and must not be relied on as, a guarantee, an assurance, a prediction or a definitive statement of fact or probability. Actual events and circumstances are difficult or impossible to predict and will differ from assumptions, many of which are beyond the control of Xanadu. These forward-looking statements are subject to known and unknown risks, uncertainties and assumptions that may cause the actual results of Xanadu, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by such statements. Such risks and uncertainties include: the risk that Backline may not achieve expected performance levels, microsecond latency budgets, or widespread industry adoption; technical challenges in integrating quantum software interfaces with third-party classical processors, GPUs, FPGAs, and network links; risks related to Xanadu's collaboration with AMD and reliance on third-party hardware manufacturers, software platforms, and open-source ecosystems; that Xanadu is pursuing an emerging technology, faces significant technical challenges and may not achieve commercialization or market acceptance; Xanadu's historical net losses and limited operating history; that there is substantial doubt about Xanadu's ability to continue as a going concern; Xanadu's expectations regarding future financial performance, capital requirements and unit economics; Xanadu's use and reporting of business and operational metrics; Xanadu's competitive landscape; Xanadu's dependence on members of its senior management and its ability to attract and retain qualified personnel; the potential need for additional future financing; Xanadu's ability to manage growth and expand its operations; potential future acquisitions or investments in companies, products, services or technologies; Xanadu's reliance on strategic partners and other third parties; Xanadu's concentration of revenue in contracts with government or state-funded entities; Xanadu's ability to maintain, protect and defend its intellectual property rights; risks associated with privacy, data protection or cybersecurity incidents and related regulations; the use, rate of adoption, and regulation of artificial intelligence and machine learning; uncertainty or changes with respect to laws and regulations; uncertainty or changes with respect to taxes, trade conditions and the macroeconomic environment; material weaknesses in Xanadu's internal control over financial reporting and its ability to maintain internal control over financial reporting and operate as a public company; the outcome of any legal proceedings or government investigations that may be commenced against Xanadu; Xanadu's ability to issue equity or equity-linked securities in the future; and other factors described in Xanadu's filings with the SEC (www.sec.gov) and the Canadian Securities Administrators (www.sedarplus.com). These forward-looking statements are based on certain assumptions, including that none of the risks

identified above materialize; that there are no unforeseen changes to economic and market conditions, and that no significant events occur outside the ordinary course of business. Additional information concerning these and other factors that may impact such forward-looking statements can be found in filings and potential filings by Xanadu with the SEC and the Canadian Securities Administrators, including under the heading "Risk Factors." If any of these risks materialize or assumptions prove incorrect, actual results could differ materially from the results implied by these forward-looking statements. In addition, these statements reflect the expectations, plans and forecasts of Xanadu's management as of the date of this communication; subsequent events and developments may cause their assessments to change. While Xanadu may elect to update these forward-looking statements at some point in the future, they specifically disclaim any obligation to do so, unless required by applicable securities laws. Accordingly, undue reliance should not be placed upon these statements.

In addition, statements that "we believe" and similar statements reflect our beliefs and opinions on the relevant subject. These statements are based upon information available to us as of the date of this communication, and while we believe such information forms a reasonable basis for such statements, such information may be limited or incomplete, and our statements should not be read to indicate that we have conducted an exhaustive inquiry into, or review of, all potentially available relevant information. These statements are inherently uncertain and investors are cautioned not to unduly rely upon these statements.

¹ Unless stated otherwise, AMD has not tested or verified the third-party claims found herein