

ORCA Computing launches PT-3, the first quantum computer built for commercial quantum advantage

PT-3 runs alongside NVIDIA accelerated computing at Digital Realty's Innovation Lab in London, delivering results in AI for science and industrial optimisation

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/EINPresswire.com/ -- - World's largest hybrid quantum-classical generative AI model for science: extension of [NVIDIA Proteína](#) protein-design model outperforms the classical baseline at identifying novel protein structures, improving the ratio of useful proteins by 20%.

- Industrial-scale energy optimisation: the PT-3 accelerates JIJ's hybrid quantum-classical workflow on a 25,755-variable unit commitment benchmark, delivering solution quality competitive with leading commercial optimisation solver.

- Built for commercial quantum advantage: modular and upgradeable in the field, so performance grows with every upgrade. It operates at room temperature, uses 6 kW across two standard racks and is operational within hours of installation.



PT-3 deployed in Digital Realty's Innovation Lab

[ORCA Computing](#), the company pioneering quantum-accelerated AI for science, today launches the PT-3, the newest generation of its photonic quantum computers, and the first built to deliver commercial quantum advantage. The first system is live in the Digital Realty Innovation Lab (DRIL) in London, where it runs alongside NVIDIA accelerated computing.

Quantum and AI for science

AI for science, harnessing AI to transform scientific discovery, is rapidly emerging as one of the most important new categories in computing and a major industry-wide focus, yet it is held back by limited training data. ORCA's PT-3 works alongside GPUs to increase the expressivity of AI models (their ability to represent complex patterns and data distributions), helping them learn

more from limited data and identify better, more novel candidates for new drugs and materials.

Already delivering results

The PT-3 has allowed ORCA to generate results from a hybrid quantum-classical extension of NVIDIA Proteína, the generative model for protein design. Trained on 32 [NVIDIA Hopper GPUs](#) working with a PT-3 using 64 photons in 128 qumodes, the hybrid model showed enhanced designability over the classical baseline, improving the ratio of useful proteins by 20%, and generated novel proteins with a different mix of secondary structures.

This builds on earlier life sciences results from ORCA's PT-2 system. Working with the Technical University of Denmark, the PT-2 produced around twice as many strong peptide binders as classical AI, validated in the wet lab. It also generated 49% more valid, unique molecules on the QM9 benchmark*.

The PT-3 is also being applied to optimisation problems such as smarter energy scheduling. Earlier this year, JIJ Inc. and ORCA, in collaboration with bp and the UK's National Quantum Computing Centre (NQCC), published a white paper that benchmarked hybrid approaches to the unit commitment problem. On that 25,755-variable benchmark, ORCA's PT-3 now runs the hybrid quantum-classical workflow in about an hour, more than 12× faster than its predecessor at the same solution quality. In the white paper's testing, the hybrid solver's results were competitive with the industry-standard commercial optimisation solver on solution quality and, with more runtime, found the best solutions of any method tested.

Richard Murray, Co-founder and CEO of ORCA Computing, said: "By integrating our photonic quantum computer with NVIDIA accelerated computing, we have taken a critical first step in the future of hybrid quantum supercomputing. The PT-3 is already delivering results in AI for science and industrial optimisation, from protein design to energy scheduling. Through Digital Realty, enterprise users can now put it to work on their most challenging workloads, and customers are trialling use cases in life sciences, defence, energy and logistics. The PT-3 is built to scale: it upgrades in the field, so customers who start today keep building on the same system."

"With the PT-3, ORCA is bringing photonic quantum computing and NVIDIA accelerated computing together in a system researchers can use to develop and test new applications," said Sam Stanwyck, Director of Quantum Product at NVIDIA. "The value of a computing platform is in what researchers build on it. ORCA's extension of NVIDIA's Proteína model to generate a different range of protein structures with improved designability is a great example of what can be accomplished when these tools come together."

"Our partnership with ORCA reflects a shared ambition to make quantum computing practical for business. Hosting the PT-3 in the DRIL gives us a real-world environment to explore how quantum can deliver value today, and it's a significant step towards commercial quantum

advantage at scale,” said Séamus Dunne, Managing Director, UK & Ireland, Digital Realty,

Richard Murray and the ORCA team are available for interview at NVIDIA GTC Berlin, 20-22 October 2026, at booth 7083 in the Inception showcase.

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*The QM9 benchmark is a foundational dataset and standard testbed in quantum chemistry and molecular machine learning used to train and evaluate predictive models.

About ORCA Computing

Spun out of the University of Oxford in 2019 and built on three decades of photonics research, ORCA puts quantum computing to work on real industrial problems. Its hybrid quantum-classical approach takes on workloads where classical computing hits its limits.

ORCA was the first quantum company to put a quantum computer into a data centre in 2022, and the first to deliver a hybrid quantum solution into a customer data centre alongside NVIDIA GPUs in 2024. With the PT-3, that work moves from proving quantum can run alongside classical infrastructure to proving what it can deliver for AI.

ORCA works with over 35 customers and partners and has installed 11 PT Series quantum systems in customer data centres across the globe. Its modular, upgradeable systems continue to deliver value as workloads scale, giving early adopters a lasting quantum edge.

ORCA is headquartered in London, with an office in Austin. www.orcacomputing.com

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