

News Release

UOB and Singapore's Centre for Quantum Technologies pioneer quantum computing application in derivatives valuation

Singapore, 1 July 2026 – UOB today announced a collaboration with Singapore's Centre for Quantum Technologies (CQT) to pioneer the application of quantum computing techniques to the valuation of complex financial derivatives.

As financial markets become more volatile, financial derivatives play an increasingly important role in managing financial and market risks. Financial derivatives include instruments such as options, futures and swaps defined for different kinds of assets. Valuing these complex instruments is difficult and poses substantial computational challenges, especially where closed-form pricing methods are highly impractical.

Currently, large-scale simulation methods, such as the Monte Carlo¹ method, are widely used. These simulations run thousands of potential future market scenarios to derive fair values – which can be extremely time- and resource-intensive.

Through this collaboration, UOB and CQT will assess how quantum computing methods could process large volumes of scenarios more efficiently under certain conditions, to achieve faster valuation, improved precision and more scalable approaches to managing derivative risks over time. CQT researchers at the National University of Singapore (NUS) will work on the project with support from the National Quantum Computing Hub.

The initial phase of the project will focus on path-dependent instruments, whose valuations depend on multiple market variables as well as historical price movements. These characteristics make them among the most computationally demanding products to value using traditional methods.

By combining UOB's deep expertise in financial markets and derivatives risk management with CQT's leading research capabilities in quantum algorithms, the collaboration aims to bridge the gap between academic research and real-world financial applications. The partnership reflects a joint commitment to translating advanced technology into practical solutions that can strengthen the resilience and efficiency of the financial system.

Mr Lawrence Goh, Head of Group Technology and Operations, UOB, said, "As financial markets become more complex, the need for faster and more accurate risk modelling continues to grow. By investing early and building a clear deployment roadmap, we are laying the foundation for the next generation of banking capabilities – where research and innovation are translated into practical solutions that strengthen risk management and resilience, catalyse scale, and provide long-term value to our customers."

Dr Patrick Rebentrost, Principal Investigator at CQT and Associate Professor in the NUS Department of Computer Science, said, "We know in theory that quantum computing could help with the difficult task of pricing financial derivatives. The collaboration with UOB is an opportunity to advance that theory into practice, testing our methods against real-world scenarios. We will develop beyond-Monte Carlo quantum techniques that could significantly improve our ability to evaluate complex risk scenarios."

¹ Monte Carlo is a mathematical technique that runs simulations of random samplings to forecast possible outcomes.



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The initiative follows Singapore's National Quantum Strategy announced in 2024 to strengthen Singapore's position as a leading hub in the development and deployment of quantum technologies. CQT and NQCH are both programmes supported under the strategy. NQCH, which has CQT as a member, provides access to quantum computers and drives public-private partnerships in quantum computing.

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About UOB

UOB is a leading Asian bank with a global network in Southeast Asia, Asia Pacific, Europe and North America. Operating through our head office in Singapore and banking subsidiaries in China, Indonesia, Malaysia, Thailand and Vietnam, we have a global network of about 430 branches and offices in 19 markets.

Since its incorporation in 1935, UOB has grown organically and through a series of strategic acquisitions. Today, UOB is rated among the world's top banks: Aa1 by Moody's Investors Service and AA- by both S&P Global Ratings and Fitch Ratings.

For more than nine decades, UOB has adopted a customer-centric approach to create long-term value by staying relevant through its enterprising spirit and doing right by its customers. UOB is focused on building the future of ASEAN – for the people and businesses within, and connecting with, ASEAN.

The Bank connects businesses to opportunities in the region with its unparalleled regional footprint and leverages data and insights to innovate and create personalised banking experiences and solutions catering to each customer's unique needs and evolving preferences. UOB is also committed to help businesses forge a sustainable future, by fostering social inclusiveness, creating positive environmental impact and pursuing economic progress. UOB believes in being a responsible financial services provider and is steadfast in its support of education, children and art, doing right by its communities and stakeholders.

About the Centre for Quantum Technologies, Singapore

The Centre for Quantum Technologies (CQT) is Singapore's flagship national research centre in quantum technologies. Supported under Singapore's National Quantum Strategy, the centre has nodes at partner institutions and coordinates research talent across the country. CQT's partner institutions are universities – the National University of Singapore, Nanyang Technological University, Singapore, and the Singapore University of Technology and Design – and the Agency for Science, Technology and Research.

CQT brings together physicists, computer scientists and engineers to do basic research on quantum physics and to build devices based on quantum phenomena. Experts in this new discipline of quantum technologies are applying their discoveries in computing, communications, and sensing.

For more information, please visit www.cqt.sg

About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 15 colleges, faculties and schools across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established more than 20 NUS Overseas Colleges entrepreneurial hubs around the world.



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Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

For more information on NUS, please visit nus.edu.sg.

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