

Activities

[1] **2026/6/29** (coming soon) - **INTERNATIONAL SYMPOSIUM ON QUANTUM AI & THE FUTURE OF LIFE (ISQAI-FoL)**

The International Symposium on Quantum AI and the Future of Life aims to create an interdisciplinary platform for thought leaders, practitioners, and researchers from diverse fields to explore the transformative potential of quantum computing and artificial intelligence (AI) in shaping the future of human well-being. This event will focus on cutting-edge applications of these groundbreaking technologies across four key domains: Biomedicine & Healthcare, Integrating Traditional Chinese Medicine and Western Medicine, Longevity and Anti-aging, and Life Optimization.

Click [here](#) for more information.

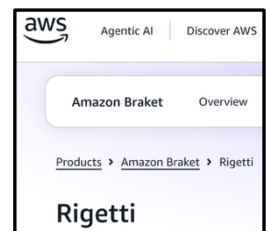


[2] **On May 7, 2026**, AIQRC published an article in the Economic Daily News; the English translation is included in the newsletter. Click [here](#) for the original contents.

[3] **On April 22, 2026**, AIQRC published an article in the Economic Daily News; the English translation is included in the newsletter. Click [here](#) for the original contents.

[4] **On April 8, 2026** AIQRC received approval to use the AWS cloud-based Rigetti Computing quantum computing system.

Click [here](#) for more information



[5] **Feb. 2026** - We recently secured approval for five Ministry of Education-funded programs in Taiwan, creating valuable learning pathways for young people. These programs support international exchange and advanced training at globally recognized universities, helping students build interdisciplinary knowledge, research skills, and global perspectives in fields such as artificial intelligence, quantum computing, biomedical science, systems medicine, and robotics.

Click [here](#) for more information.

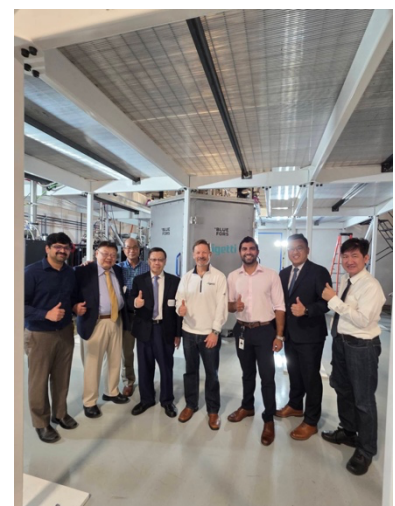
I-9-10	Ⓣ	IBM量子夢：紐約研習營	美國紐約	(九)科技網絡及數位服務	制霸IBM量子科技巔峰	115年7月13日至7月28日，共計16日(含飛行日)
I-9-11	Ⓣ	醫工量子：UCLA 菁英計畫	美國加州洛杉磯	(九)科技網絡及數位服務	探索腦科學與量子計算	115年7月6日至9月3日，共計60日(含飛行日)
I-9-12	Ⓣ	量子金融：赴美職涯領航	美國大紐約區	(九)科技網絡及數位服務	跨足量子與AI金融實務	115年7月6日至8月9日，共計35日(含飛行日)
I-9-13	Ⓣ	AI與石黑浩：探索擬真世界	日本大阪	(九)科技網絡及數位服務	台日共創人形機器人新未來	115年8月1日至116年1月15日，共計168日(含飛行日)
I-9-14	Ⓣ	勇闖WVU：太空機器人實戰	美國摩根敦	(九)科技網絡及數位服務	太空採集機器人見習	115年7月6日至7月23日，共計18日(含飛行日)

[6] **From March 16 to 19**, Asia University’s AIQRC is actively advancing its forward-looking strategy. President Jeffrey J. P. Tsai, Honorary Chairman of AIQRC (third from the right in the photo) and Chair Professor, K.T. Huang, Director of AIQRC (fifth from the right in the photo), recently led a delegation to the United States to visit quantum technology firm Rigetti Computing, where they were hosted by Vice President Mike Piech (fourth from the right in the photo). The visit marks an important step in strengthening the university’s quantum AI strategy, fostering connections with world-class technologies, and building a solid foundation for its vision of becoming an “AI University.”

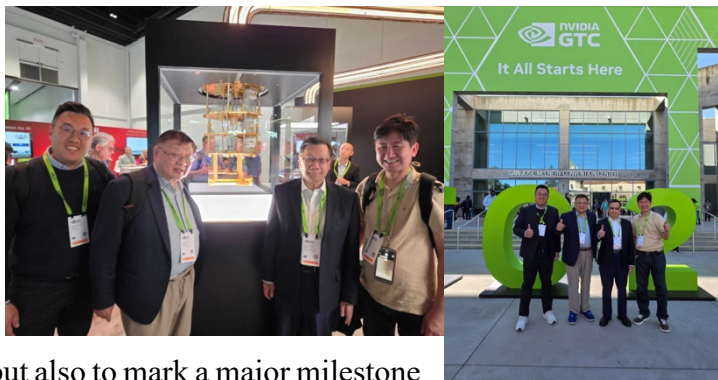


Click [here](#) for more information.

The Asia University delegation conducted an in-depth visit to Rigetti’s laboratories, inspecting hardware facilities and system architectures such as superconducting quantum computers (superconducting qubits), and gaining firsthand insight into the latest technological developments shaping the global quantum industry. President Jeffrey J. P. Tsai, Honorary Chairman of AIQRC (third from the left in the photo), Chair Professor, K.T. Huang, Director of AIQRC (second from the right in the photo) and Rigetti Computing Vice President Mike Piech (fourth from the left in the photo).

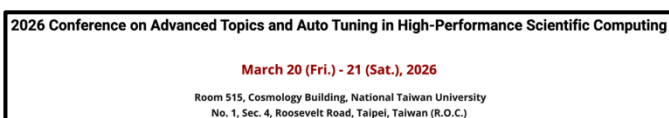


[7] **From March 16 to 19**, President Jeffrey J. P. Tsai, Honorary Chairman of AIQRC (second from the right in the photo), led teams in quantum AI, robotics, and intelligent healthcare to Silicon Valley to attend NVIDIA GTC 2026, the world's premier annual AI conference, and engage with the global AI and semiconductor ecosystem. Tsai emphasized that the visit aimed not only to track cutting-edge technologies, but also to mark a major milestone in advancing Asia University's AI University vision and international collaboration strategy.



Click [here](#) for more information

[8] **On March 20, 2026** Deputy Director of AIQRC, Ka-Lok NG, delivered a presentation titled “Exploring the Potential Advantages of Quantum Machine Learning in Biomedical Research” at the 2026 Conference on Advanced Topics and Auto Tuning in High-Performance Scientific Computing. Click [here](#) for more information.



[9] **Feb. 2026** - We successfully had a proposal accepted for the Fujitsu Quantum Simulator Challenge 2025–26 event.

Announcing the Fujitsu \$100,000 Quantum Simulator Challenge 2025-26

Click [here](#) for more information.

Variational Algorithms in Drug Discovery and Pre-drug Refinement

In modern drug discovery, accurately predicting molecular behavior before experimental validation is essential because laboratory-based screening and optimization are expensive and time-consuming. Classical computational approaches such as molecular docking, molecular dynamics, and QSAR models are widely used to identify and refine drug candidates; however, the complexity of molecular electronic interactions can make highly accurate simulations computationally demanding. Quantum Variational Algorithms (QVAs) are emerging as promising hybrid quantum-classical approaches that may improve molecular simulations and energy estimation in computational chemistry.

Quantum Variational Algorithms (QVAs)

QVAs are hybrid computational methods that combine quantum circuits with classical optimization algorithms to solve quantum chemistry problems on near-term quantum computers. One of the most important QVAs is the Variational Quantum Eigensolver (VQE), which was introduced as a practical method for estimating molecular ground-state energies using short quantum circuits and iterative classical optimization [1]. Unlike fully quantum algorithms that require fault-tolerant quantum computers, VQE is designed for noisy

intermediate-scale quantum (NISQ) devices, making it more suitable for current quantum hardware limitations.

In computational drug discovery, molecular properties such as electronic configuration, binding energy, charge transfer, and reaction stability are fundamentally governed by quantum mechanics. QVAs can therefore assist in modeling molecular systems more accurately than some classical approximations, particularly for chemically complex systems involving strongly correlated electrons or difficult reaction pathways [2].

In pre-drug refinement, QVAs may support the optimization of candidate molecules after virtual screening and docking. After identifying potential compounds, researchers must refine molecular structures to improve efficacy, selectivity, pharmacokinetic properties, and stability while minimizing toxicity. Quantum-enhanced molecular simulations can contribute to this process by improving electronic structure calculations and helping predict molecular interactions more precisely.

Recent studies have demonstrated the application of hybrid quantum-computing workflows in real-world drug-discovery problems. Li et al. developed a hybrid quantum computing pipeline capable of evaluating Gibbs free-energy profiles and covalent interactions in drug molecules, demonstrating the potential of QVAs in medicinal chemistry workflows [3]. Similarly, recent reviews highlight that VQE-based quantum chemistry methods may become important tools for molecular optimization, reaction simulation, and drug-design applications as quantum hardware continues to improve [4], [5].

Although current quantum devices still face challenges such as noise, decoherence, limited qubit counts, and error-correction constraints, QVAs are considered among the most practical near-term quantum algorithms because they minimize circuit depth while leveraging classical optimization methods [6]. Therefore, integrating Quantum Variational Algorithms with existing computational pipelines such as docking, molecular dynamics, artificial intelligence, and QSAR modeling may accelerate pre-drug refinement and improve the identification of promising therapeutic candidates in future drug-discovery research.

References

- [1] A. Peruzzo *et al.*, “A variational eigenvalue solver on a photonic quantum processor,” *Nature Communications* 2014 5:1, vol. 5, no. 1, pp. 4213-, Jul. 2014, doi: 10.1038/ncomms5213.
 - [2] Y. Cao *et al.*, “Quantum Chemistry in the Age of Quantum Computing,” *Chem. Rev.*, vol. 119, no. 19, pp. 10856–10915, Oct. 2019, doi: 10.1021/ACS.CHEMREV.8B00803.
 - [3] W. Li *et al.*, “A hybrid quantum computing pipeline for real world drug discovery,” *Scientific Reports* 2024 14:1, vol. 14, no. 1, pp. 16942-, Jul. 2024, doi: 10.1038/s41598-024-67897-8.
 - [4] J. Tilly *et al.*, “The Variational Quantum Eigensolver: A review of methods and best practices,” *Phys. Rep.*, vol. 986, pp. 1–128, Nov. 2022, doi: 10.1016/j.physrep.2022.08.003.
 - [5] D. A. Fedorov, B. Peng, N. Govind, and Y. Alexeev, “VQE method: a short survey and recent developments,” *Materials Theory* 2021 6:1, vol. 6, no. 1, pp. 2-, Jan. 2022, doi: 10.1186/S41313-021-00032-6.
 - [6] M. Cerezo *et al.*, “Variational quantum algorithms,” *Nature Reviews Physics* 2021 3:9, vol. 3, no. 9, pp. 625–644, Aug. 2021, doi: 10.1038/s42254-021-00348-9.
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