



主辦單位:
華府國建聯誼會
(CAPA-DC)

指導單位:
駐美國台北經濟文化代表處
科技組

ACADEMIC AND INDUSTRIAL QUANTUM COMPUTING CO-OP FORUM

量子電腦產學合作研討會

主持人



葉人豪博士 **Dr. Jen-Hao Yeh**
Electrical Engineer
Rigetti Computing



張慶瑞教授 **Prof. Ching-Ray Chang**
Distinguished Professor
National Taiwan University



謝明修博士 **Dr. Min-Hsiu Hsieh**
Director
Hon Hai Quantum Computing Center



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Assistant Professor, Department of Physics
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IBM Quantum

5/29/21 • 9AM EST | 6AM PST | 9PM TAIWAN

Contact:
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Registration (WebEx Online):
tinyurl.com/capaseminar

華府國建會5/29網上舉辦 「量子電腦產學合作研討會」

【華府國建會新聞稿】

華府國建聯誼會將於5月29日(週六)上午九時(美西上午六時,台灣晚上九時)舉辦「量子電腦產學合作研討會」,駐美國台北經濟文化代表處(TECRO)科技組是指導單位,講員是來自美國和台灣量子領域的專家。

本次研討會邀請美國和台灣量子電腦領域產學界的專家,透過WebEx視訊會議分享發展經驗、交流合作機會。前半場由與會專家分別介紹其專業領域的發展現況,講者有台灣大學張慶瑞教授、中山大學邱奎霖教授、鴻海研究院謝明修所長、美國IBM的姚正邦博士、呂文森博士,主辦單位有二位代表,分別是在加州Rigetti Computing的葉人豪博士及銘傳大學的周澤民教授。演講的內容包括:台灣量子電腦發展現況、量子神經網路、量子材料、美國IBM量子電腦的發展、由量子硬體至量子生力軍。後半場則提供台美雙方的專家互相對話與討論,同時開放與會者對量子電腦的發展提問。

「量子電腦產學合作研討會」精彩可期。報名請至以下鏈結,因網上會議參與人數有限,敬請及早報名。若有任何詢問,請逕與華府國建會會長張慧玲(elainechang999@gmail.com)、華府國建會顧問葉人豪(david.yehjenhao@gmail.com)聯繫。

https://docs.google.com/forms/d/e/1FAIpQLSfC1bUQxw9hIJFMnFnwYIRDNGkzaW7syYjI0Ee_YMpHXG7kVw/viewform



量子電腦產學合作研討會

主辦單位：華府國建聯誼會 (CAPA-DC)

指導單位：駐美國台北經濟文化代表處 科技組

時間：美東時間 2021 年 5 月 29 日上午 9 時 (台灣 5/29 晚上 9 時；美西上午 6 時)

研討會議程 Agenda

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|---------------|--|
| 9:00 – 9:05 | 主持人開場，國建會會長致詞 |
| 9:05 – 9:10 | 駐美代表處與會代表致詞 |
| 9:10 – 9:15 | 主持人介紹
葉人豪博士 Dr. Jen-Hao Yeh
Electrical Engineer, Rigetti Computing (美國) |
| 9:15 – 9:30 | 張慶瑞教授 Prof. Ching-Ray Chang
Professor, Department of Physics, National Taiwan University (台灣)
The Quantum Computing Community in Taiwan |
| 9:30 – 9:45 | 謝明修博士 Dr. Min-Hsiu Hsieh
Director, Hon Hai Quantum Computing Center (台灣)
The Power of Quantum Neural Networks |
| 9:45 – 10:00 | 邱奎霖教授 Prof. Kuei-Lin Chiu
Assistant Professor, Department of Physics, National Sun Yat-sen University (台灣)
Quantum Materials for Qubit Application |
| 10:00 – 10:15 | 姚正邦博士 Dr. Jeng-Bang Yau
Research Scientist, IBM Quantum, IBM T.J. Watson Research Center (美國)
QC Development in US Industry – Introduction to IBM Quantum |
| 10:15 – 10:30 | 呂文森博士 Dr. Wen-Sen Lu
Research Scientist, IBM Quantum (美國)
From Quantum Hardware to Quantum Workforce |
| 10:30 – 11:00 | 開放討論與問答
周澤民教授 Prof. Emery Jou 開場 |



張慶瑞教授 Prof. Ching-Ray Chang

Distinguished Professor, National Taiwan University

Prof. Ching-Ray Chang received the B. S. degree in Physics from National Taiwan University, Taipei, Taiwan, in 1979, then Ph.D. degree in Physics from University of California, San Diego, in 1988.

He was associated with magnetic group of Industrial Technology Research Institute in 1988. Since 1989, he has been with National Taiwan University, where he was Executive Vice President and also Interim President of University. Prof. Chang has worked in micromagnetic numerical modeling since 1980s. He not only carried out pioneering static studies of micromagnetic structures in the early 80s but also was one of the first to apply the Landau-Lifschitz equation to sub-nanosecond analysis in the 1990s. Prof. Chang has made very significant scientific contributions and had great impact on the understanding of nucleation, spin dynamics and thermal activation of magnetic materials, also recently spin transport in low dimensional materials. He was the president of Asia Union of Magnetic Societies (AUMS) and Director of the Center for Theoretical Physics in NTU. He also served as Presidents of both Taiwanese Physical Society and Taiwan Associations of Magnetic Technologies. He is both APS and IEEE Fellows. He has authored more than 280 papers published and held more than 28 magnetic related patents.

Currently he is director of NTU-IBM quantum computer hub and also the Chair of quantum computer promotion office, MOST. Prof. Chang also Founded the Taiwan Association of Quantum Computer and Information Technologies and he is the President.



謝明修博士 Dr. Min-Hsiu Hsieh

Director, Hon Hai Quantum Computing Center

Min-Hsiu Hsieh received his BS and MS in electrical engineering from National Taiwan University in 1999 and 2001, and PhD degree in electrical engineering from the University of Southern California, Los Angeles, in 2008. From 2008-2010, he was a Researcher at the ERATO-SORST Quantum Computation and Information Project, Japan Science and Technology Agency, Tokyo, Japan. From 2010-2012, he was a Postdoctoral Researcher at the Statistical Laboratory, the Centre for Mathematical Sciences, the University of Cambridge, UK. From 2012-2020, he was an Australian Research Council (ARC) Future Fellow and an Associate Professor at the Centre for Quantum Software and Information, Faculty of Engineering and Information Technology, University of Technology Sydney, Australia. He is now the director of

Hon Hai (Foxconn) quantum computing center. His scientific interests include quantum information, quantum learning, and quantum computation.

Abstract: Quantum neural networks (QNNs) have been broadly used in various works with different levels of claimed benefits. One of my research interests in quantum machine learning is to understand the power of QNNs. In this talk, I will first compare the expressive power of QNNs with Boltzmann machines. Next, I will provide our results on the learnability of QNNs in terms of its trainability and generalization. Finally, I will provide a few applications of QNNs on machine learning tasks and ground state approximations.



邱奎霖教授 Prof. Kuei-Lin Chiu

Assistant Professor, Department of Physics, National Sun Yat-sen University

Kuei-Lin Chiu is currently an assistant professor in the Department of Physics, National Sun Yat-sen University, Taiwan. Prior to this, he was an associate research fellow (faculty) in the Key Laboratory of Quantum Information, University of Science and Technology of China (USTC), and a post-doc at the Department of Physics at MIT (2015-2017). He obtained his Ph.D. from the Cavendish Laboratory in Cambridge University (2012) where he worked on quantum transport in 2D material-based quantum dots involving using microwave to control single electrons. His current research focuses on topological materials and superconducting quantum circuits. In particular, he demonstrated a flux-tunable superconducting quantum circuit consisting of Weyl semimetal MoTe₂, with an intention to probe the topological properties of materials using superconducting qubit measurement techniques. This research is recently highlighted in the [University news of NSYSU](#).



姚正邦博士 Dr. Jeng-Bang Yau

Research Scientist, IBM Quantum, IBM T.J. Watson Research Center

Dr. Jeng-Bang Yau is a Research Scientist in the IBM Quantum group at the IBM T.J. Watson Research Center, with research focused on exploration and development of Experimental Quantum Computing Technology. Dr. Yau received his B.S. and M.S. degrees in Electrical Engineering from National Tsing Hua University in Hsinchu, Taiwan and his Ph.D. degree in Electrical Engineering from Princeton University in 2002. The research topic of his Ph.D. thesis has been featured in the Research Highlights of Nature Physics and Science magazine. Prior to joining IBM Research in 2006, he was a postdoctoral research associate in the Dept. of Applied Physics at Yale University.

Dr. Yau has received various corporate honors including IBM Inventor Plateau Award, Manager Choice Award, and Eminence and Excellence Award. He currently holds over 110 patents and published 40+ peer-reviewed technical papers. He is a member of the Board of Directors and currently the vice-president of the Chinese Institute of Engineers-Greater New York Chapter. He is also a regular referee of technical and scientific journals such as IEEE Journals, Applied Physics Letters, Journal of Applied Physics, and Physical Reviews.



呂文森博士 Dr. Wen-Sen Lu

Research Scientist (RSM), IBM Quantum

Wen-Sen (Vincent) received his Ph.D. in Physics from Rutgers University in 2021, his thesis work focused on the realization of protective superconducting circuits with low E_J Josephson junctions and superinductors. Before he came to US to pursue his degree, he served in TSMC R&D for two and a half years on implementing three-dimensional IC stacking (3DIC) technology into fingerprint sensors on smart phones. Currently he is working on integration and simulation of noisy intermediate scale quantum devices in IBM Quantum.



葉人豪博士 Dr. Jen-Hao Yeh

Electrical Engineer, Rigetti Computing

Jen-Hao Yeh is an Electrical Engineer in Rigetti Computing, where he develops cryogenic microwave hardware for superconducting quantum computers. He was a postdoc researcher in the Laboratory for Physical Sciences, where he invented cryogenic attenuators for superconducting quantum devices, with a US patent. Jen-Hao received his Ph.D. degree in Electrical Engineering at the University of Maryland in 2013, and his B.S. degree in EE and Physics (double major) at National Taiwan University in 2006.