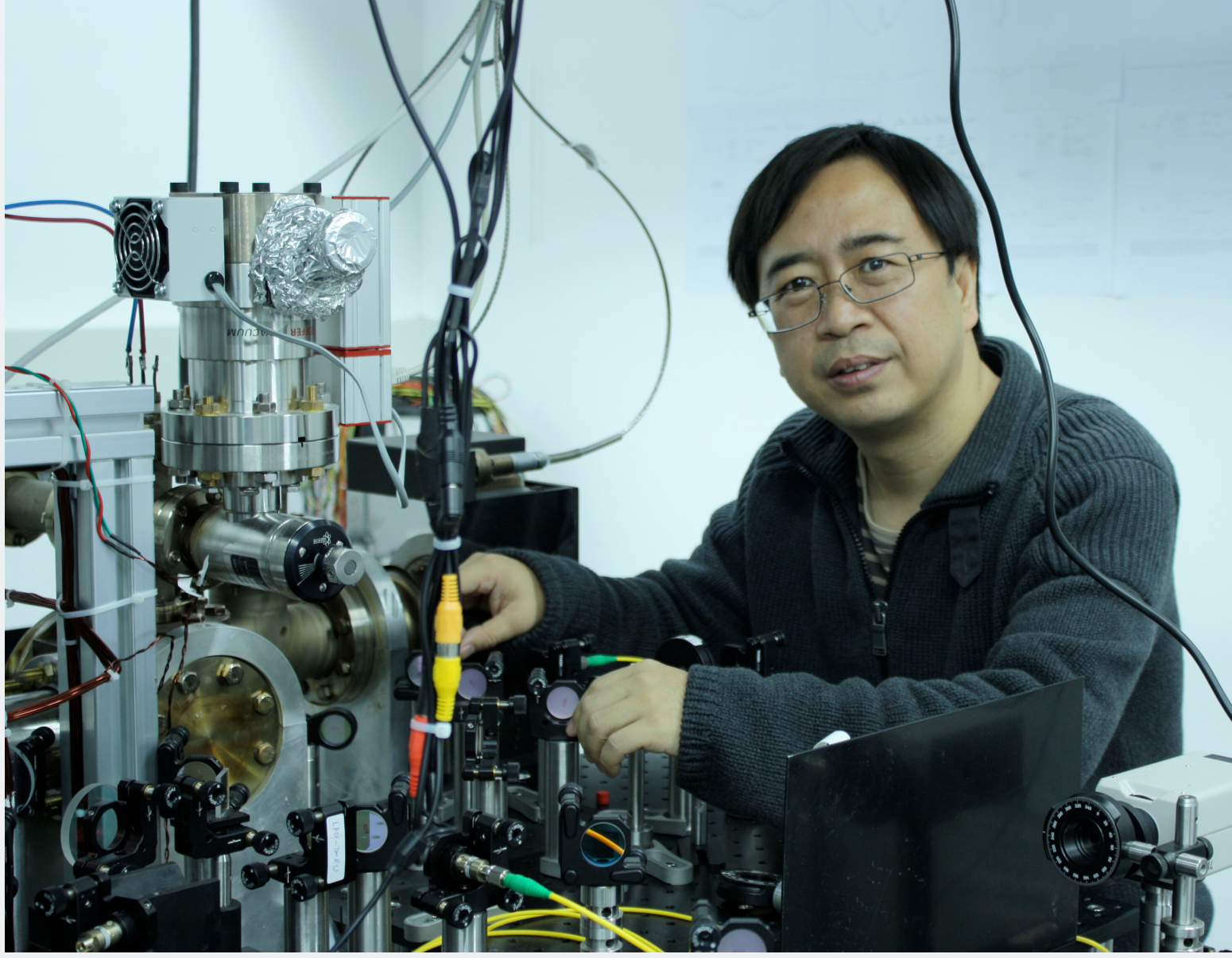
PUBLIC LECTURE

RRI



Quantum Leap: From Test of Quantum Foundations to New QuantumTechnologies

by Jian-Wei Pan

JANUARY 17
2020
FRIDAY
5:00-6:30 PM

VENUE

RRI AUDITORIUM, RAMAN RESEARCH INSTITUTE, C. V. RAMAN AVENUE, 5TH CROSS ROAD, SADASHIVANAGAR, BENGALURU, KARNATAKA 560080

Driven by the initial curiosity of “spooky action at a distance” referred by Einstein, in the last few decades, many ground-breaking technologies were developed for coherent manipulation of quantum systems. This consequently leads to the emerging quantum information sciences including quantum communication and quantum computation. While quantum communication can ensure secure information exchange, quantum computation can greatly enhance the computing power.

Over the past three decades, the promises of super-fast quantum computing and secure quantum cryptography have spurred a world-wide interest in quantum information, generating fascinating quantum technologies for coherent manipulation of individual quantum systems. However, the distance of fiber-based quantum communications is limited due to intrinsic fiber loss and decreasing of entanglement quality. Moreover, probabilistic single-photon source and entanglement source demand exponentially increased overheads for scalable quantum information processing. To overcome these problems, we are taking two paths in parallel: quantum repeaters and through satellite. Based on these techniques, we are developing quantum repeaters that combine entanglement swapping, entanglement purification, and quantum memory for the ultra-long distance quantum communication. The second line is satellite-based global quantum communication, taking advantage of the negligible photon loss and decoherence in the atmosphere. The quantum science satellite ‘Micius’ was launched in 2016, and accomplished High-rate QKD between satellite and ground, quantum entanglement distribution from satellite and quantum teleportation from ground to satellite, for the first time

ABOUT THE SPEAKER:

Jian-Wei Pan, born on 11 March 1970, received his PhD (1999) from the University of Vienna. After his PhD, Pan worked in Anton Zeilinger’s group in Vienna as a senior research associate until 2003 when he joined the University of Heidelberg to build up his group. Since 2009, Pan is an honorary professor of the University of Heidelberg. He is currently a Professor of Physics at the University of Science and Technology of China, an Academician of Chinese Academy of Sciences (CAS), and a Fellow of the World Academy of Sciences (TWAS). He serves as the Director of the CAS Centre for Excellence and Innovation in Quantum Information and Quantum Physics, and the Chief Scientist for the Quantum Science Satellite Project, and the Beijing-to-Shanghai 2000-km Quantum Communication Backbone Project.

Organised by

RAMAN RESEARCH INSTITUTE

QIF 2020