

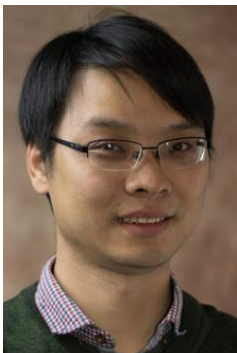
Silicon quantum photonics technology and its applications in information processing and transmission

Dr. Jianwei Wang (Univ. of Bristol, UK)

About the lecture:

In this talk I will discuss the silicon quantum photonics circuitry technology and its applications. Silicon photonics has many excellent classical and quantum photonics properties, which would allow a monolithic integration of many photon sources, quantum circuits and photon detectors. I will first discuss our recent progress of this technology and then its applications in the fields of quantum communications, learning and simulating quantum systems and quantum computing. In particular, the chip-to-chip quantum communication technology will be discussed, which allows the distribution of entangled states and transfer of quantum information between separated chips for secure communications, by controlling and engineering different degrees of freedom of photon. Then I will talk the implementation of machine learning techniques to quantum simulation and computation, including combining quantum simulation with machine learning to learn the Hamiltonian dynamics of quantum systems, an experimental implementation of a new Bayesian approach to phase estimation, and eigenspectra calculation based on a new concept of eigenstate witness.

Brief bio:



Dr Jianwei Wang received the B.Eng. and Master degrees from the Optical Engineering of Zhejiang University (China) in 2008 and 2011, and finished the Physics Ph. D. in Center for Quantum Photonics (CQP), University of Bristol in 2015. Currently, he is an Associated Post-doctoral Researcher in CQP at Bristol. His research interests now focus on the development of large-scale integrated quantum photonic circuitry on silicon for the study of fundamental quantum mechanics and also for the quantum information applications in the fields of communication, machine-learning, simulation and computing.

May 22nd (Mon), 12-1pm @ BRK 2001