

Quantum Information Processing with Bosonic Circuit QED

Yvonne Gao

Xiaozhou Pan, Jonathan Schwinger, Ni-Ni Huang, Pengtao Song, Weipin Chua, Fumiya Hanamura, Atharv Joshi, Fernando Valadares, Adrian Copetudo, Clara Fontain, Tanjung Krisnanda, Radim Filip, Yvonne Y Gao

*Centre for Quantum Technologies,
National University of Singapore
3 Science Drive 2, S15
Singapore 117543 (Century Gothic 10)*

Yvonne.gao@nus.edu.sg

A promising path to realize robust universal quantum computing involves the encoding logical qubits in continuous variables (CV) quantum elements. In particular, superconducting microwave cavities coupled to one or more anharmonic elements in the bosonic circuit quantum electrodynamics (cQED) architecture provide a valuable resource for the hardware-efficient encoding of logical qubits.

In this talk, I will introduce our recent results on creating, manipulating, and characterizing highly non-classical states in superconducting cavities. These works provide the important building blocks of a robust universal quantum computer.