University of Colorado **Boulder**

Designing Quantum Networks of Optically Connected Microwave Systems Limited by Transduction

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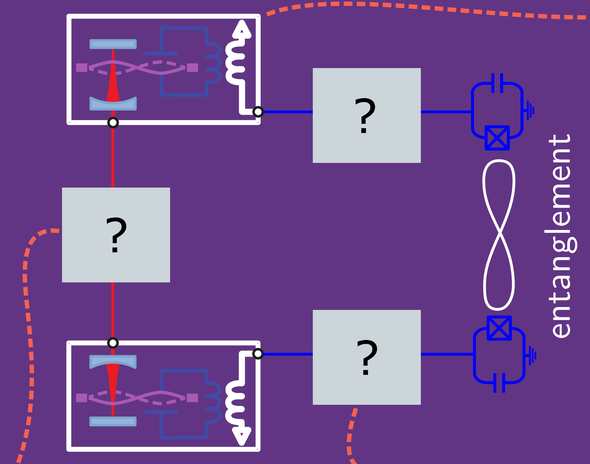
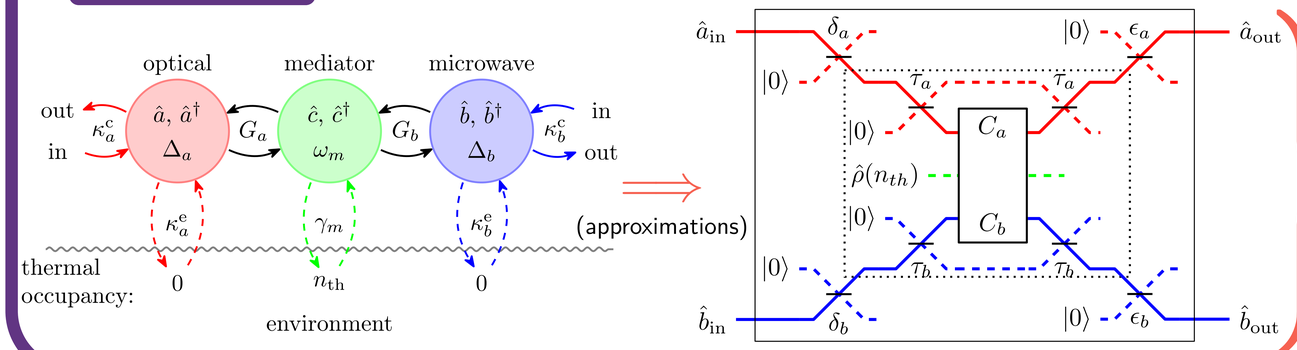
Quantum networks of optically-connected superconducting microwave qubits will implement communication protocols over physical network topologies. We show how the optimal network will depend on achievable transducer performance and available states/measurements.

Scan me!
(links to poster & paper)

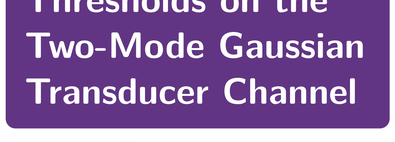


The Model

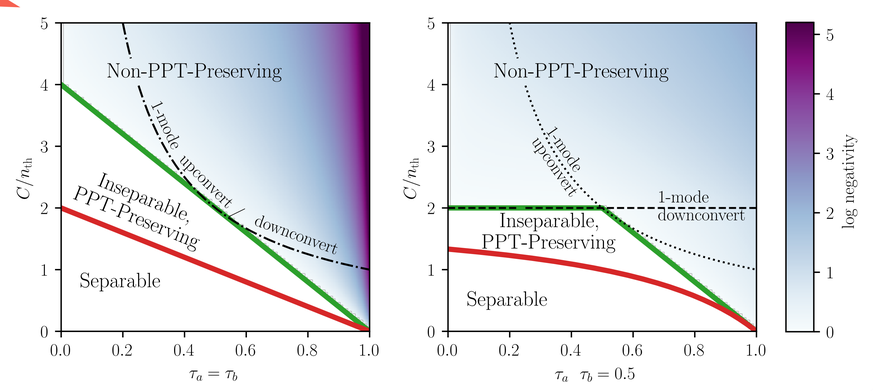
Doubly-parametric transducer (e.g. electro-opto-mechanical)



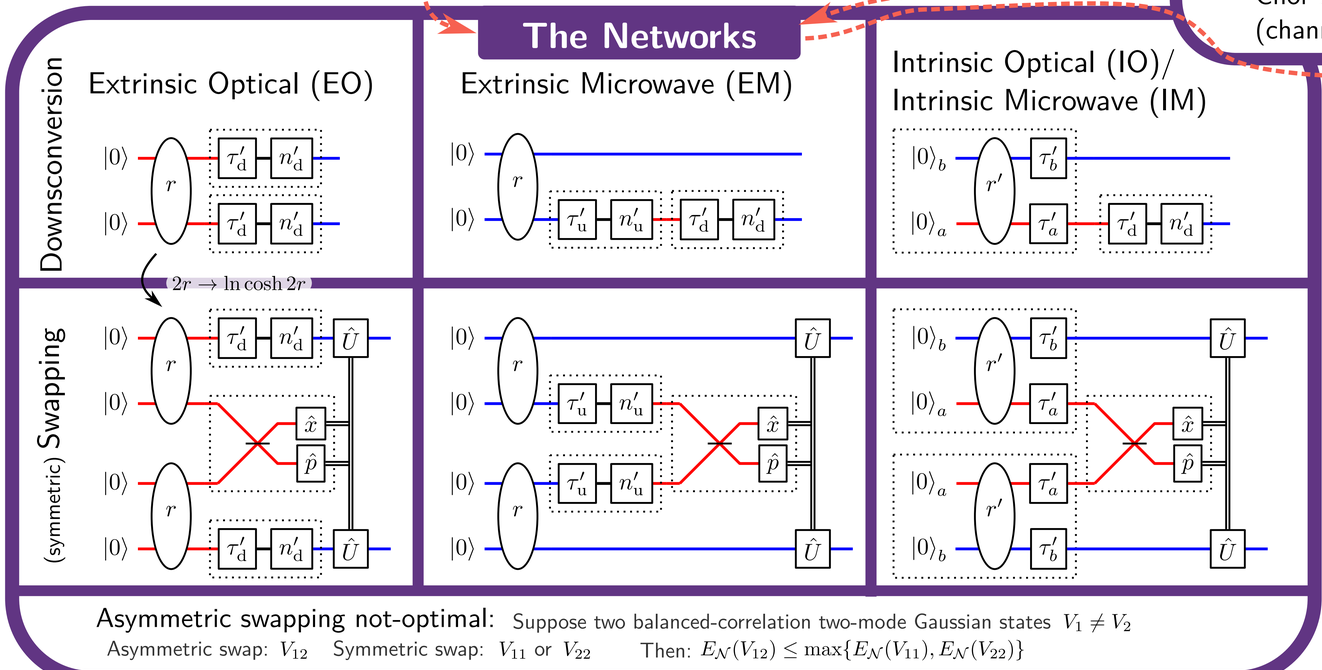
Thresholds on the Two-Mode Gaussian Transducer Channel



Choi–Jamiołkowski isomorphism (channel-state duality) in CV



The Networks



Asymmetric swapping not-optimal: Suppose two balanced-correlation two-mode Gaussian states $V_1 \neq V_2$
Asymmetric swap: V_{12} Symmetric swap: V_{11} or V_{22} Then: $E_{\mathcal{N}}(V_{12}) \leq \max\{E_{\mathcal{N}}(V_{11}), E_{\mathcal{N}}(V_{22})\}$

Network Comparison: Microwave-Microwave Entanglement