# Entangling remote qubits through a two-mode squeezed reservoir


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The distribution of entanglement across distant qubits is a central challenge for the operation of scalable quantum computers and large-scale quantum networks. Existing approaches rely on deterministic state transfer schemes or probabilistic protocols that require active control or measurement and postselection. Here we demonstrate an alternative, fully autonomous process, where two remote qubits are entangled through their coupling to a quantum-correlated photonic reservoir. In our experiment, a Josephson parametric converter produces a Gaussian, continuous-variable entangled state of propagating microwave fields that drives two spatially separated superconducting transmon qubits into a stationary, discrete-variable entangled state. Beyond entanglement distribution, we also show that superconducting qubits can be used to directly certify two-mode squeezing, with higher sensitivity and without the need for calibrated noise-subtraction. These results establish networks of qubits interfaced with distributed continuous-variable entangled states as a powerful new platform for both foundational studies and quantum-technology relevant applications.


## Figures

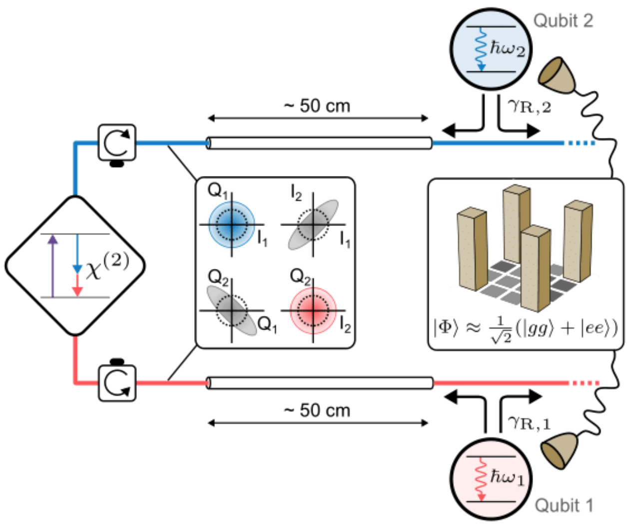


**Figure 1:** Sketch of the implemented entanglement distribution scheme.