Quantum computing: Production of photonic Fock ≥4 states

Area: Experiment, quantum optics, data acquisition, post-processing and visualisation

Motivation: The technology developed by the working group for the production and measurement of squeezed light will produce new states in quantum optics. Ultimately, this will be a mesoscopic GKP state that will allow universal + fault-tolerant + scalable quantum computing.

Goal: Two EPR-entangled laser beams have already been produced. Conditioned on the "clicks" of \geq 4 of 8 superconducting single-photon detectors, the complete quantum information of a Fock- \geq 4 state is measured with a balanced homodyne detector and represented as a Wigner function with negative quasi-probabilities after the inverse Radon transformation.