

Special Day
Condensed Matter Seminar

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Efficient benchmarking of photonic cluster state sources

Wednesday, May 24, 2:00 p.m.

304 Robeson Hall

Certain single-photon sources are capable of emitting strings of entangled photons. In particular, photonic cluster state sources could enable measurement-based quantum computing and are therefore under intense investigation. While experiments are progressing, the issue of benchmarking comes to the fore. The challenge is to quantify the useful long-range entanglement of a large photonic state using only the few-photon correlation measurements that are feasible given limited emission/detection efficiencies. We present a lower bound on localizable entanglement that requires only simple three-qubit correlation measurements. This method therefore enables direct demonstration of computationally powerful multi-photon entanglement with currently available experimental capabilities.