

Quantum Advantage with Continuous Variable Optical Systems

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Continuous variable (CV) optical quantum systems are achieving remarkable milestones in quantum information science and technology. Recent breakthroughs include the demonstration of quantum computation through Gaussian boson sampling and the application of squeezed states for extreme quantum sensing in gravitational wave detection. These advancements lay the groundwork for future experiments with CV systems.

In this talk, I will present my group's efforts to leverage CV optical quantum systems to achieve quantum advantage in learning and computation. Highlights include demonstrating massive quantum advantage in quantum learning and making critical progress toward quantum computational advantage. I will discuss these developments, address key challenges, and provide an outlook for the future of CV quantum information science.