

Creating multiparticle entanglement with optical fiber microcavities

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An exciting and fast-growing research field has emerged at the interface of fundamental physics and technology, where the nonclassical features of quantum mechanics are employed to engineer powerful, radically new technologies. Multiparticle entanglement is a key resource in these technologies. I will describe how high-finesse optical cavities can be used to produce and detect such entanglement in ultracold atoms and other quantum emitters, and show examples from recent experiments in our group with fiber microcavities on atom chips. One application is quantum metrology, and I will show progress towards a spin-squeezed atomic clock on a chip.