

Quantum sensing and metrology with quantum states of light

In this talk, I will introduce the general framework for quantum optical sensing that has been developed in recent years, covering the basic theory behind the advancements made, and describe the important works that made those advancements. A few paradigmatic examples of classical optical sensors and corresponding quantum sensors are compared in parallel, upon parameter estimation theory that is widely used for determining fundamental bounds on how well parameters can be estimated in both the classical and quantum regime. Lastly, I will review recent progress in quantum sensing and metrology using quantum states of light, and address recent important issues and challenges that could shape future research directions in this area.