

TRR Guest Scientist Lecture / Seminar

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Quantum-limited measurements: One physicist's crooked path from relativity theory to quantum optics to quantum information

Abstract:

Quantum information science has changed our view of quantum mechanics. Originally viewed as a nag, whose uncertainty principles restrict what we can do, quantum mechanics is now seen as a liberator, allowing us to do things, such as secure key distribution and efficient computations, that could not be done in the realistic world of classical physics. Yet there is one area, that of quantum limits on high-precision measurements, where the two faces of quantum mechanics remain locked in battle. I will trace the history of quantum-limited measurements, from the use of nonclassical light to improve the phase sensitivity of an interferometer, to the modern perspective on the role of entanglement in improving measurement precision.

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