



复旦大学物理系 Colloquium

Time: 14:00, Tuesday, 2024.3.5

Location: C108, Jiangwan Physics Building

Quantum enhanced sensing with spinor atomic condensates in linear and nonlinear interferometries

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Abstract: Statistical inference of a parameter based on measurements from an ensemble of uncorrelated particles is lower bounded by the classical precision limit or the standard quantum limit (SQL). Quantum entangled ensembles can beat the SQL. Several paradigms for such enhanced interferometry will be discussed, and demonstrative experiments with spinor atomic Bose-Einstein condensates reported. Many-atom squeezed states, entangled states with reduced quantum noise, are deterministically generated and applied in linear interferometry, effective time-reversed evolutions of entanglement generating interactions are implemented for nonlinear interferometry to amplify signal preferentially over noise, both demonstrating quantum enhanced precisions.



Biography: Li You, APS Fellow (2007), obtained his BS from Nanjing University in 1987, and his Ph.D. from JILA, University of Colorado in 1993. From 1993-1996, he was an NSF postdoctoral fellow at Institute for Theoretical Atomic and Molecular Physics (ITAMP) of Harvard-Smithsonian Center for Astrophysics. He joined Georgia Tech in 1996 and became Professor of Physics in 2004. He moved to Tsinghua University in 2009. His research interests include atomic physics, quantum optics, and quantum information science.