

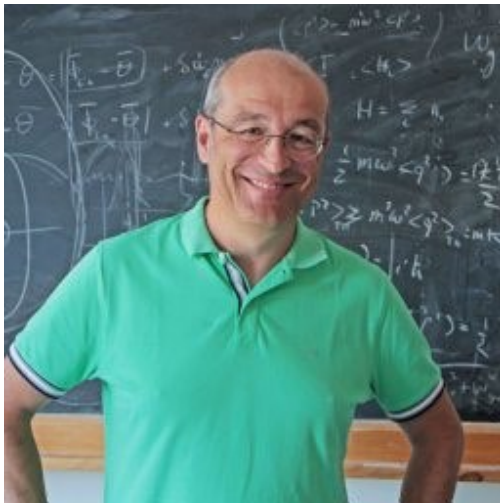
Quantum Science & Technology

Quantum Sensing and Quantum State Manipulation in Cavity Optomechanics

David Vitali

Professor of Theoretical Physics
University of Camerino, Italy**Date: Friday, March 8, 2024****Time: 10:00am – 11:30am****In-person: EEB 248**

Abstract: Cavity Optomechanics offers the possibility to generate and manipulate quantum states of mesoscopic mechanical resonators allowing the realization of useful components of quantum networks, and at the same time testing fundamental aspects of physics theories. We will review recent proposals for generating multipartite entangled states of mechanical resonators and also their exploitation for quantum sensing of weak forces and signals.



Biography: David Vitali graduated in Physics at the University of Pisa in 1988 and obtained his PhD in Physics from the Scuola Normale Superiore of Pisa in 1994. He has been Visiting Lecturer at the University of North Texas (USA), at the Ecole Normale Supérieure in Paris, at the University of Queensland, Brisbane (Australia), and at the University of Vienna. He is Full Professor of Theoretical Physics at the University of Camerino since 2015.

He is the author of 193 publications in international refereed journals, with more than 10700 citations and Hirsch index $h = 52$ referring to the SCOPUS database. He has carried out research in many subfields of Quantum Optics and Quantum Information Theory, such as entanglement manipulation, quantum communication and quantum key distribution, quantum optics implementation of quantum technologies. In 2015 he was named APS Fellow of the American Physical Society, “For groundbreaking work on cavity opto-mechanics, which proved to provide

an ideal and flexible environment for quantum information processing and quantum-limited sensing; for proposing pioneering techniques to control decoherence in quantum systems.” In 2021 he was nominated OPTICA Senior Member, and he has coordinated various European projects and many National projects, all related to quantum technologies and quantum optomechanics.

Hosted by: Quntao Zhang, Wade Hsu, Mengjie Yu, Jonathan Habif & Eli Levenson-Falk