

The **Vienna Center for Quantum Science and Technology VCQ**

invites you to a

COLLOQUIUM TALK

by

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Sensing with continuous quantum measurements

Many sensing applications are concerned with the continuous monitoring of time-dependent phenomena such as a varying electromagnetic field, temperature, or acceleration and forces through their influence on a quantum meter system. When a state or an observable of a single quantum system is probed continuously in time, the measurement results take the form of a time dependent measurement record, where the measurement outcome at each instant of time is random and governed by Born's rule, while the quantum meter system, in turn, evolves due to the back action of the measurements. The measurement back action may benefit sensing by conditionally squeezing the measured observable and hence improving the sensitivity, and by quenching the system and launching transient responses of the system with stronger dependence on the imposed perturbations than displayed in the steady state. We review the use of quantum trajectories for optimal estimation of imposed perturbations, the possibility to retrodict past values of perturbations from later measurements, and theories to compute the classical and quantum Fisher information, which assess the sensing capabilities of a given quantum meter system in a deterministic manner.

Monday, 25 November 2024

at Lise Meitner Lecture Hall at Universität Wien
Boltzmannngasse 5, 1090 Vienna, 1st floor

17:00 VCQ Student Talk by Jakob Hüpfel

17:15 VCQ Colloquium Talk

18:15 Punsch and Maroni

Host: Stefan Rotter