

Invitation to IQST Seminar

on Thursday, April 26th, 2018, 2.30pm
Ulm University
N24, Room 251
Albert-Einstein-Allee 11



Dr. Aharon Brodutch

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Ignorance is strength: Quantum measurements in a non-local world

In quantum theory we often use the term 'observable' interchangeably with 'Hermitian operator'. However, not all Hermitian operators correspond to quantities that can be `observed' in the usual quantum mechanical sense, i.e a projective measurement. Causality, the finite speed of light, and measurement-disturbance relations, impose constraint on the types of non-local observables that can be measured without additional resources such as communication (i.e time) and/or entanglement. Unfortunately, there are no generic methods to identify and quantify the types of resources necessary to measure a specific non-local observable while maintaining ignorance about the local properties. I will present a generic protocol that can be used to perform a projective measurement of a wide range of non-local operators and show how we are currently using this protocol in an optical implementation of the quantum pigeonhole paradox, effectively creating a photon-photon interaction Hamiltonian.

Host: Prof. Dr. Tommaso Calarco, Institute for Complex Quantum Systems, Dr. Ressa Said,
Institute for Quantum Optics, Ulm University