

Colloqui della Classe di Scienze

Anno Accademico 2013/2014

15 GENNAIO 2014

ore 15.00

Sala Stemmi

Palazzo della Carovana

Piazza dei Cavalieri

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Interfacing single photons and condensed-matter systems

ABSTRACT

There are two complementary approaches for investigating quantum optical phenomena in the solid-state. The first approach exploits the superior optical properties of solid-state emitters and the possibility of integrating them in photonic nanostructures, for realizing indistinguishable single-photon sources, all-optical spin manipulation as well as demonstration of a quantum interface between flying photonic qubits and stationary spin qubits. The second approach uses quantum optical techniques such as cavity quantum electrodynamics or photon correlation measurements as novel spectroscopic tools for studying many-body phenomena such as the Fermi-edge singularity or the quantum Hall effect. In this talk, I will describe recent experiments addressing these new frontiers at the intersection of quantum optics, condensed-matter physics and quantum information processing.



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