



University of Crete
Department of Physics

Physics Colloquium

Wednesday, 3 May 2023 | 11:00 – 12:00, Seminar Room 3rd Floor

Quantum optics in cold atomic gases

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ABSTRACT

The groundbreaking demonstration of slow and even stopped light in cold atomic ensembles led to a plethora of applications of quantum technology, spanning from ultrasensitive sensors and precise interferometers to single-photon switches and quantum memories.

After a brief introduction to the field of quantum optics with cold atomic gases and its applications, I will be presenting two recent experimental studies conducted by our group. More specifically, I will demonstrate how a non-Hermitian quantum interface between single atoms and light can surprisingly switch bosonic correlations to fermion-like ones, and how such a process can contribute to quantum storage and potentially quantum computation. I will also present a new way to simultaneously arbitrarily manipulate the temporal and spatial wavefunctions of entangled non-spreading photons generated from an atomic gas.