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סמינר

From Multimode Nonlinear Optics to High-Dimensional Quantum Communications

Kfir Sulimany
The Hebrew University of Jerusalem
Jerusalem, Israel

Abstract

Quantum photonics often relies on nonlinear optics for the generation of photons, followed by reconfigurable linear optical networks for coherent control. In this talk, I will review our study of multimode nonlinear optics in fibers, which also enabled our realization of an all-fiber entangled photon pairs source. These photons are spatially entangled in the eigenmodes of the multimode fiber, allowing for high-dimensional quantum communications. I will then present a couple of methods to coherently control such states. The first is achieved by multiplane light conversion based on a spatial light modulator, while the second is by employing a “Fiber piano”; a piezo-actuator array that deforms the multimode fiber. Finally, I will introduce a novel Quantum Key Distribution protocol that utilizes high-dimensional encoding to boost the secure key rate and its experimental implementation.

ההרצאה תתקיים ביום רביעי, ה-17.1.24 בשעה 12:30
באודיטוריום המכון למצב מוצק, קומת כניסה
The lecture will take place on Wednesday, 17.1.24 at 12:30
at the Solid State Institute auditorium, entrance floor

Visitor of Associate Professor Ido Kaminer