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SEMINAR **סמינר**

Quantum Entanglement of the Spin and Orbital Angular Momentum of Photons using Metamaterials

Tomer Stav

Department of Physics and the Solid State Institute,
Technion

Abstract

Metamaterials have been a major research area for more than two decades now, involving artificial structures with predesigned electromagnetic properties constructed from deep subwavelength building blocks. They have been used to demonstrate a wealth of fascinating phenomena ranging from negative refractive index and epsilon-near-zero to cloaking, emulations of general relativity effects, and super-resolution imaging, to name a few. In the past few years, metamaterials have been suggested as a new platform for quantum optics, and several experiments have already been carried out with single photons. Our upcoming paper in Science shows how we employ a dielectric metasurface to generate entanglement between spin and orbital angular momentum of single photons. We demonstrate experimentally the generation of the four Bell states by utilizing the geometric phase arising from the photonic spin-orbit interaction, and subsequently show nonlocal correlations between two photons which interacted with the metasurface. These are the first experiments where entangled photon states are generated by a metasurface, thus paving the way to the new area of quantum metamaterials.

ההרצאה תתקיים ביום רביעי, ה-15.8.18 בשעה 12:30
באודיטוריום המכון למצב מוצק, קומת כניסה
The lecture will take place on Wednesday, 15.8.18 at 12:30
at the Solid State Institute auditorium, entrance floor

M.Sc. Student of Distinguished Professor Moti Segev