



Solid State Institute
המכון למצב מוצק

TECHNION
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סמינר

Light-matter interactions in nanophotonic systems

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Abstract

In this talk, I will describe some of our recent work in using nanophotonic systems to realize new and enhanced classical and quantum light sources.

In the first part of the talk, I will describe what photonic nanostructures can do for "classical" light sources, such as scintillators, which are materials that detect ionizing radiation by converting them into visible photons. By integrating a scintillating material into a photonic crystal, we show experimentally how the scintillation can be strongly shaped and even enhanced by an order of magnitude, showing results for both electron-beam and x-ray-induced scintillation. In the second part of the talk, I will describe new theoretical concepts for tailoring quantum light states, by tailoring the nonlinear and dissipative properties of photons. As an example of this broader concept, I will show how photonic resonators with Kerr nonlinearity and photonic bound states in the continuum enable a surprising new effect in nonlinear optics in which a coherent state of light spontaneously evolves into a large multi-photon Fock state, deterministically. Finally, I will discuss a few of the new avenues we are pursuing in the field of quantum nonlinear optics, particularly with respect to both the fundamental physics of driving material systems with strong quantum light, as well as the physics of novel nonlinearities enabled by strongly interacting light-matter systems.

ההרצאה תתקיים ביום רביעי, ה-18.1.23 בשעה 12:30

באודיטוריום המכון למצב מוצק, קומת כניסה

The lecture will take place on Wednesday, 18.1.23, at 12:30
at the Solid State Institute Auditorium, entrance floor

Host: Associate Professor Ido Kaminer