



Solid State Institute  
המכון למצב מוצק

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הטכניון  
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לישראל

SPECIAL SEMINAR

סמינר מיוחד

## Enhancing and Shaping Radiation from High-Energy Particles with Nanophotonics

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### Abstract

Nanophotonics has become over the past decades a paramount technology, enabling, among other things, the design of novel light sources, detectors, and devices controlling the polarization, spectral, and angular distribution of light. A landmark of nanophotonics is the design of nanostructured materials (metasurfaces, photonic crystals, nanoresonators, etc.) to tailor the interaction of light with matter, either by shaping light propagation at the nanoscale, or by controlling emission from atoms and molecules. In this talk, we will show how one can enhance and tailor radiation from high-energy particles, such as free electrons and x-rays with engineered nanophotonics structures. We present a framework to model, tailor, enhance, and even optimize radiation from free electrons and other high-energy particles interacting with nanophotonic structures. We then describe the building of a featured experimental setup to record spectrally-resolved light emission from free electrons interacting with nanophotonic structures. We utilize our methods to demonstrate nanophotonic enhancement of coherent and incoherent cathodoluminescence, in addition to scintillation from x-rays.

**ההרצאה תתקיים ביום חמישי, ה-16.3.23 בשעה 12:30  
באודיטוריום המכון למצב מוצק, קומת כניסה  
The lecture will take place on Thursday, 16.3.23 at 12:30  
at the Solid State Institute auditorium, entrance floor**

**Host: Associate Professor Ido Kaminer**