



The Hebrew University Center
for Nanoscience & Nanotechnology



האוניברסיטה
העברית
בירושלים

Nano Seminar

Optical Skyrmions: a New Topological State of Light

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Abstract:

Topological defects play a key role in a variety of physical systems, ranging from high-energy to solid state physics, yielding fascinating emergent phenomena. Skyrmions are topologically stable field formations which exist in a limited range of physical systems. Most famously, they appear in chiral magnets either as single skyrmions or a skyrmion lattice phase and are currently considered a promising route towards high-density magnetic information storage and transfer as they are very robust to material defects and can be driven by low applied currents.

However, skyrmions are scarcely used outside the field of magnetism and have never been demonstrated before in the field of optics.

I will present our recent study on optical skyrmion lattice, which was generated using surface plasmon polaritons (SPPs) and imaged by phase-resolved near-field optical microscopy. This optical skyrmion lattice is achieved by controlling the topology of evanescent waves with 6-fold symmetry and allows for tuning the properties of the skyrmions, such as their domain walls and spatial distribution.

Optical skyrmions could give rise to new physical phenomena involving skyrmions and exclusive to photonic systems; open up new possibilities for inducing skyrmions in material systems through light-matter interactions; and enable applications in optical information processing, transfer and storage.

Gathering & Refreshments at 11:50

Wednesday, December 5th 2018, 12:00 at the Seminar Hall

Los Angeles Building, entrance floor.

Please contact Alexandra Bannykh at 6584919 if you are interested in meeting the lecturer