

You are cordially invited to attend this seminar to be held on

Wednesday, January 11th, 16:00
Room 206, Wolfson Mechanical Engineering Building

Lithographically Driven Nanoscale Assembly

Dr. Mark Schwartzman

Department of Materials Engineering

Isle Katz Institute for Nanoscale Science and Technology,
Ben-Gurion University of the Negev

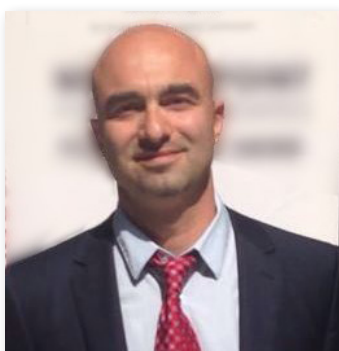
Short Abstract

In the first part of my talk, I will review our recent progress in the field of high-resolution nanoimprint lithography. Soft-Substrate-Rigid-Feature (SSRF) nano imprint mold are based on PDMS substrate with rigid relief features. It combines the advantages of the both soft and rigid molding approaches, and at the same time overcomes their drawbacks. Specifically, it provides a unique combination of: (1) High pattern fidelity and small feature size as offered by hard molds and (2) low sensitivity to defects and ability to pattern curved substrates as offered by soft molds. These molds were demonstrated bythrough nano imprint of UV-curable resist, as well as of thermal resist. The latter paved the way to novel soft-thermal nanoimprint, with unprecedented sub-100 nm resolution, including nanopatterning of unconventional substrates, e.g. lenses.

The second part of my talk will be dedicated to the applications of ultra-high nanoimprint lithography in nanoscale functionalities for programmed assembly, including:

1. Deterministic integration of chemically synthesized 1D nanostructures into ordered superstructures for bottom-up fabrication of nanomaterials and functional nanosystems.
2. Engineering of bi-functional biomimetic nanodevices that control the spatial distribution of activating and inhibitory receptors in T- and NK- immune cells with nanometer precision. These devices controllably mimic the surface of target cells with molecular resolution, and are used to study nanoscale structure and mechanism of immune synapse.

Biosketch



Mark Schwartzman received B.Sc. (1996) and M.Sc. (2001) from Technion. Following 5 years in hi-tech industry in various R&D and managing positions, he joined Ph.D program at Columbia University till graduated at 2009. He continued his research training as a postdoc at Weizmann Institute, till joined BGU at 2014. His research interests anactivities include nanofabrication with molecular resolution, unconventional lithographic approaches, bottom-up nanofabrication based on 1D nanostructures, and biomimetic devices for controlled organization of transmembrane proteins in stem and immune cells.