



Solid State Institute
המכון למצב מוצק

TECHNION
Israel Institute
of Technology



הטכניון
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סמינר

"Light induced shock wave interaction in opaque suspensions"

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Abstract

To date, almost all the research in optofluidics and optical manipulation of particles in fluids is limited to the regime of dilute suspensions, where the light field is easily manipulated deep within the fluid because the suspension is so dilute that scattering can be neglected altogether. In fact, optical manipulation of particles in opaque suspension was considered impossible up until 2013, when a former student in our group has demonstrated optically-induced shock-fronts of nanoparticles propagating deep within the opaque suspension, and light-induced phase transition in the regions where light has created very large concentration of nanoparticles and transformed the suspensions to a gel. That work has opened the door to the investigation of light-fluid interaction in opaque fluids.

I will present experiments studying the nonlinear interaction-collision between two light-induced shock waves of nano-particles in highly scattering (opaque) suspensions. I will show that such collisions give rise to the formation of gel domain walls between the shock waves. The interaction is dominated by the lateral offset between the input beams and their optical power. The interaction of the beams with a lateral offset creates shock-fronts, which transforms into unidirectional circulation whose direction is determined by the lateral offset. For a centered heads-on collision interaction, the shock waves give rise to a long-lived transverse domain wall, which is sensitive to very small asymmetry in the input beams.

ההרצאה תתקיים ביום רביעי, ה-29.6.16 בשעה 12:30

בבניין המכון למצב מוצק, בחדר הסמינרים

The lecture will take place on Wednesday, 29.6.16 at 12:30

at the Solid State Institute, seminar room

M.Sc. Student of Distinguished Professor Moti Segev