SEMINAR F-5

ODSEK ZA FIZIKO TRDNE SNOVI

Petek, 6. 5. 2022,
ob 11.00

v seminarski sobi fizike (soba 106)
Odsek za fiziko trdne snovi, Institut »Jožef Stefan«

dr. Mahendran Vellaichamy

Institut »Jožef Stefan«, Ljubljana

Physics and Optics of Magnetic nanoemulsions

Oil-water magnetic nanoemulsions are dispersions magnetic oil droplets in water. In the past two decades, the specific magnetic optical properties of these materials are exploited in research and technological fields. In this talk, I will briefly introduce the material and a customized magnetic chaining technique (MCT) that enables direct measurements of colloidal interaction between emulsion droplets as function of distance. The MCT technique exploits the fact that the anisotropy of the forces between dipoles causes the magnetic oil droplets to form chains. Because chains give rise to a strong Bragg diffraction of the visible light, the inter-droplet spacing is accurately measured from the diffracted colours. Moreover, because the attractive dipolar magnetic force can be varied trough the intensity of the external field, the balancing repulsive force can also be measured at various spacings. This technique has been used for the measurement of colloidal forces in the presence of many different surface-active species (surfactants, polymers, proteins) and has provided interesting insights (conformational change of polymers, competitive displacement adsorption) in the field of colloidal forces. I will also, discuss few novel applications of magnetic nanoemulsions as optical sensors.

Vljudno vabljeni!