

Grazing Incidence Small Angle Neutron Scattering (GISANS) applied on soft matter systems

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The concept of softness is encountered in different materials of the everyday life, although its precise quantification is still far to be achieved. In thin films of soft matter, quite often compounds that are energetically incompatible have to be mixed. The softness of the emerging thin films stems from the interactions of the underlying compounds. Such interactions play a key role in the mixing of the underlying building blocks and the microstructure. The microstructure of the soft matter thin films in turns determines the macroscopic properties of the material, such as stiffness, viscosity or apparent yield stress. Controlling these properties is fundamental for application in the pharmaceutical field, in health-care products, soft robotics and actuators as well as in the stabilization of emulsions. Grazing Incidence small-angle neutron scattering is a valuable fundamental method to probe soft materials at interfaces. The large scattering volume being probed by the shallow incident angles, the isotope sensitivity of neutrons as probes and large penetration power of neutrons renders GISANS ideal to access buried nanostructured on films of soft matter. In this talk, I will show examples of the use of GISANS to investigate different cases from soft matter systems at interfaces, including ordered micellar assemblies of pluronic surfactants, orientation of lamellae in multiblock copolymer films, alignment of phospholipid membranes, inorganic colloids at air-liquid interfaces, as well as stimuli-responsive polymer brushes under extreme hydrostatic pressure.

Presenter: VAGIAS, Apostolos (D22 co-responsible)

Session Classification: Invited speakers