

Plenary Talk

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Superfluid Helium Droplets — ●ANDREY VILESOV — University of Southern California, Los Angeles

Free superfluid helium droplets constitute a versatile platform for diverse experiments in physics and chemistry. In many applications, He droplets serve as an ultracold matrix for spectroscopic interrogation of single molecules, radicals, or ionic species. More recently, superfluid droplets have emerged as unique nano-laboratories for the study of

quantum vorticity in finite isolated systems.

In this talk, I will provide a brief historic account of experiments in helium droplets, an introduction to quantum vorticity, and a more detailed discussion of the rotational motion of superfluid helium droplets of a few hundreds of nm in diameter. The droplets are studied by ultrafast x-ray diffraction using a free electron laser. The diffraction patterns provide simultaneous access to the morphology of the droplets and the vortex arrays they host. The rotation of classical viscous and superfluid droplets will be compared.