SPECTROSCOPY AND DYNAMICS IN ^{4}HE NANODROPLETS: WHAT HAVE WE LEARNED AND WHAT ARE THE OUTSTANDING QUESTIONS?

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Superfluid ^{4}He nanodroplets provide a novel and almost ideal matrix for spectroscopy of atoms and molecules. Thanks to the efforts of several laboratories, we now have representative rotational, ro-vibrational, and electronic spectra of a number of different atomic and molecular species. This talk will survey what general lessons have been learned, such as times scales for some basic dynamic processes and the important role played by the thermal population of translational states. Outstanding questions will also be discussed. How thermal equilibrium is achieved in this isolated environment with a sparse density of states? Why have droplets with vortex lines not been definitively observed or where does the angular momentum of collision go?