

3S01 **Molecular spectroscopy and dynamics in helium nanodroplets**

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Nanodroplets of superfluid helium-4 atoms provide an almost ideal medium for condensed phase spectroscopy, combining many of the advantages of both traditional rare gas matrix spectroscopy and molecular beam gas phase spectroscopy. Helium is by far the most weakly interacting matrix, and the nanodroplets evaporatively cool to ~ 0.38 K. Because of the nearly isotropic environment and long (\sim nsec) rotational relaxation times, the vibrational spectra of most molecules displays rotational restructure that has the same selection rules as for the same molecule in the gas phase. In this talk, the properties of helium nanodroplets will be discussed in relation to spectroscopy, and examples of different types of spectroscopy and theoretical models will be discussed, concentrating upon the work of the Princeton group.

