



Physical Sciences Seminar

Electric and magnetic moments of cold molecules and clusters entrapped in superfluid helium nanodroplets

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Helium nanodroplets doped with polar molecules and molecular clusters can be strongly deflected by an external electric field, despite having masses of tens of thousands of atomic units. Such an intense deflecting force derives from the fact that within the cryogenically cold ($T=0.4$ K) superfluid matrix, the embedded dipoles become vibration-free and almost completely field-oriented. A deflection measurement can provide direct information about the presence and magnitude of permanent dipole moments, and thus about the structure of molecular assemblies formed inside the nanodroplet. The technique is quite general and can be applied to molecules of varying size and complexity. Recently we extended the method to Stern-Gerlach-type magnetic deflections of helium nanodroplets containing dopants with magnetic moments. In addition to revealing the magnetic moments of the dopants, these experiments raise questions about the mechanisms of spin relaxation within the helium bath.

Tuesday, October 24, 2023 11:00am - 12:00pm

Office Bldg West / Ground floor / Heinzl Seminar Room (I21.EG.101)



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