

**Ioannes Marcus Marci K**

**September 6, Thursday, 16:00 – 17:30**

## **A Particle Physics Laboratory Inside a Molecule: Frequency-Comb Molecular Ion Spectroscopy and the Electron's Electric Dipole Moment**

**Eric Cornell and the JILA eEDM Collaboration**

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An improved measurement of the electron's electric dipole moment (eEDM) would provide a sensitive test for physics beyond the Standard Model of particle physics. A polar molecule provides the ideal laboratory for applying high electric fields to the spin of an electron; asymmetries in the electron will lead to specific asymmetries in the molecule's spectrum. I will describe ongoing progress by the JILA eEDM collaboration towards an eEDM measurement based on precision ion-trap spectroscopy on  $\text{HfF}^+$  and on  $\text{ThF}^+$ . A wide range of spectroscopic techniques are employed: two-color photoionization, two-color photodissociation and coherent Raman population transfer. The necessary preliminary survey spectroscopy was accomplished by a recently developed technique of cavity-enhanced, frequency-comb velocity-modulation ion spectroscopy.