Sensing motion with cold atoms and ions

Assistant Professor Paul Hamilton
University of California, Los Angeles, Physics & Astronomy

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Venue: Remote via Zoom Join (Meeting ID: 884 6657 0839, Password: 640663)
https://us02web.zoom.us/j/88466570839?pwd=NEREQXNWS0tmaDJNMINXZGRqU5VZz09
Host: Assistant Professor Lan Shau-Yu

Abstract
The high precision and accuracy possible with atomic systems make them attractive for a range of applications including quantum sensing, quantum computation, and quantum simulation. I will discuss two experiments at UCLA towards sensing motion with laser-cooled atoms. The first borrows techniques from cavity QED to use an optical cavity to directly read out the motion of an ensemble of atoms over sub-wavelength scales on a microsecond timescale. The second experiment combines techniques from matter wave interferometry and quantum computation towards the creation of a single ion gyroscope.

Short Biography
As an undergraduate at Harvard, I worked in solar physics helping to build and use rocket- and satellite-based x-ray telescopes to study the solar corona. Upon going to Yale for graduate school I was immediately attracted to the field of atomic physics and its possibility to precisely study physics beyond the Standard Model. I continued pursuing this as a postdoctoral scholar at University of California, Berkeley, applying atom interferometry techniques to constrain models of dark matter and dark energy, before beginning my own research group at University of California, Los Angeles (UCLA). In addition to the experiments presented in the seminar my group is involved in collaborations searching for exotic physics using a global network of magnetometers (GNOME) and a search for sterile neutrinos by precise reconstruction of the radioactive decay of Cs-131 (HUNTER).

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