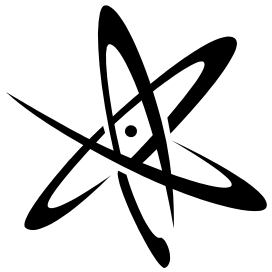
University of Washington ● Department of Physics

PHYSICS COLLOQUIUM

Mark G. Raizen (University of Texas at Austin)
"Comprehensive Control of Atomic Motion"
Monday, October 12, 2009
4:00 PM, Ronald Geballe Auditorium, Rm. A-102

Seminars



Oct 12– 16

Abstract: The method of laser cooling has opened the door to low temperature physics of dilute gases. Despite the great success of this method, it has been limited to a very small set of atoms in the periodic table and no molecules. I will describe in this talk new approaches to trapping and cooling that have been developed in my group. The first step uses pulsed magnetic fields to stop atoms and molecules where they can be magnetically trapped. The next step is an experimental realization of informational cooling as first proposed by Leo Szilard in 1929 in an effort to resolve the paradox of Maxwell's demon. Together, these provide a two-step comprehensive solution to trapping and cooling.

I will describe our progress in applying these new methods to trapping and cooling of hydrogen isotopes. In the short term, we are working to trap hydrogen and deuterium, which will serve as a step towards trapping of atomic tritium. This system will be used for precision measurement of beta decay towards determination of the neutrino rest mass. Our methods are also very applicable to trapping and cooling of anti-hydrogen, and a collaboration at an accelerator laboratory is being pursued.

Tuesday, October 13

General Exam
10:30 AM, C-520, PAT
Christopher Vermilion, UW Physics

Particle Theory Seminar
2:30 PM, C-421, PAT
Arnab Kundu , University of Southern California
"Gravity solutions dual to non-relativistic field theories "

Thursday, October 15

Energy Future Lecture
12:30 PM, A-118, PAA
Sean O'Connor , UW School of Law
"A Primer on Commercialization for Energy Researchers "

Astronomy Colloquium
4:00 PM, A-102, PAA
Moshe Elitzer , University of Kentucky
"The AGN Torus-a Paradigm Change "

Friday, October 16

Particle Theory Seminar
12:30 PM, TBA, PAB
Wai Yee Keung, University of Illinois, Chicago
"Generic dark matter signature for gamma-ray telescopes "
