

# University of Washington • Department of Physics

## PHYSICS COLLOQUIUM

Ivan Deutsch (University of New Mexico)

**“Quantum Control and Measurement: Two Keys to Quantum Information Processing”**

**Monday, October 5, 2009**

4:00 PM, Ronald Geballe Auditorium, Rm. A-102

Abstract: When we first learn about quantum mechanics it appears to be a paler version of classical physics. Quantities are fundamentally uncertain, random, and one cannot measure one thing without disturbing another. This notion cannot be further from the truth. Quantum physics is now understood to be fundamentally MORE powerful for performing certain information processing tasks, from factoring large numbers to sharing

secrets. Bringing this promise into laboratory and ultimately real devices has been a grand challenge. In this colloquium I will discuss two key components -- quantum control and measurement. These are flip sides of the same coin. In quantum control, one applies an external force to affect a dynamical map on the system of interest. In quantum measurement, information about the system is mapped to the probe, which can then be detected as a macroscopic signal. These paradigms are explored in a near ideal platform -- ultracold atomic spins controlled and measured through magneto-optical interactions. I will discuss the theoretical development of new protocols and their implementation in the laboratory in collaboration with Prof. P. S. Jessen.

**Tuesday, October 6**

### **Particle Theory Seminar**

2:30 PM, C-421, PAT

**Kieran Holland**, University of the Pacific

“Technicolor on the lattice”

### **CMA Seminar**

4:00 PM, C-421, PAT

**David Allender**, Kent State

“Possibility for an LCD that switches faster than existing ones: the biaxial nematic cell”

### **Astrobiology Public Talk**

7:30 PM, Kane Hall Rm. 120

**George Coyne, S.J.**, Vatican Observatory

“The New Cosmos of Galileo”

**Wednesday, October 7**

### **General Exam**

1:00 PM, C-520, PAT

**Xiaoli Li**, UW Physics

**Thursday, October 8**

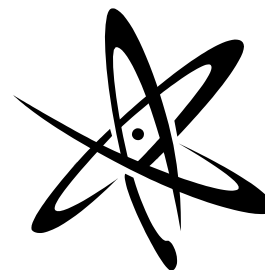
### **Astronomy Colloquium**

4:00 PM, A-102, PAA

**Anil Seth**, Harvard Center for Astrophysics

“Nuclear Star Clusters and Black Holes”

# *Seminars*



***Oct 5- 9***