

# University of Washington • Department of Physics

## PHYSICS COLLOQUIUM

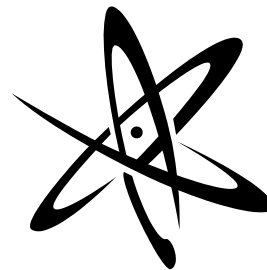
Margaret Murnane (JILA/UC Boulder)

Fred Schmidt Memorial Lecture

Partially funded by the GSFEI

“Harnessing Attosecond Science for Coherent X-Ray Generation and Applications”

# Seminars



Nov 10<sup>th</sup>-14<sup>th</sup>

### Monday, November 10th, 2008

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

**Abstract:** To generate coherent x-ray beams, extreme nonlinear optical techniques have succeeded in upshifting visible laser light into the x-ray region of the spectrum. This ability has given us a new coherent light source that spans such a large region of the spectrum that we now access processes that occur on sub-femtosecond or attosecond ( $1 \text{ as} = 10^{-18} \text{ s}$ ) time-scales. Equally intriguing is the fact that we have learned how to use femtosecond laser light to coherently manipulate electrons in atoms and molecules on their fundamental, attosecond timescales. The richness and complexity of attosecond science and technology is only just beginning to be uncovered. As I will discuss in this talk, attosecond science can capture the complex, interwoven dance of electrons in molecules and materials. Attosecond science also shows great promise for developing new ultrasensitive molecular imaging and spectroscopic techniques. Finally, attosecond science represents the most promising avenue to achieve what had seemed hopelessly impractical until now -- the generation of bright, coherent, hard x-ray beams using a tabletop-scale apparatus.

[1] H. C. Kapteyn et al., *Science* 317, 775 (2007).

[2] E. Gagnon et al., *Science* 317, 1374 (2007).

[3] X. Zhou et al. " *Physical Review Letters* 100, 073902 (2008).

[4] R. Sandberg et al., *Proc. Nat. Acad. Sci.* 105, 24 (2008).

### Thursday, November 13th, 2008

#### **Astronomy Colloquium**

4:00 PM, Rm. A-102, PAA

**Jill Knap**, Princeton

“High-Velocity Stars in the Galaxy”

### Friday, November 14th, 2008

#### **General Exam**

2:45 PM, Conference Room, Rm. 178, CENPA

**William Terrano**, UW Physics

#### **Particle Astrophysics Seminar**

3:30 PM, Rm. A-114, PAA

**Scott Davis**, UW Physics

“Measuring Pi0s at the T2K near detector “