

PHYS248A Winter 2008 (1 credit), SLN18841  
Thursday 12:30pm PAB A110

# Intro to Physics Research!

Instructor: Jerry Seidler (seidler@u)

This class gives a broad survey of the physics research going on at the University of Washington. In addition to discussing the various physical topics, the speakers will also cover the involvement of UW undergraduates in the various research programs and the prerequisites for getting into a research group. The lectures will target sophomore Physics majors, but all are welcome. If you haven't completed at least PHYS123, please contact Prof. Seidler before enrolling.

Background reading will be provided each week. Grades will be based on class participation and short on-line quizzes focused on the background reading and the lecture presentations. Students will also have an opportunity to tour many of the physics research labs at UW.

Tentative schedule:

**Weeks 1-3: *Neutrino science.*** Physicists at UW play a leading role in many of the cutting-edge experiments on the elusive neutrino, and how it relates to cosmological and geological questions. After reviewing the basic physics of neutrinos, they will give detailed presentations about world-wide efforts to measure its mass and other properties.

**Weeks 4-5: *A close look at Gravity.*** Can gravity on short length scales find hidden spatial dimensions? Is there such a thing as 'quantum gravity'? Does gravity depend on chemical composition? Physicists from the UW's Center for Experimental Nuclear Physics and Astrophysics will tell you about their high-precision measurements of gravitational interaction.

**Weeks 6-8: *Nanophysics and Nanodevices.*** Nanotechnology is revolutionizing basic and applied research in addition to rapidly spawning new commercial products. UW Physicists will discuss their work in nanoscience: how do you see nanoparticles? What does quantum mechanics tell us about the electronic and magnetic behavior of small clusters of atoms? What is the future of nanoelectronics?

**Weeks 9-10: *Computing in Physics.*** Large-scale computing is revolutionizing many branches of theoretical physics by enabling calculations that were not possible a few years ago. UW faculty will discuss new approaches to performing quantum-mechanical calculations for the motion of electrons in solids and also classical-mechanical calculations of the evolution of galaxies.