

Summer Faculty Workshops

Paradigms in Physics

Quantum Mechanics in the Paradigms

Oregon State University, Corvallis, Oregon

August 6-9, 2006 (Note Date Change)

Conducted by:

David McIntyre and Corinne Manogue

Description of the Workshops

The Paradigms in Physics Project, begun in 1997 at Oregon State University, is a complete revision of the upper-division physics curriculum. By tying the content of our junior year courses to case studies of paradigmatic physical situations, we have made the curriculum more modern and flexible enough to meet students' diverse career needs. By utilizing more student-centered pedagogies including integrated laboratories, small-group problem-solving, computer simulations, and project-based courses, we have improved students' analytical and problem-solving abilities, as well as their integration of mathematics and physics.

As part of an NSF-supported Educational Materials Development project, the Oregon State University Physics Department is hosting a faculty development workshop during summer 2006. This workshop is focused on the quantum mechanics aspect of the Paradigms curriculum. In our modular curriculum we cover quantum mechanics in four of the nine modules we teach: Spin & Quantum Measurement, Waves, Central Forces, and Periodic Systems. This workshop will provide participants with an overview of the complete Paradigms curriculum, detailed information about the quantum courses, and hands-on experience with the student engagement activities used in these courses. Particular emphasis will be placed on the Spin & Quantum Measurement course, which is an introduction to quantum mechanics through the analysis of sequential Stern-Gerlach spin measurements, and the Central Forces course, which covers both classical and quantum mechanical solutions to the three-dimensional central force problem. The quantum topics covered in this workshop are appropriate for a first semester quantum course in a traditional curriculum.

The costs of housing and meals in Corvallis are provided by an NSF grant. Participants must underwrite transportation costs. Participants will receive course materials and instructor's guides on paper and CD ROM. The workshop begins with dinner and introductions on Sunday evening August 6 and concludes with summary discussions Wednesday evening August 9. Housing will be in a hotel within walking distance of the workshop.

Additional information on the Paradigms project and on the two courses in particular can be obtained by phone (Corinne Manogue 541-737-1695) or at the following web sites:

Paradigms: <http://www.physics.oregonstate.edu/paradigms>

Spin & QM: <http://www.physics.orst.edu/~mcintyre/ph425>

Central Forces: <http://www.physics.orst.edu/ph426>

