



Fall Seminar Series

3:30pm - 4:30pm, Wednesday, October 17, 2012

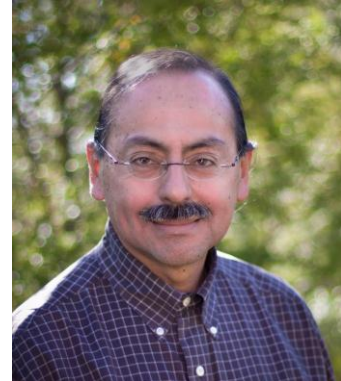
Johnston Hall, Room 338

Neutron Scattering at the Spallation Neutron Source and the High-Flux Isotope Reactor in Oak Ridge National Laboratory

by

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Neutrons have unique properties that make them an ideal probe of condensed matter systems. They have wavelengths and energies comparable to the typical atomic distances and collective excitations in solids, making them suitable to study the crystalline structures and the dynamics of materials. They have no electric charge which gives them the ability to penetrate to the bulk of most materials. Neutrons also have a magnetic moment which makes them very useful to study the magnetic structures and magnetic excitations in magnetic materials. Unlike x-rays neutrons are very sensitive to study light elements and this makes them an useful probe of biological materials. In this talk I will present the history of neutron scattering and describe the properties that make neutrons unique to study materials. I will also present examples of recent research in the study novel materials and discuss the opportunities of scientific research, mentoring and training at two major scientific user facilities in the US: the Spallation Neutron Source (SNS) and the High Flux Isotope Reactor (HFIR) at Oak Ridge National Laboratory. The SNS is the world's most intense pulsed accelerator-based neutron source; the HFIR is the highest flux reactor-based neutron source for condensed matter research in the United States.

The SNS and the HFIR at SNS are funded by the Division of Scientific User Facilities, Office of Basic Energy Sciences, US Department of Energy.

Dr. Jaime Fernandez-Baca is Senior Research Staff Member in Oak Ridge National Laboratory's Quantum Condensed matter Division. He has over 25 years of experience in the study the magnetic ordering and spin dynamics of complex oxides and related alloys utilizing neutron scattering techniques. His most recent interest is in the study of colossal magnetoresistive oxides and multiferroic materials. He is the author or coauthor of 110 technical articles, and has presented numerous invited lectures at national and international technical conferences, as well as many technical seminars and tutorials at national and international academic institutions. Dr. Fernandez-Baca holds a PhD in Physics from the University of Maryland, College Park. He is an elected member of the Executive Committee of the Neutron Scattering Society of America and a member of the American Physical Society.