CHiMaD | Center for Hierarchical Materials Design

SPECIAL SEMINAR

Field Method of Simulation of Phase Transformations in Materials

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May 21, 2014 (Wednesday)
COOK Hall, Rm 2058 | **1.00pm-2.00pm**
Cookies will be provided as snacks

ABSTRACT Recently, there has been a surge to study materials transformations using multiscale modeling techniques. This has come about as the recognition that the macroscopic properties of materials originate at the atomistic level and develop in complexity all the way to the macroscopic manifestation. As the atomistic simulations of these processes are often prohibitively expensive, researchers seek more efficient methods which would be able to describe material's structure on many different levels. Continuum methods, in the form of partial differential equations describing the conservation laws and constitutive relations, have always been appealing due to their simplicity, efficiency, and versatility. These approaches have been impressively successful in a number of areas, such as solid and fluid mechanics.

In this presentation you'll learn about the Field Method that offers enormous computational efficiency in multiscale structural-evolution modeling of the materials and their response to applied fields. The Field Method automatically reproduces spontaneous micro-structural self-organization. It has the potential to be an effective tool for future computational engineering of microstructures and materials properties in structural materials.

Alexander Umantsev *is a Professor of Physics in the Department of Chemistry and Physics at Fayetteville State University. He was educated in Russia at first at the Moscow Institute for Physics and Technology and then Institute of Transportation Engineering. He received his Ph.D. from the National Lab for Metallurgy in Moscow. Dr. Umantsev came to this country in 1989 as a Post Doctoral Fellow and then Research Associate at Northwestern University. He came to FSU in 2002 from Northern Arizona University in Flagstaff. Dr. Umantsev published more than 50 papers and book chapters on different subjects of condensed-, soft-matter, computational materials physics, and biophysics.*