



2007 - 2008



**MATHEMATICS COLLOQUIUM SERIES
UNIVERSITY OF CENTRAL FLORIDA**

**Professor Weiqing Ren
Courant Institute of Mathematical Sciences
New York University**

will speak on

Transition Pathways in Complex Systems

ABSTRACT: Many problems in material sciences, physics, chemistry and biology can be abstractly formulated as a system that navigates over a complex energy landscape of high or infinite dimensions. Well-known examples include phase transitions of condensed matter, conformational changes of biomolecules, and chemical reactions. The energy landscape typically exhibits multiscale features, giving rise to the multiscale nature of the dynamics. The analysis of the transition pathways in such systems is a major challenge that we face in computational science.

The string method proposed recently by E. Ren and Vanden-Eijnden is an effective way of identifying transition mechanisms and transition rates between metastable states in systems with complex energy landscapes. In this talk, I will discuss the theoretical background and algorithmic details of the method, as well as its applications to micromagnetics and isomerization reaction of the alanine dipeptide.

DATE: Thursday, March 27, 2008
TIME: 10:30am – 11:30am
PLACE: MAP 318

Refreshments will be served