Physics Department Seminar

Friday March 5th, 2010

11:00am in PhSc 108

"Scaling in a model of material damage with healing "

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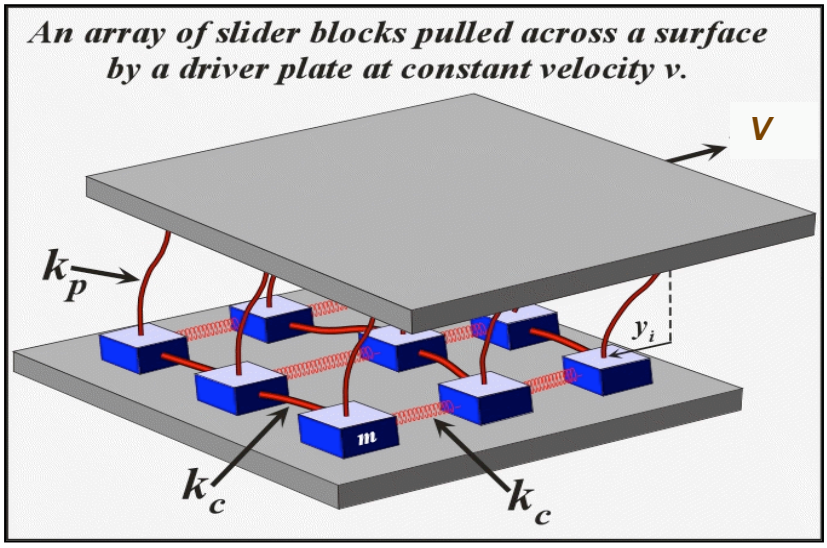

Abstract:

A variety of studies have modeled the physics of material deformation and damage as examples of generalized phase transitions. This talk will focus on a particular model, the cellular automaton slider-block model also known as the Rundle-Jackson-Brown (RJB) model or the Olami-Feder-Christensen (OFC) model. The model incorporates long range interactions and recurrent damage that is parameterized by a process of threshold weakening and partial healing during sliding. The resulting behavior is mapped onto a percolation transition and the scaling exponents are, within measurement error, the same as for mean-field percolation. The effects of boundary conditions will also be examined.