

DEPARTMENT OF

ENGINEERING MECHANICS

COLLEGE OF ENGINEERING

Spring 2010 Seminar Series

Statistical mechanics and peridynamic boundary value problems

Richard B. Lehoucq

Sandia National Laboratories

Albuquerque, NM

rblehou@sandia.gov

<http://www.sandia.gov/~rblehou>

*Co-Sponsored by the Nebraska Center for Materials and Nanoscience and
the Department of Engineering Mechanics*

My presentation derives the peridynamic momentum and energy balances using the principles of statistical mechanics. In particular, I show that the peridynamic force density integral operator is the phase space expected value of internal force density given by a general multibody interatomic potential. The derivations generalize the seminal work of Irving-Kirkwood (1950), and builds upon the elegant ideas due to Noll (1955) and Hardy (1982) that generalized the former work.

The remainder of my presentation (briefly) reviews recent work on establishing the well-posedness of the equilibrium equation for the linear peridynamic state boundary value problem. This involves the development of a nonlocal vector calculus.

Tuesday, April 20, 2010

3:30 PM

105 Othmer Hall

There will be a reception in W317.7 NH at 3:00 PM, preceding the seminar.
For More Information contact: Dr. Florin Bobaru, 402-472-8348, fbobaru2@unl.edu

UNIVERSITY OF
Nebraska
Lincoln