

1046-60-1912

Maria Emelianenko* (memelian@gmu.edu), Dept. of Math. Sciences, MS: 3F2, George Mason University, 4400 University Drive, Fairfax, VA 22031, and **David Kinderlehrer** and **Dmitry Golovaty**. *Nonlinear dynamical phenomena in mesoscale modeling of polycrystals.*

Polycrystalline materials are important in many technological applications, yet there are still many challenges they present for mathematical modeling and analysis. One such challenge lies in understanding how statistical distributions develop in the process of coarsening of materials microstructure and how these distributions in turn relate to materials properties. In this talk, we will discuss and compare several recent continuum level models resulting in nonlinear evolution equations. Special focus will be placed on newly discovered features of interface dynamics that connect this problem to the theory of nonhomogeneous Poisson processes in industrial applications and Boltzmann equations in statistical physics. Numerical and analytical characteristics of the solutions will be discussed and compared against the results produced by experiments and large-scale simulations. (Received September 16, 2008)