1051-35-254 **Serge Prudhome*** (serge@ices.utexas.edu), 1 University Station C0200, Austin, TX 78735, and **J. Tinsley Oden**, **Andrea Hawkins** and **Kris van der Zee**. *Modeling and Numerical Simulation of Tumor Growth.*

While a large and growing literature exists on mathematical and computational models of tumor growth, to date tumor growth models are largely qualitative in nature, and fall far short of being able to provide predictive results important in life-and-death decisions. This is largely due to the enormous complexity of evolving biological and chemical processes in living tissue and the complex interactions of many cellular and vascular constituents in living organisms. Significant progress in this important area could however be foreseen thanks to the development of so-called phase-field, or diffusive interface models, which can be developed using continuum mixture theory, and which provide a general framework for modeling the action of multiple interacting constituents. These are based on generalizations of the Cahn-Hilliard models and have been used recently in certain tumor growth theories. In this talk, we describe a general phenomenological thermomechanical theory of mixtures that employs phase-field or diffuse interface models of surface energies and reactions and present preliminary numerical simulations for tumor growth modeling. (Received August 25, 2009)