1011-74-266　　　　　**Lawrence Schovanec*** (`schov@math.ttu.edu`), Department of Mathematics & Statistics, Texas Tech University, Lubbock, TX 79409, and **Alan Barhorst**, Department of Mechanical Engineering, Texas Tech University, Lubbock, TX 79409. *Modeling Hybrid Parameter Multiple Body Systems with Application to Biomechanics.*

This talk will address an approach for modeling nonholonomic hybrid parameter multiple body systems in order to account for the combination of rigid body dynamics and elastic motions in systems. The method allows for continuum bodies to be represented with the postulates associated with non-linear theories, such as Timoshenko-like beams as well as higher order plate and shell theories. The variational nature of the approach provides for the derivation of the nonlinear hybrid differential equations and the boundary conditions. Pseudo-coordinates and pseudo-speeds are used to allow for the inclusion of holonomic or nonholonomic constraints that occur among the hybrid parameter bodies, including intra-domain constraints. Applications of the methodology to problems arising in biomechanics are presented. (Received August 29, 2005)