



Aerospace and Mechanical Engineering Seminar

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Analytical Treatment of Non-Hertzian Contact Problems

Construction of analytical solutions for contact problems that take into account the real curvatures of contacting bodies, without resorting to Hertzian approximation using half-spaces, represents one of the intrinsic challenges of the contact mechanics. Likewise, development of a universally recognized model that would comprehensively describe the frictional contact interaction has been another longstanding problem of the field. In this talk, analytical approaches enabling rigorous treatment of non-Hertzian contact problems with taking into account real geometry of contacting bodies, friction and adhesion will be discussed. The following problems will be highlighted: (i) contact of the elastic spheres; (ii) indentation with friction and adhesion of a rigid cylinder into an elastic half-space; (iii) indentation with friction of a rigid sphere into an elastic half-space; (iv) fully 3D contact problem for a transversely isotropic half-space indented by a rigid sphere.

Bio:

Dr. Zhupanska is a Professor in the Department of Aerospace and Mechanical Engineering at the University of Arizona. She received her Ph.D. in Mechanics of Solids and Applied Mathematics from Kiev University (Kiev, Ukraine) in 2000. Dr. Zhupanska's research interests are in the general area of mechanics of solids with a particular emphasis on mechanics of composites, multiphysics problems related to composites, and contact mechanics. Her work has been recognized by a number of the awards including the DARPA Young Faculty Award, ASME/Boeing Award, and National Research Council (NRC) Senior Research Associateship Award.

AME Lecture Hall, Room S212

Thursday, August 31, 2017

4:00 pm

Refreshments and socializing 3:45 pm at the east end of the AME Courtyard