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Seminar über Fragen der Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Dienstag, **24.10.2017, 14:15 Uhr**, Egerlandstr. 5, Raum 0.044

The Gurtin-Murdoch and Steigmann-Ogden models vis-à-vis the Benveniste-Miloh interface regimes

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It is well recognized that surface and interface effects play a crucial role in understanding various small-scale related phenomena. This talk (based on the results of the collaborative work with Prof. Zemlyanova) is concerned with the analysis of the two models of material surfaces: celebrated Gurtin and Murdoch (1975, 1978) model and less studied model of Steigmann and Ogden (1997, 1999). In both models, the material surface is treated as an isotropic layer of vanishing thickness that adheres to the bulk without slipping and possesses its own mechanical properties and surface tension. In Gurtin-Murdoch model, these properties are characterized by the surface shear modulus and Lamé parameter, while Steigmann and Ogden model also accounts for the bending interface effects. Mathematically this means that the surface energy in the Steigmann-Ogden form depends both on the surface strain tensor and the surface curvature tensor. Theoretically, the Steigmann-Ogden model reduces to the Gurtin-Murdoch one, when the bending interphase effects are neglected. However, the analysis of analytical solutions of Eshelby problems for the two models suggests that this reduction cannot be done by just formally allowing the bending parameters vanish, as the two models describe two distinct interphase regimes of seven regimes proposed by Benveniste and Miloh (2001). The implications of this fact will be discussed.

Bio. Prof. Mogilevskaya received her PhD in Engineering Mechanics from the Scotchinsky Research Institute of Mining (Russian Academy of Sciences, Moscow) in 1987. She is currently a Research Professor and the Member of Graduate Faculty in the Department of Civil, Environmental, and Geo- Engineering at the University of Minnesota. She has published over 75 archival journal papers and coauthored a chapter in a book on complex hypersingular BEM in plane elasticity problems. She teaches a graduate course on the Boundary Element Methods.

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