

TOUGHNESS AND STRENGTH IN NANOSCALE MATERIALS 1100 - ATOMISTIC, NANO AND MICRO MECHANICS OF MATERIALS

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Key words: Crack Nucleation, Crack Propagation, Toughness, Strength, Nanomaterials

ABSTRACT

Nanoscale materials (such as nanowires, nanotubes, and 2D materials) have a number of critical applications in a range of areas including nanoelectronics, energy, defense, aerospace, biotechnology, and nanocomposites [1, 2, 3]. In spite of decades-long developments in the field of fracture mechanics, it remains a challenge to describe and predict the condition for crack nucleation and propagation in nanoscale materials, due to intricate correlations among surface energetics, topological defects, porosity, and heterogeneity at multiple scales that span nanometer to micrometer level length scales. This minisymposium invites researchers and experts in the field to discuss recent developments and state-of-the-art practices used to investigate and understand the criteria for crack nucleation and propagation in 1D and 2D materials. There will be two sessions in this minisymposium. The first session will focus on crack nucleation and propagation in 1D materials (nanowires, nanotubes), while the second session will focus on crack nucleation and propagation in 2D materials (such as graphene). The talks are expected to cover theoretical, computational, and experimental research on fracture and failure mechanisms in nanoscale materials. Keynote speakers for the minisymposium will include: (a) Prof. Stefano Zapperi, Center for Complexity and Biosystems, Department of Physics, University of Milan, Italy and (b) Tobin Filleter, Erwin Edward Hart Professor of Mechanical Industrial Engineering, University of Toronto, Canada.

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