

Special Issue

**CRACK INITIATION AND PROPAGATION AT NANO AND MESOSCOPIC
LEVELS: THEORY AND APPLICATIONS****Filippo Berto¹****AIM AND SCOPE**

In many physical and mechanical systems the precise nature of dissipative processes varies depending on the scale of consideration. At the macroscopic, or continuum scale these phenomena are represented through the introduction of complex constitutive laws. These continuum quantities reflect the consequences of dissipative processes that take place at lower structural scales, e.g. intergranular and intragranular deformation in metallic polycrystals, interfacial decohesion processes in ceramic aggregates, crystalline and amorphous phases in polymers. The introduction of mesoscale considerations aims to provide a connection between fine scale analyses and large scale, homogenized treatments. Multi-scale analyses attempt to link the scales by communicating the necessary quantities between different levels of description. The special issue is aimed to summarise recent findings in the field of mesomechanics paying particular attention to the theoretical basis and specific applications.

Keywords: *nanoscale, crack, strain energy density, thin films*

SUBTOPICS

1	Physical mesomechanics	4	Volume and Surface Energy
2	Heterogeneous media	5	Fracture at different scales
3	Nano-scale thin films	6	Dissipative processes

SCHEDULE

Manuscript submission deadline	30 September 2014
Peer Review Due	15 October 2014
Revision Due	30 October 2014
Notification of acceptance by the Guest Editor	15 November 2014
Final manuscripts due	30 November 2014

¹ Department of Management and Engineering, University of Padua, Italy
e-mail address: berto@gest.unipd.it