Istituto di Analisi Numerica del CNR
Dipartimento di Matematica “Felice Casorati”
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Seminario di Matematica Applicata

Martedì 4 Febbraio alle ore 16.00 nella Sala Conferenze dell’I.M.A.T.I. del CNR (sezione di Pavia – ex I.A.N.) il

Prof. Giampietro Del Piero
(Università di Ferrara)

terrà la conferenza:

Local energy minimizers for elastic bars with cohesive energy

Abstract. At the level of constitutive equations relating macroscopic stress and strain measures, real materials exhibit a variety of behaviors. In the years, there was a tendency to focus on some prominent properties of material response and to study them individually; the result was the development of independent, sometimes unrelated, branches of continuum mechanics, such as fracture mechanics, damage, and many theories sharing the name of plasticity. Some hope for recovering a unified view is provided by a model based on the assumption that the total energy of a body is the sum of two parts, a bulk part representing the elastic strain energy and a cohesive part associated with defects occurring at both macroscopic and microscopic level. Energy minimization provides a number of stable and metastable equilibrium curves, whose shape strongly depends on the analytic expression assumed for the surface energy. Different expressions reproduce different types of material behavior. The wide range covered by the model may contribute in establishing a link between macroscopic response of bodies of finite size and microscopic properties of the constituent materials. At the present stage, the model has been applied to one-dimensional, homogeneous bars with prescribed displacements at the ends. Non-homogeneous bars subject to applied body forces have been considered recently. Two and three-dimensional generalizations present considerable difficulties, both in mechanical modeling and in mathematical setting. The present communication is an updated review of the state of the research, with emphasis on some peculiar aspects of the mathematical structure of the model.

La S.V. è cordialmente invitata.

☕ Dopo la conferenza verrà offerto ai partecipanti un piccolo rinfresco.