UNIVERSITÀ DEGLI STUDI DI TRENTO

Dipartimento di Ingegneria Civile, Ambientale e Meccanica

INSTABILITIES

Instabilities and nonlocal multiscale modelling of materials

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AVVISO DI SEMINARIO

Si comunica che **giovedì 15 settembre 2016 a partire dalle ore 11.00**
si terrà presso l'aula **R2** (via Mesiano 77) il seguente seminario

# Dynamic Eshelby Micromechanics (with inertia effects)

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"Eshelby micromechanics" can be called the micromechanics based on the two celebrated Eshelby papers: The "force on an elastic singularity", or "Eshelby force" (1951), (associated with Noether's theorem and conserved integrals) and the ellipsoidal inclusion with transformation strain (1957) where the Eshelby Tensor allows for the solution of inhomogeneities as well. Both of these Eshelby micromechanics building blocks are extended to dynamics with inertia. Based on dimensional analysis alone and analytic properties, as well as on the full field solution, it is shown that self-similarly expanding Eshelby inclusions preserve the constant stress Eshelby property in the interior domain. The Dynamic Eshelby Tensor for *self-similarly* expanding ellipsoidal inclusions is presented and the static Eshelby Tensor is obtained from it by a limiting procedure. The elastodynamic evolution of moving defects (dislocations, expanding inclusion and inhomogeneity boundaries) is governed by the dynamic conservation laws (*J, L, M* integrals) from Noether's theorem yielding the "kinetic relations" due to inertia. For a solid containing a periodic distribution of defects, in the unit cell the defects evolve by Eshelby mechanics (J, L, M integrals) and this is carried to the macroscopic scale as macroscopic damage by asymptotic homogenization.

Tutti gli interessati sono invitati a partecipare.

Il seminario è organizzato dal gruppo di Scienza delle Costruzioni
(D. Bigoni, L. Deseri, N.Pugno, A. Piccolroaz, F. Dal Corso, M.F. Pantano, R. Springhetti)
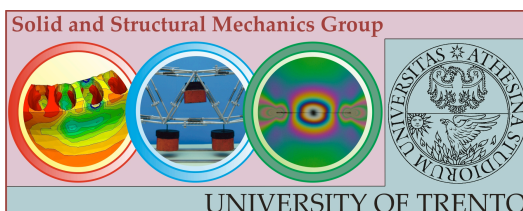
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