UNIVERSITÀ DEGLI STUDI DI TRENTO
Dipartimento di Ingegneria Civile, Ambientale e Meccanica

Instabilities and nonlocal multiscale modelling of materials
erc-instabilities.unitn.it

European Research Council
Established by the European Commission

AVVISO DI SEMINARIO

Si comunica che **venerdì 27 febbraio 2014 a partire dalle ore 10.30**
si terrà presso l'aula **Q2** (via Mesiano 77) il seguente seminario

General asymptotic theory for periodic structures: Connecting the Microstructure to the Macroscale
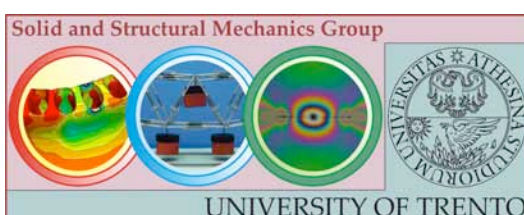
Dr. Mehul Makwana

Imperial College London

An asymptotic procedure based upon a two-scale approach is developed for wave propagation in a doubly periodic inhomogeneous medium with a characteristic length scale of microstructure far less than that of the macrostructure.
This method extends the range of validity of classical homogenization theory by considering frequencies which do not belong to the low-frequency range. The resulting long-wave equations are deduced only explicitly dependent upon the macroscale, with the microscale implicitly defined within the coefficients of the resulting equation.

Initially we consider discrete lattices where the accuracy of these continuum effective medium equations of the periodic structure is demonstrated versus numerical simulations. Subsequently we show that the homogenization of a semi-discrete elastic string structure, consisting of repeated hexagonal cells, is shown to coincide very closely with its discrete lattice counterpart. Finally, we outline the general theory for continuous media and show how the frequency-dependent anisotropy present is perfectly captured by our high-frequency homogenization method.

Tutti gli interessati sono invitati a partecipare.

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