A V V I S O   D I   S E M I N A R I

Nell'ambito delle iniziative promosse dalla *Scuola di Dottorato in Ingegneria "Leonardo da Vinci"*, d'intesa con il *Dottorato Internazionale in "Civil and Environmental Engineering"* e l'*IMT – School for Advanced Studies Lucca*

venerdì 15 aprile 2016 alle ore 11:00 saranno tenuti i seguenti seminari:

Marco PAGGI
Professore Associato di Scienza delle Costruzioni
presso l'**IMT – School for Advanced Studies Lucca**

Computational methods for interface mechanical problems

Abstract. The present seminar proposes an overview of computational methods for the simulation of fracture mechanics problems, contact mechanics, and for the characterization of degradation phenomena in laminates under the action of multiple fields. Case studies show the application of the proposed numerical methods developed within the research unit MUSAM on Multi-Scale Analysis of Materials of the IMT School for Advanced Studies Lucca to: (i) crack propagation under the action of thermo-mechanical loads; (ii) hygro-thermo-mechanical modelling of polymeric layers; (iii) peeling of fibrillar interfaces undergoing large displacements; (iv) fracture and instabilities of thermal barrier coatings; (v) experiments and simulation of fluid flow and leakage across rough surfaces in contact.

Andrea BACIGALUPO
Ricercatore di Scienza delle Costruzioni
presso l'**IMT – School for Advanced Studies Lucca**

Non-local dynamic homogenization of periodic materials and metamaterials: overall mechanical properties, band structure and acoustic behavior

Abstract. A non-local dynamic homogenization procedure for the analysis of wave propagation in materials and metamaterials with periodic microstructure is described. By a variational-asymptotic homogenization technique a non-local continuum model is derived, which provides an accurate simulation of for a wide range of wavelengths and a useful tool for the wave propagation analysis in bounded and unbounded domains. This approach is applied to the study of wave propagation in layered materials and auxetic metamaterials. The dispersion functions, obtained by the non-local model, are compared with those rigorously derived by the Floquet-Bloch theory. Through generalizations of the down-scaling relations multi-physics asymptotic homogenization methods may be derived. This approach is applied for the analysis of periodic materials in presence of thermodiffusion and the exact expressions for the overall elastic and thermodiffusive constants of the equivalent non-local thermodiffusive continuum are derived.

I seminari saranno tenuti presso l'Aula Pacinotti della Scuola di Ingegneria.

Referente dell'invito: Paolo S. Valvo.

Pisa, 16 marzo 2016.

Il Direttore della Scuola
(Prof. Ing. Stefano Bennati)