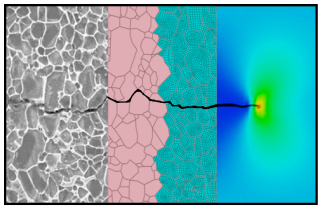
UNIVERSITÀ DEGLI STUDI
DI TRENTO
Dipartimento di Ingegneria Civile,
Ambientale e Meccanica



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MARIE CURIE ACTIONS
PEOPLE

AVVISO DI SEMINARIO

Si comunica che **martedì 25 luglio alle ore 16.30**
si terrà presso l'aula **R2** (via Mesiano 77) il seguente corso

How to Implement Aleatory Uncertainty in Computational Mechanics

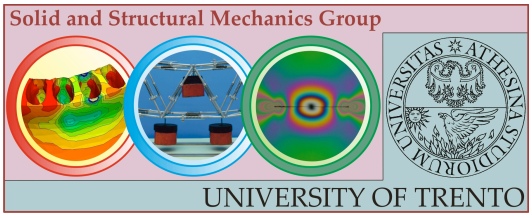
Prof. Rebecca Brannon

University of Utah, Salt Lake City, UT

Scale-dependent statistical seeding of material strength (or other material properties) is undeniably necessary to generate realistic mesh-insensitive numerical predictions of brittle failure. Without it, for, example, you would never be able to properly model bifurcations such as buckling, radial cracks, etc. To gain intuition about the basic features to expect in statistically perturbed simulations, we look at classical LEFM applied to a penny-shaped crack for which the only statistically uncertain attributes are orientation and size. The result is a scale-dependent family of strength surfaces instead of the deterministic "distorted hexagon" of a conventional Mohr-Coulomb that would result from the same theory without aleatory uncertainty. Recognizing that idealized models are not predictive, methods (including "data-delocalization") to interpret and faithfully reproduce similar features in actual data are reviewed. The subsequent need for "data-relocalization" in implementations is described as well. High-fidelity models attempt to discretize microphysical data (such as distributions of dislocation or crack size and orientation) in order to more directly reproduce evolving macroscale CDFs for material properties. Such methods, if applied directly, represent an untenable burden on computational memory and processing time. An algorithmically simple method is described for optimally binning of millions of data points down to a manageable number of about 100. Numerous examples from geomechanics and ceramics modeling are provided throughout this talk.

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, F. Dal Corso, A. Piccolroaz, D. Misseroni, R. Springhetti)



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