



UNIVERSITÀ DEGLI STUDI
DI TRENTO

Dipartimento di Ingegneria Civile,
Ambientale e Meccanica



Instabilities and nonlocal
multiscale modelling of
materials

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AVVISO DI SEMINARIO

Si comunica che **venerdì 15 maggio 2015 a partire dalle ore 11.00**
si terrà presso l'aula **Q2** (via Mesiano 77) il seguente seminario

Determination of real area of contact and elastostatic friction for self-affine surfaces by means of the finite element method

Dr. Alessandro Rigazzi

Institute of Computational Science, University of Lugano

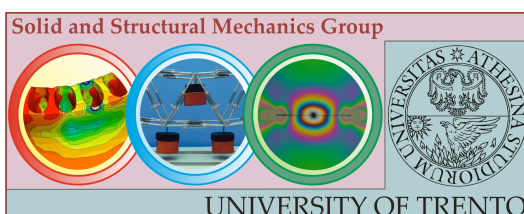
Every natural surface is - at some length scale - rough. Thus, contact never happens in smooth and continuous zones: it happens in small and fragmented islands, and is heavily influenced by the microscopic geometry of the surface asperities.

Employing numerical simulations of frictionless contact problems, we studied the behavior of a smooth elastic cube pressed onto different rigid self-affine surfaces replicating rock substrates. We quantified the influence of several roughness and elasticity parameters on two macroscopic contact features: real area of contact and elastostatic friction. This implied solving a contact problem at microscopic resolution, on a macroscopic domain. At this end, we applied the Finite Element Method on high-resolution meshes.

Solving the resulting nonsmooth constrained optimization problems, with millions of unknowns, was possible only thanks to our massively parallel multigrid-based contact solver, which is proved to scale reasonably on up to 4'096 processors.

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)



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