



UNIVERSITÀ DEGLI STUDI
DI TRENTO

Dipartimento di Ingegneria Civile,
Ambientale e Meccanica



Mechanics of refractory
materials at high-temperature
for advanced industrial
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AVVISO DI CORSO

Si comunica che **venerdì 20 giugno alle ore 11.00**
si terrà presso l'aula **R2** (via Mesiano 77) il seguente corso

CHEMO-MECHANICAL PROCESSES IN GEOMATERIALS: concepts & modeling

Prof. Tomasz Hueckel

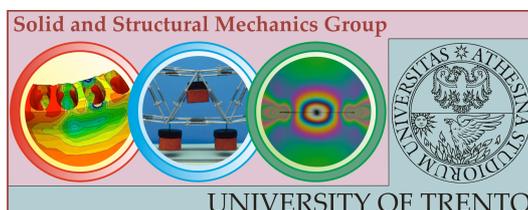
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Geomaterials respond to some environmental circumstances through generation of a series of (often self-regulatory) mechanisms of damage, deformation, erosion, and chemical processes or reactions: e.g. osmosis, dissolution and precipitation. These mechanisms are coupled at different scales. Several natural geomechanical processes, as sediment compaction, rock weathering, landsliding or sinkholes appear to include such sequences of mechanisms. The focus of the presentation is on the understanding variables and mechanisms that are critical in affecting material deformability, strength, and permeability. A principal distinction among such mechanisms is in analogy to solute transport between non-reactive and reactive coupling. The first class includes processes related to a change in ionic content of pore water, nearly instantaneous, or at most controlled by advection-diffusion, while the second class embraces reactive processes, controlled by the rate constants. As in most cases the processes affect geomaterials irreversibly, the modeling tool of choice is plasticity, which is for this purpose renamed as "chemo-plasticity". The key assumption about that is that yielding depends on the change of mass of species critically affecting the solid: ions in the solution, dissolving minerals, polymerizing suspensions, and similar.

We discuss several cases of interest that address: effects of change in ion concentration in homo-ionic clays, specific mechanisms taking place at the grain boundaries, including silica dissolution and polymerization, calcite dissolution and precipitation, and the effect on sediment stiffening and decrease in permeability, a case of clay transformation due to acid rain leading to massive landslides, as well as a set of possible feedback mechanisms self-regulating the chemo-mechanical coupling.

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, R. Springhetti)



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