UNIVERSITÀ DI TRENTO

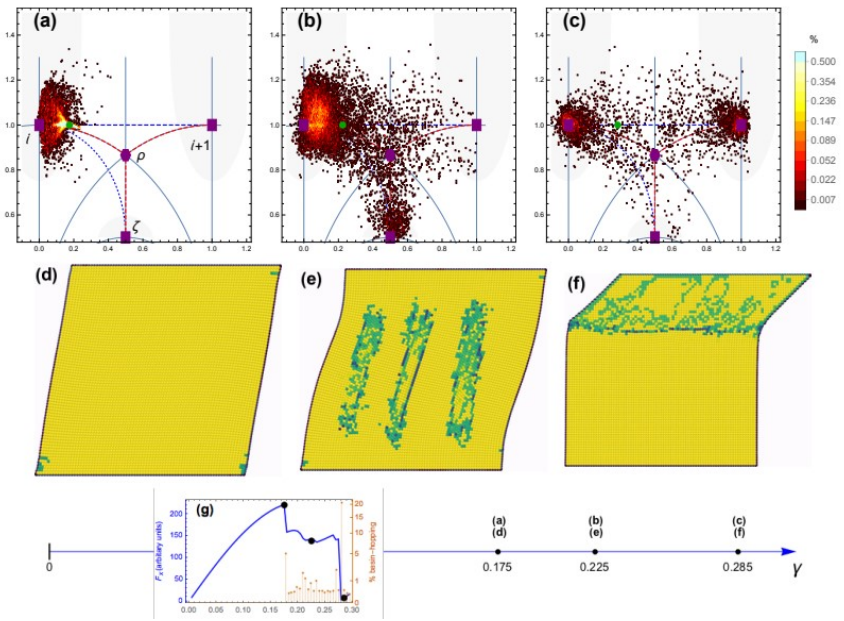
Elasticity and Plasticity in Crystalline Hyperelastic Materials

Prof. Paolo Biscari

Department of Physics, Politecnico di Milano, Italy

when	**28 February 2023**
time	**11.00 –11.30**
where	**2R, DICAM, Mesiano**

The material symmetry GL(n,Z) which characterizes crystalline solids imposes the construction of an elastic energy that satisfies the appropriate periodicity requirement.
In 2D the modular forms allow explicitly deriving analytic expressions for both the study of the plastic flow and the solid-solid transitions of materials with multiple stable lattices, such as shape memory alloys.
The results of numerical simulations, which show the effects, will be presented and discussed in the talk.



Simulation of plastic flow initiation in a square crystal on the Dedekind tessellation of H. The imposed loading is along a primary shear direction in the lattice, parallel to the driven horizontal body-sides. The three simulation snapshots (a), (b), (c) show the evolution of the strain clustering during plastification. Panels (d), (e), (f) show the corresponding body-shape change.

The seminar is organized by the Solid and Structural Mechanics Group [D. Bigoni, F. Dal Corso, L. Deseri, D. Misseroni, M.F. Pantano, A. Piccolroaz, N.Pugno, R. Springhetti]