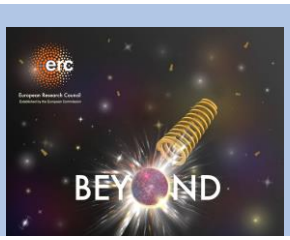

UNIVERSITÀ DI TRENTO

Stress increases with strain in idealized isotropic nonlinear elasticity

Patrizio Neff

University Duisburg-Essen, Germany

Date	**October 24, 2024**
Time	**15:30**
Room	**2F, DICAM, Mesiano**

I propose a new constitutive condition for the Cauchy stress-strain law in isotropic nonlinear elasticity. The condition expresses „stress increases with strain“ in the form of monotonicity of the map log V → sigma(log V), i.e.

$$\langle \mathrm{sigma}(\log V_1)-\mathrm{sigma}(\log V2), \log V_1-\log V_2\rangle > 0 \quad (1)$$

The new condition will be motivated from a rate-formulation of nonlinear elasticity, using corotational derivatives and stipulating that the induced tangent stiffness tensor is positive definite. A noteworthy feature is that the result is practically independent of the used corotational rate, transferring to (1) a far reaching generality.

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]