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Centro di Simulazione Numerica Avanzata – CeSNA  
Istituto Universitario di Studi Superiori

## Mechanics of nematic elastomers: modeling, analysis, and numerical simulation

SEMINAR

Nematic elastomers are systems which combine optical properties of nematic liquid crystals with the mechanical properties of rubbery solids.

They display phase transformations, material instabilities, and microstructures.

These phenomena are related to the formation of elastic shear bands which are reminiscent of mechanical twinning in shape-memory alloys. The richness of the underlying material symmetries makes the mathematical analysis of this system particularly rewarding.

In this talk, we will review the recent progress on the modelling of nematic elastomers with special focus on martensitic-like microstructures and coarse-grained models for the effective mechanical response.

Our results shed light on the geometric structure of the energy landscape and we expect them to be relevant also in other, related fields, such as phase-transforming crystalline solids (magnetostrictive, ferroelectric, magnetic-shape-memory materials) and elasto-plastic materials with softening response.

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**Thursday 17 November, 9.30**  
**MS1 Conference Room,**  
**Department of Structural Mechanics,**  
**Via Ferrata,1 – Pavia**

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