



# Necas Seminar on Continuum Mechanics

Mathematics Physics

[Charles University](#)

Audience: Researchers in the topic

Seminar series time: Monday 15:40-17:10 in your time zone, Europe/Rome

Organizers: [Miloslav Feistauer](#), [Jaroslav Haslinger](#), [Martin Kruzik\\*](#), [Sarka Necasova](#)

\*contact for this listing

Upcoming talks Past talks

Your time	Speaker	Title
Mon Nov 30 15:40	<a href="#">Giuseppe Tomassetti</a>	<a href="#">Shape programming of a magnetic elastica</a>

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## Shape programming of a magnetic elastica

**[Giuseppe Tomassetti](#) (Università Roma Tre)**

**Abstract:** We consider a cantilever beam which possesses a possibly non-uniform permanent magnetization, and whose shape is controlled by an applied magnetic field. We model the beam as a plane elastic curve and we suppose that the magnetic field acts upon the beam by means of a distributed couple that pulls the magnetization towards its direction. Given a list of target shapes, we look for a design of the magnetization profile and for a list of controls such that the shapes assumed by the beam when acted upon by the controls are as close as possible to the targets, in an averaged sense. To this effect, we formulate and solve an optimal design and control problem leading to the minimization of a functional which we study by both direct and indirect methods. In particular, we prove that minimizers exist, solve the associated Lagrange-multiplier formulation (besides non-generic cases), and are unique at least for sufficiently low intensities of the controlling magnetic fields. To achieve the latter result, we use two nested fixed-point arguments relying on the Lagrange-multiplier formulation of the problem, a method which also suggests a numerical scheme. Various relevant open question are also discussed.

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Mon Nov 30, 15:40-17:10 (ended 1 minutes ago)

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Mon Nov 23 15:40	<a href="#">Charlotte Perrin</a>	<a href="#">Compressible Euler equations under a maximal density constraint</a>
Mon Nov 16 15:40	<a href="#">Jacopo Ciambella</a>	<a href="#">Fibre re-orientation in anisotropic viscoelastic materials</a>
Mon Nov 09 15:40	<a href="#">Marco Bravin</a>	<a href="#">On some properties for an incompressible, non-viscous in-out flow in a 2D domain</a>
Mon Nov 02 15:40	<a href="#">Marco Bresciani</a>	<a href="#">Linearized von Kármán theory for incompressible magnetoelastic plates</a>
Mon Oct 26 15:40	<a href="#">Edoardo Mainini</a>	<a href="#">Linearization of finite elasticity</a>
Mon Oct 19 15:40	<a href="#">Martin Doskar</a>	<a href="#">Micromorphic model for mechanical metamaterials</a>
Mon Oct 12 15:40	<a href="#">Tomas Roubicek</a>	<a href="#">The old Stefan problem in a new mechanical context</a>

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