Wave phenomena and elastic properties analysis through Finite Element Simulations (*COMSOL Multiphysics*)

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Duration in hours: 16 (4CFU)

Description

General objective:
The course aims to teach students how to carry out computer simulations related to the static and dynamic properties of complex media using COMSOL Multiphysics. The course will be carried out in presence.

Lesson 1: General information about the COMSOL software
Tuesday 9th September – Padiglione Tamburini **Aula G1.1** (9.00 – 13.00)

Number of hours: 4
Detailed description: During the first lesson, basic information about the COMSOL software will be provided with the emphasis on the modules useful from the perspective of the mechanical analysis.

Lesson 2: Mechanical reconfiguration of a structured media
Friday 12th September – Padiglione Tamburini **Aula G1.1** (9.00 – 13.00)

Number of hours: 4
Detailed description: During the second lesson, students will learn how to carry out simulations corresponding to the *quasi*-static mechanical deformation of complex structures. The static mechanical properties (e.g. Poisson's ratio, Young's modulus) of reconfigurable materials will be extracted and analysed.

Lesson 3: Wave propagation in 2D structures
Monday 15th September – Padiglione Tamburini **Aula G1.3** (9.00 – 13.00)

Number of hours: 4
Detailed description: In the third lesson, students will analyse the dynamic properties of structures. First, through the use of a unit cell with the appropriately defined boundary conditions, the phononic band structure will be determined. In addition, students will learn how to simulate the wave propagation in the 2D finite structures.

Lesson 4: Practical exercise and written test
Friday 19th September – Padiglione Tamburini **Aula G1.1** (14.30 – 18.30)

Number of hours: 4
Detailed description: In the last session, the students will carry out simulations based on an example of a predefined structure. A written test with theoretical questions will be used to evaluate student performance.

To confirm your attendance please fill in the Google Form
https://docs.google.com/forms/d/e/1FAIpQLSfooHuXJedqXmrneXJB2haJCSIq6NYCw4awyd4HQJbxd3lUMA/viewform?usp=dialog

or contact Luke Mizzi – luke.mizzi@unimore.it.