**Proposers**: Matteo Alvaro (DSTA), Alessandro Reali (DICAR), Giancarlo Sangalli (DIMAT)

**Title**: ***Computational mechanics for scientific problems***

**Aims:** The course aims at providing to PhD students in Geology, Mathematics, and Engineering a common basic background and the skills of computational mechanics tools to be applied, as a practical example, to relevant geological problems.

**Duration**: 24 hours (6 CFU)

**Period**: April 2019 (to be defined)

**Main lecturers**: Matteo Alvaro, Leonardo Casini, Guillermo Lorenzo, Matteo Maino, Mattia Mazzucchelli, Alessandro Reali, Giancarlo Sangalli, Pietro Sternai, Lorenzo Tamellini, Mattia Tani

**Candidates**: Earth Sciences, Engineering, and Mathematics PhD students (but interested PhD students from other areas are more than welcome)

**Language**: English

**Program:** The course program is subdivided into six main sections as reported below:

* Basics of deterministic and stochastic mathematical modeling (4h)
* Basics of mechanics of solids (4h)
* Geological problems at micro/meso/macro scales (4h)
* The finite element method (4h)
* Computer implementation aspects (4h)
* Simulation of geological problems with practical applications (4h)

**Final Exam**: Oral

**Tentative schedule:** Lectures will take place in **Aula Beltrami** (Department of Mathematics) from 14:00 to 18:00 (from Monday to Friday). Only on Tuesday and Thursday, lectures will take place also from 11:00 to 13:00.