GEO.MG1.7UF **Selected Topics in Mineralogy/ Applied Mineralogy**

27.03. bis 29.03.2019

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Course title: ''Practical Numerical Methods and Algorithms with Octave/Matlab''

Course description

The course will train students on how to solve common partial differential equations and what solution strategies can be applied to simulate physical and chemical processes, with general engineering examples taken from field of building materials.

Students will learn how to implement numerical methods into algorithms for their own research. The course will provide a full solution strategy approach, i.e. from a schematization and discretization of a physical problem, to a hands-on programing code implementation with Octave/Matlab and a graphical presentation of a numerical solution.

Aims (agenda)

Train students on theory and practical implementation of following numerical algorithms with Octave/Matlab:

- Day 1 (27.03.2019)
  Explicit Finite Difference (FD): transient diffusion.
- Day 2 (28.03.2019)
  Implicit solving system of algebraic equations: FD versus Method of Lines.
- Day 3 (29.03.2019)
  Particle models: cement hydration reaction kinetics and microstructural evolution
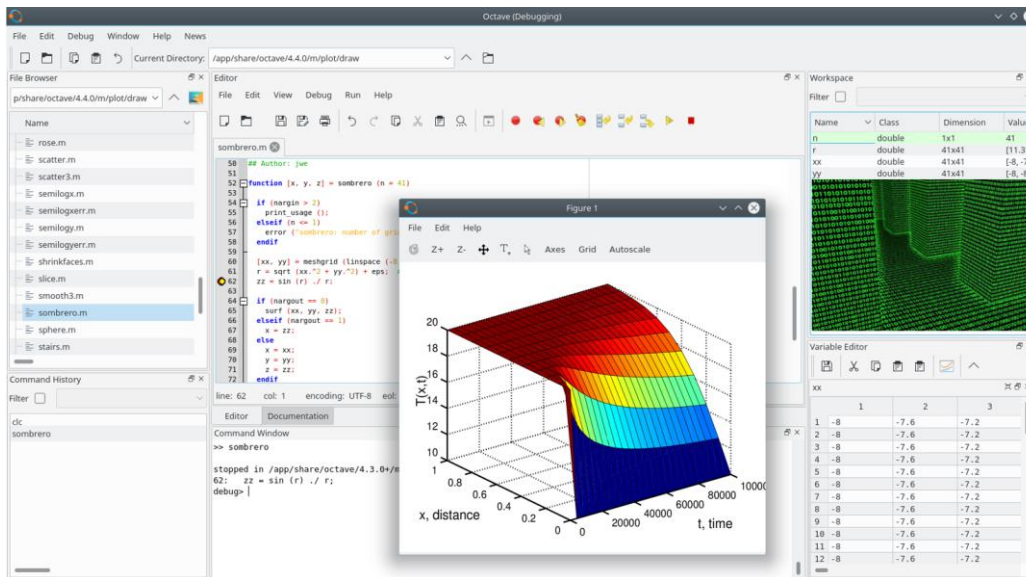
Figure:

GUI mode of free GNU Octave (compatible with Matlab), a high-level interpreted scientific programing language, intended for user friendly numerical computations.