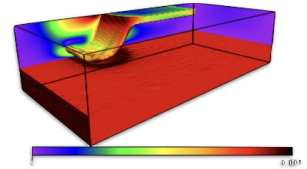


# 2018 地球动力学数值模拟公开课理论讲座日程及内容

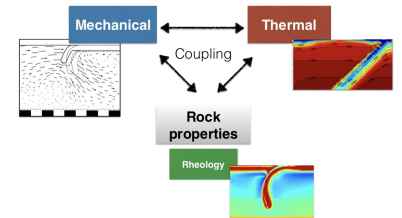
## Oct. 23<sup>th</sup>

- Class 1 Intro to Geodynamics
  - Content
    - Intro to Geodynamics
    - Models in geodynamics. Numerical Models in Geodynamics
    - Examples of models
    - Modelling Software
  - Goals
    - Get familiar with the basic processes.
    - Get familiar with some geophysical observables used to constrain Geodynamic processes.
    - Understand the role numerical modelling has in the study of geodynamic processes.



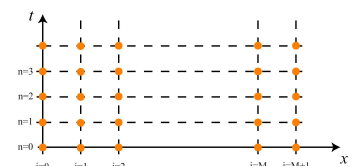
## Oct. 24<sup>th</sup>

- Class 2 Physical processes
  - Content
    - Basic processes in Geodynamical modelling.
    - Physical description of these processes.
  - Goals
    - Get familiar with the basic processes, models and conservation equations.
    - To understand the basic function of the terms present on the equations (advection, diffusion, inertia, etc).
    - To understand the assumptions and simplifications taken on Geodynamic modelling.



## Oct. 25<sup>th</sup>

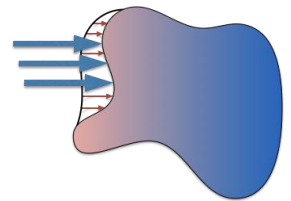
- Class 3 Numerical methods
  - Content
    - How to solve the equations using a computer: Introduction to numerical techniques.
    - Finite Differences for the heat equation.



- Comments on Finite Differences for the flow problem
- Multiphase flow problems.
- Goals
  - Understand the numerical solution of a simplified heat equation using Finite Differences (FD)
  - Understand the concept of stability of a numerical scheme

## Oct. 26<sup>th</sup>

- Class 4 Physical properties
  - Content
    - Physical properties of rocks.
    - Rheology. How rocks deform: Viscosity, Elasticity and Plasticity.
    - Density. Different models for density.
    - Dependence of viscosity and density on temperature, pressure, strain rate, etc.
    - Advanced topic: mineral physics and computational petrology.
  - Goals
    - Get familiar with basic concepts of rheology
    - To understand the role of rheology in the computational cost of numerical simulations.
    - Models for other physical properties of rocks
      - Density
      - Thermal expansivity
      - Thermal conductivity



## Oct. 27<sup>th</sup>

- Class 5 Numerical Studies
  - Content
    - Thermal evolution of the Oceanic Lithosphere.
    - Subduction dynamics and the origin of Andean orogeny.
    - Coupled mantle dripping and lateral dragging controlling the lithosphere structure of the NW-Moroccan margin and the Atlas Mountains

