

## **Postdoctoral Researcher: Numerical Modeling of Magma and Deformation in Subduction Zones**

**Location:** Geosciences Montpellier, Univ. Montpellier, France

**Duration:** 20 months

**Start Date:** Between May and November 2026 (flexible within this period)

### **Project Context:**

We are seeking a motivated postdoctoral researcher to join a project funded by the ANR Tremplin-ERC program. The project aims to understand how liquids control deformation localization in the sub-arc mantle of subduction zones. This postdoctoral position focuses on developing innovative numerical modeling, integrating machine learning (ML) and reduced-order models to bridge micro- to macro-scales.

### **Key Responsibilities:**

- **Develop and train ML models** to predict phase proportions and magma content based on thermodynamic calculations
- Integrate ML models into reactive **two-phase flow simulations**
- Generate plausible dataset of models for **reduced-order modeling**
- **Calibrate model results using natural analogs**, particularly field data from exhumed subduction zone systems.

### **Supervision and Collaboration**

The postdoctoral researcher will work under the supervision of Nestor Cerpa and collaborate with experts in geodynamics, petrology, and computational modeling, including Andrea Tommasi and Romain Tilhac at Geosciences Montpellier. The project offers opportunities for collaboration with national and international partners (e.g. Dave May, UCSD).

### **Required Qualifications:**

- PhD in geophysics, geodynamics, computational geosciences, or a related field.
- Strong background in numerical modeling, ideally with experience in ML applications
- Proficiency in scientific programming (e.g., Python, C++, or similar).
- Experience with high-performance computing (HPC) environments is a plus.
- Ability to work independently and as part of a team, with excellent communication skills.

### **Working Environment:**

The position is based at CNRS in Montpellier, France, within a dynamic research group focused on geodynamics and computational modeling. The successful candidate will have access to HPC resources and opportunities for collaboration with national and international partners.

### **Application:**

Interested candidates should submit a CV, a cover letter detailing research interests and relevant experience, and contact information for two references. Applications will be reviewed on a rolling basis until the position is filled.

### **Contact:**

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