

Post-doctoral Position 12 months
Project “Gravity currents over a sediment bed”

Characteristics of the position:

Functions/ features	Post-doctoral position on the project entitled “Data analysis from physical experiments on gravity currents over a sediment bed”
Employment type	BAP E – E1E45
Category	A
Body	Young researcher post-doctoral position
Quotas	100%

Assignment:

Laboratoire des Ecoulements Géophysiques et Industriels (LEGI)
1209-1211 rue de la Piscine
38400 Saint-Martin-d’Hères
France

Context and work environment

Gravity currents are key processes that affect atmospheric, ocean and coastal circulation. Most of the gravity currents in nature occur over complex terrain, i.e. rough or mobile terrain with bottom sediments/particles. Few studies have addressed simultaneously the feedback between the hydrodynamics of a gravity current and the geomorphological changes of a mobile bed. Hydrodynamic quantities such as turbulent and mean velocities, bed shear stress and turbulent stresses undoubtedly govern the processes of entrainment, transport and deposition. On the other hand, the incorporation of entrained sediment in the current may change its momentum by introducing extra internal stresses, provoking thus a feedback process. These two main questions are the object of investigation in this project. The results of this study will deliver important new insights concerning the interaction between the gravity current dynamics and the bottom sediments, still little studied, which is of large interest in the geophysical fluid mechanics community. It will have an impact on problems related to sediment/pollutants transport, bottom erosion, and dynamic of powder snow avalanches.

Structure description:

The **Laboratoire des Ecoulements Géophysiques et Industriels (LEGI)** is a Joint Research Unit (UMR 5519) of the Centre National de la Recherche Scientifique (CNRS), the Institut National Polytechnique de Grenoble (Grenoble INP) and the University Grenoble-Alpes (UGA). LEGI carries out a wide range of research activities with a common ground: fluid mechanics and related transport phenomena.

Team description:

The candidate will be under the authority of Maria Eletta NEGRETTI (Researcher at LEGI).

The team is composed of 3 agents:

Maria Eletta Negretti (Researcher at LEGI)

Florence Naaim (Researcher at INRAE)

Position's mission and main activities

Mission: The project relies on an existing, high quality laboratory dataset on both continuously supplied (LEGI) and finite volume released (INRAE) downslope gravity currents, that have to be exploited by the candidate.

Main activities:

- Image pre-post processing, data analysis
- Discussion of the results, physical interpretation of the results
- Writing journal articles
- One seminar to be held in LEGI.

Desired profile

Expected skills (priority) :

The candidate will need to master advanced data analysis tools, with a basic knowledge on Particle Image Velocimetry (PIV), Laser Induced Fluorescence (LIF), and image pre- and post-processing.

- **Trade skills/ expertise**

A solid background in fluid mechanics and sediment transport is a prerequisite.

- **Personal skills**

Curiosity, autonomy and willingness to develop new skills are necessary.

Supervisory mission: Yes No

Desired professional experience : beginner 2 to 5 years

Previous formation, diplomas:

The candidate must have a PhD in physics or mechanics or mathematics/statistics.

General information

The gross salary is 2750 euros/month, equivalent to a net salary of 2210 euros/month.

Applicants should send their CV and covering letter by e-mail to the following person:

Contact for the questions related to the position:

Maria Eletta NEGRETTI, CNRS Researcher

Mail : eletta.negretti@legi.cnrs.fr