



## PhD student

Grain size trends in mountainous streams and the construction of stratigraphies and gravel resources: A source-to-sink perspective.

The Institute of Geological Sciences at the University of Bern invites applications for a fully-funded 3-year PhD project in the framework of the Marie Curie Innovative Training Network (ITN) 'Source-to-Sink Future', which also includes several university and industry partners in Europe.

### Research objectives

What is the natural variability in grain sizes in coarse-grained mountainous streams as the flow pattern changes from braided to meandering in particular, or from the source area to a sedimentary sink in general? How do anthropogenic perturbations such as the construction of check dams and artificial channels together with water management practices influence a natural pattern of downstream grain size changes? What are the consequences of these on the sediment transport mechanisms and the related time scales? We propose to tackle these questions within the framework the Marie Curie ITN 'source-to-sink future'. The overall scope is to explore the human's impact on the morphology of streams and sediment transport with a focus on mountain steams.

The PhD student will be expected to measure, from the headwaters down to the valley bottom along selected streams in the European Alps and possibly also in Colombia: channel widths, energy gradients, flow patterns and grain sizes during field campaigns. For selected sites, the PhD student will repeatedly measure these variables several times a year to detect possible temporal variations of these variables. The PhD student will combine these results and estimate patterns of bedload and suspension load in mountainous streams in Europe where nearly all rivers have been corrected, and possibly also in Colombia where streams are still in their natural state. Sediment transport, sediment flux and grain size distributions for natural and anthropogenically corrected streams will be modeled using the Bagnold equation for bedload transport.

### Requirements

- The candidate should not have a doctoral degree and fulfil the eligibility criteria and mobility rule (see below)
- The candidate should hold or be about to obtain a Master's degree in Earth Science or relevant field.
- Excellent technical skills including field experience in sedimentology, geological mapping, and possibly in matlab/Python/R analysis, statistics.
- Previous experience working with clastic sediments, including stratigraphy and grain size assessment will be an advantage.
- The ability to work both as part of a team, and independently, coupled with excellent communication, organizational and problem-solving skills
- Availability to travel for training events and meetings/collaborations with ITN partners.

### Eligibility criteria

Recruiting is in accordance with the European rules for Marie Curie Initial Training Networks. Early-stage researchers (ESR) can be of any nationality. They must be, at the time of recruitment by the host organization, in the first four years (full-time equivalent) of their research careers and have not yet been awarded a doctoral degree. The research career starts after the degree that enables a student to proceed with a PhD (usually, the Master degree).

### Mobility rule

At the time of the recruitment by the first host institution, the ESRs must not have resided or carried out their main activity (work, studies, etc.) in the country of their first host institution for more than 12 months in the 3 years immediately before the recruitment date. Short stays such as holidays and/or compulsory national service are not taken into account.

### Training

The project is embedded in the Marie Curie Innovative Training Network 'Source-to-Sink Future'. The successful candidate will benefit from being involved in scientific/soft-skills meetings and in research activities conducted in other laboratories/companies from Europe and associated countries. An important component of the training will be the participation to 3 main major "Summer Institutes".

Start of project: Between Mai 1st and August 1st

### How to apply

Send your complete application before 1st of March to **both contacts** below (application will remain open until position is filled).

A **single pdf file** needs to be submitted including:

- a cover letter, stating your research motivation and interests; including relevant background and career plan (max 1 A4 page)
- a Curriculum Vitae, including academic background, previous research and/or industrial experience (max 2 A4 pages)
- Degree transcripts (with marks)
- English language qualification certificates (or equivalent)

### Reference letters:

at least 2 confidential reference letters from academics (including name, position and email address of the referee) (max 1 A4 page, with substantiated assessment of the applicant's technical skills, creativity, innovation ability, working capacity, efficiency and level of independence) must be sent directly to the contacts below.

### Contacts:

PhD Supervisor: [fritz.schlunegger@geo.unibe.ch](mailto:fritz.schlunegger@geo.unibe.ch)

Recruitment Board: [François.Guillocheau@univ-rennes1.fr](mailto:François.Guillocheau@univ-rennes1.fr)

Project website: <https://cordis.europa.eu/project/rcn/224709/factsheet/en>

Research group website: [https://www.geo.unibe.ch/research/exogene\\_geology/research/index\\_eng.html](https://www.geo.unibe.ch/research/exogene_geology/research/index_eng.html)

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