

2 funded PhD positions in Geotechnical Engineering, UPC, Barcelona

There are two PhD positions available in the Department of Civil and Environmental Engineering, UPC BarcelonaTECH, in the Division of Geotechnical Engineering and Geosciences (pdf file available [here](#)).

The successful candidates will work within the framework of the multidisciplinary research project EROSLOP "Multiscale analysis of soil erosion in steep slopes" (<https://eroslop.upc.edu>) EROSLOP is an ambitious project gathering teams from different disciplines. It involves the study and modelling of erosion processes under climatic actions at different scales and in different materials and environments: granular materials (in till debris flow catchments), silty compacted materials (for man-made embankments) and degraded hard clays (in "bad lands" slope reliefs). Research includes laboratory works, field surveys, recognition campaigns, sites monitoring and modelling works. The pursued objective is the integration of the processes and factors identified at the different scales within a comprehensive multiscale analysis tool.

The announced PhD positions belong to the Workpackages devoted to the geotechnical tasks although there will be permanent interactions with others Workpackages and the entire research group. Two topics, one experimental and the other on modelling aspects, are open for candidatures:

PhD1: Erosion in degraded hard clay materials. The student will be involved in:

- 1) laboratory testing of hard clays degradation under thaw/freeze cycles;
- 2) small scale indoor physical modelling of erosion of degraded hard clays under artificial rain;
- 3) field monitoring of hard clays degradation and erosion in a "bad lands" slope.

PhD2: Numerical modelling of erosion processes at slope and catchment scale. Research will involve developments in home-made existing numerical tools (FE, MPM, in FORTRAN) and their applications to the modelling of project sites. Objectives of the developments are:

- 1) to model material degradation and erosion at slope scale;

- 2) to implement model reduction techniques and adapt the codes to High Performance Computing (HPC) format in view of the modelling at catchment scale.

We are looking to students with high motivation and creative imagination. PhD1 is more directed to students holding a degree in Civil or Geological Engineering. PhD2 is open to students graduate in Civil Engineering, Applied Mathematics or relevant fields with strong theoretical bases in Mathematics, Continuum Mechanics and Numerical Modelling. Although not mandatory, skills in constitutive modelling, numerical techniques and HPC would be acknowledged as an added value.

The students will join a stimulating and international group with world recognized research. The gross annual salary is 16,246 € for the first 2 years, 17,406 € in the third year and 21,758 € for the fourth year (if applicable). No PhD tuition fees will be charged. Position is expected to start as soon as possible.

Contact info:

Interested candidates are encouraged to send their CV accompanied with a motivation letter and contact details of two referees to Jean Vaunat (jean.vaunat@upc.edu) before January 15th (included).