

SPIN

MONITORING A
RESTLESS EARTH

SPIN ESR 1.4: Ocean floor seismological and environmental monitoring

Host institution: Institut de Physique du Globe de Paris (IPGP)

Supervisors:

main supervisor: E. Stutzmann (IPGP, F)

co-supervisors: W. Crawford, J-P. Montagner (IPGP, F)

Application deadline: August 1st, 2021, position remains open until filled

Earliest possible starting date: September 1st, 2021



General information

This PhD position is one of the 15 Early Stage Researcher (ESR) positions within the SPIN project (<http://spin-itn.eu>). SPIN is an Innovative Training Network (ITN) funded by the European Commission under the Horizon 2020 Marie Skłodowska-Curie Action (MSCA).

SPIN will focus on training 15 PhD candidates in emerging measurement technologies in seismology. We will research the design of monitoring systems for precursory changes in material properties, all while optimizing observation strategies. The unique interdisciplinary and inter-sectoral network will enable PhDs to gain international expertise at excellent research institutions, with a meaningful exposure of each PhD to other disciplines and sectors, thus going far beyond the education at a single PhD programme. For further information on the project, please consult our website at: <http://spin-itn.eu>.

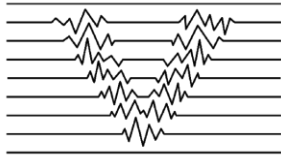
Project description

Oceans cover the 2/3 of the Earth and ocean bottom seismometer stations (OBS) are key instruments for monitoring the Earth's activity. These stations are sensitive to earthquakes, but also to "noise" from ocean waves and currents, storms, hurricanes, landslides, marine fauna, human activities and cryospheric events. They provide fundamental information on tectonic earthquakes, geological processes and the local structure beneath the station, while the noise can be used to monitor environmental parameters and changes in structure beneath the station. First order noise sources are compliance, the ground response to infra-gravity waves passing above the stations, and tilt caused by ocean currents passing by the stations. The purpose of this PhD is to enhance our ability to extract environmental and seismological data from OBS records, by separating the noise into its component elements. The PhD student will first develop innovative tools to analyze and separate the tilt and compliance signals from the OBS data. The approach will combine signal processing, physical understanding and machine learning algorithms. The student will then use the "clean" signals for various applications in environmental, tectonic and structural seismology. Several OBS datasets have been acquired over the last years and the PhD student will focus on the RHUM-RUM experiment data, in which 50 OBSs were deployed for one year in the Indian Ocean around La Reunion island. To complement this dataset, the PhD student will also use data from new DAS (distributed acoustic sensor) sensors which can measure signals nearly continuously along an optical cable.



Funded by the European Union's Horizon 2020 research and innovation programme
under the Marie Skłodowska-Curie grant agreement No. 955515.





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Required skills and experience

We welcome applications from candidates who fulfil the following criteria:

- A completed research-oriented university degree, such as a Master's degree or BSc Hons, in a relevant field (e.g. Geophysics, Physics, Applied Mathematics, or similar fields) The PhD enrolment requirements will depend on the hosting institute, please refer to the individual project descriptions and institute webpages.
- An outstanding academic track record
- An good command of English, both verbal and written
- Dedication and enthusiasm for research, combined with scientific curiosity, reliability and the capacity to teamwork in an interdisciplinary environment.
- Skills in signal processing, basic physics, seismology and programming are required.

Please ensure that you fulfil the following **eligibility criteria** for ESR (Early Stage Researcher) positions in H2020 MSCA-ITNs, as ineligible candidates cannot be considered:

<https://spin-itn.eu/recruitment/#eligibility-criteria>

Application Procedure

The **application deadline is August 1st, 2021**. Application evaluations will start immediately, and will continue until all positions are filled. We wish to reflect the diversity of society and we welcome applications from all qualified candidates regardless of personal background. The selection will be exclusively based on qualification without regard to gender identity, sexual orientation religion, national origin or age.

Applications must include:

- A cover letter in which you describe your motivation and qualifications for the position.
- A CV including relevant competences, skills and publication list, if applicable
- Copies of degree certificate(s) and transcripts of records for previous studies (Bachelor and/or Master). Please indicate expected date of graduation if your Master's degree is not completed
- Contact information of two references
- Completion of the SPIN application form: <http://uhh.de/min-spin-apply>

Applications should be sent in **one single pdf file** with filename `SPIN_YourLastname_YourFirstname.pdf` to spin-applications.min@uni-hamburg.de with copy to: Eléonore Stutzmann (Stutz@ipgp.fr), Wayne Crawford (Crawford@ipgp.fr) and Jean-Paul Montagner (jpm@ipgp.fr)

Data handling

By applying to a PhD position, you agree that all data concerning your application may be stored electronically and distributed among the supervisors involved in the selection procedure within the MSCA ITN SPIN. If you do not agree, your application can not be processed further, due to the project's centralised recruitment process. The data are used solely for the recruitment process and we do not share information about you with any third party.



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