

# SPIN

MONITORING A  
RESTLESS EARTH

## SPIN ESR 3.3: Detection and characterization of seismic signals with dense arrays of new seismological instruments

**Host institution:** ISTERre, University of Grenoble, FRANCE



**Supervisors:**

main supervisor: Piero Poli, ISTERRE

co-supervisor: Cedric Schmelzbach, ETH, Zurich

**Application deadline** 1/08/2021. Position remains open until filled.

**Earliest possible starting date** September 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>.

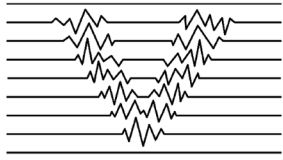
### Project description

With the advent of large and heterogeneous datasets (e.g. DAS, dense arrays of nodes) it is possible to discover new, 'hidden' signals, besides earthquakes, which can directly inform us about the spatiotemporal evolution of elastic properties on a fault (e.g. processes occurring during earthquake nucleation, volcanic eruptions etc). In this project we will develop and apply coherence-based methods for new instruments and heterogeneous datasets, exploiting the different sensitivities of different sensors. This combination of technique and new data will be used to detect tiny and exotic signals (e.g. tremor-like, emergent) often escaping routine analysis. The coherence features will be used to obtain a global view of the wavefield, for a rapid identification of anomalous signals, and classification of large seismic datasets through clustering algorithms. During this project, different datasets will be explored, including DAS and dense array of nodes installed in volcanic areas, close to major seismogenic faults, and/or in glaciers. The project will require mobility in between the main host institute (ISTERre, Grenoble) and ETH, Zurich.



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 fulfill 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, ..) The PhD enrollment 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.
- Good knowledge of programming in python and possible knowledge of high-performing computing using GPUs.

Please ensure that you fulfill 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 1/08/2021. 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](mailto:spin-applications.min@uni-hamburg.de)

## 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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