

SPIN

MONITORING A
RESTLESS EARTH

SPIN ESR 1.2: Distributed Acoustic Sensing for Natural Hazard Assessment

Host institution:

ETH Zürich, Seismology & Wave Physics Group (www.swp.ethz.ch)

ETH zürich

Supervisors:

main supervisor: Prof. Andreas Fichtner

co-supervisor: Dr. Cédric Schmelzbach

Application deadline:

1 April 2021

Earliest possible starting date:

1 May 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 optimising 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 in a single PhD programme. For further information on the project, please consult our website at: <http://spin-itn.eu>.

Project description

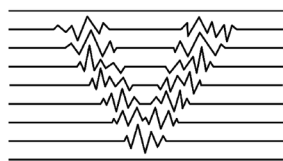
Recent, pioneering studies have shown the possibilities of using distributed fibre-optic sensing (DAS) for seismic observations. DAS has enormous potential in natural hazard applications, where very dense seismic instrumentation is needed but impossible to achieve with conventional sensors. This includes the monitoring of glaciers, potentially unstable slopes, and earthquake-induced ground motion in densely populated urban areas.

While experience on the observational and experimental aspects of DAS is quickly accumulating, our capability to analyse DAS data such that their rich information can be fully exploited, remains under-developed. Within this context, this project aims to properly quantify observational uncertainties of DAS waveforms and to integrate them into the design of suitable misfit functionals. This is intended to lead towards DAS-based full waveform inversion methods and applications for both earthquake source properties and 3D Earth structure.



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 quantitative natural science, e.g., geophysics, physics, mathematics, The PhD enrollment requirements will depend on the host institution. Please refer to the individual project descriptions and institute webpages.
- An outstanding academic track record.
- A 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.
- Programming skills, preferably in Python or C/C++.
- Basic knowledge of signal processing.

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 April 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

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 cannot 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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