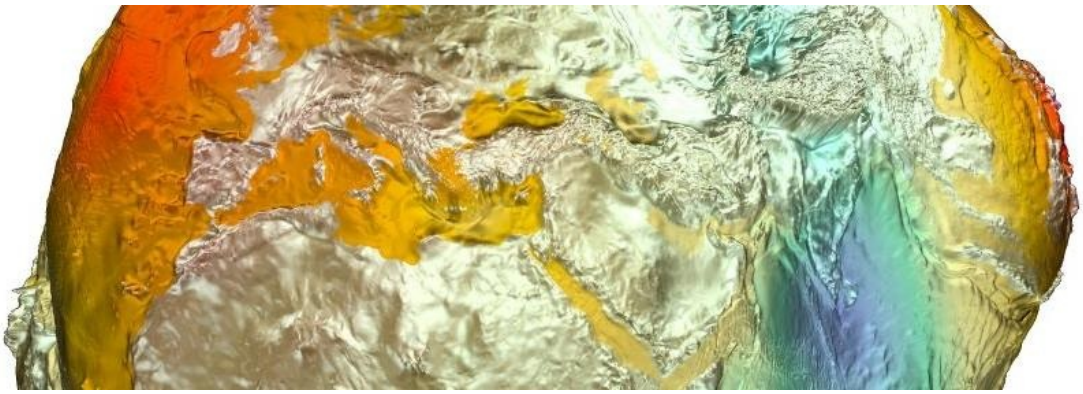
PhD student (f_m_x) – Fibre-Optics for high-resolution Imaging in Urban Areas



GFZ is Germany's national centre for solid Earth research. We advance the understanding of dynamic processes to address global challenges, from mitigating the impacts of natural hazards and sustaining our habitat amid global change to responsibly managing georesources. We are part of the Helmholtz Association, the largest German scientific organisation. With around 1,200 employees as well as ca. 500 guest researchers, we contribute to the Helmholtz Research Field Earth and Environment, aligning cutting-edge research with societal relevance and international collaboration. Our work integrates multidisciplinary studies across Earth's system components, leveraging advanced technologies and infrastructure to research solutions and to transfer our knowledge to society. We are doing this according to our vision: “Taking the pulse of our Earth to safeguard a habitable planet”.

For section 2.2 Geophysical Imaging (https://www.gfz.de/en/section/geophysical-imaging/overview) (department “Geophysics” (https://www.gfz.de/en/geophysics)), we are looking for a:

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Reference Number 10496

Urban sustainable development and improved resilience to geohazards require an exhaustive understanding of the shallow subsurface at the sub-kilometre scale. Yet, high-resolution imaging of the urban subsurface is challenging using classical geophysical approaches.

In the frame of the Helmholtz-funded project InDySE (https://www.gfz.de/en/section/geophysical-imaging/projects/indyse) (Interrogating the Dynamic Shallow Earth), this PhD project focuses on combining Distributed Acoustic Sensing (DAS) deployed on existing fibre-optic networks (dark fibres) with interferometric analysis of ambient seismic noise for efficient, high-resolution imaging of the near-surface in densely populated areas. The successful candidate will analyse existing and newly acquired DAS data from urban areas to create velocity models of the subsurface to identify and characterise structures such as faults, obtain information about material properties, and derive parameters useful for improved hazard assessment. Integration of DAS data with conventional seismic sensors and the combination of ambient noise and earthquake signals may also be explored. One of the main study areas will be the city of Istanbul (Turkey). Together with investigations of temporal variations in seismic properties, this work will contribute to improved generation of comprehensive models of the urban shallow subsurface, with implications for geohazard assessment and mitigation.

Your responsibilities:

- Development and application of ambient seismic noise interferometry approaches to DAS field data for subsurface imaging
- Compilation of existing subsurface and auxiliary data and integration/interpretation of the results
- Contribution to the design, planning and execution of DAS field experiments
- Publish results in peer-reviewed journals and present at meetings and international conferences

Your qualifications:

- A Master's degree (or equivalent) in Geophysics (preferred), Physics, Computer Science or in a related discipline
- Background in Seismology; experience in the field of seismic noise preferred but not required

- Familiarity and prior experience working with DAS data are advantageous but not required
- Strong computational and scientific programming skills (Python, Matlab, C, C++, etc.)
- Good communication skills and a good command of written and spoken English
- Willingness to participate in field experiments

What we offer:

- Ambitious and varied tasks in a dynamic and international research environment
- State-of-the-art equipment
- Public service benefits
- Extensive training opportunities
- Professional career advice offered by our in-house Career-Centre
- Flexible working hours and conditions
- Support with finding a good work-life balance offered by benefit@work
- Institute day-care centre on site
- Working at the Albert Einstein science park on the Telegrafenberg in Potsdam
- Work place within walking distance of Potsdam main train station, or just a short ride on the shuttle bus

Start date: 1st September 2025
Fixed-term: 3 years
Salary: The position is classed as salary group 13 according to “TVöD Bund (Tarifgebiet Ost)”. The salary group is determined on the basis of the Collective Wage Agreement and the respective personal qualifications.
Working hours: Part-time 75% (currently 29.25 h/week)
Place of work: Potsdam

Have we piqued your interest?

If so, we look forward to receiving your application by **30th June 2025**.
Required documents: CV and letter of motivation
Desirable documents: certificates/grades
Please use our online application form only.

The GFZ actively promotes diversity and explicitly welcomes applications from all qualified individuals, regardless of ethnic and social origin, nationality, gender, sexual orientation and identity, religion/belief, age and physical characteristics. We also promote an inclusive working environment in which everyone can fully develop their own talents. Anyone who has been recognised as severely disabled, will be given preferential consideration in the event of equal suitability and qualification in accordance with the provisions of the German Social Code IX. In case of further queries regarding gender equality, please do not hesitate to contact our Equal Opportunities Officer (https://www.gfz.de/en/career/the-gfz-as-an-employer/employee-representation).

“Diversity in perspectives” is one of GFZ's core values. As an integral part of supporting diversity at our centre, we actively promote women in science and in leadership positions. We among others do this through our gender equality plan and the cascade model (https://www.gfz.de/en/career/the-gfz-as-an-employer/equal-opportunities) measures which we actively implement to enable sustainable equal opportunities in academic career paths. The GFZ thus committedly strives for gender equality in science, including in leadership positions, and strongly encourages women to apply.

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Your personal data will be processed for the purpose of conducting the selection procedure on the basis of Art. 6 para. 1 b, Art. 88 GDPR in conjunction with Art. 26 of the Data Protection Act for the State of Brandenburg. After completion of the procedure, application documents will be deleted in compliance with data protection regulations.

In case of any further queries relating to the field of activity, please contact Dr. Verónica Rodríguez Tribaldos (mailto:veronica.rodriguez.tribaldos@gfz.de) either via email or phone +49 (0)331-6264-1279. If you have any general questions about the application process, please contact our recruiting team at our phone number +49 (0) 331-6264-28787.