

Job category

Adjunct professor

Hiring Institution

Instituto Politécnico de Lisboa - Instituto Superior de Engenharia de Lisboa

Additional host institution

Universidade de Lisboa (UL) - Faculdade de Ciências da Universidade de Lisboa - Instituto Dom Luiz

Call's publication date

October to December 2024

Scientific domain

Natural Sciences

Scientific area

Earth and Related Environmental Sciences

Scientific sub-area

Geophysics

Field(s) description

Adjunct Professor in Physics-Geophysics, IDL chair in Seismology and Wave Physics

Position's alignment with SDGs of the United Nations 2030 Agenda

SDG Goal 11: Sustainable Cities and Communities

SDG Goal 4: Quality Education

SDG Goal 8: Decent Work and Economic Growth

Research unit/Associate laboratory chair**Name of the Host Research Unit/Associate Laboratory**

Universidade de Lisboa (UL) - Faculdade de Ciências da Universidade de Lisboa - Instituto Dom Luiz

Commitment Declaration[IDL-FCUL-ISEL-1-Seismology and Wave Physics PT_signed.pdf](#)

Obtained on 29-02-2024 at 14:01:56

Does it involve co-funding?

33%

Job description, scientific profile and rationale

We propose hiring an Adjunct Professor in Physics/Geophysics with Seismology and Wave Physics expertise. He/she will be integrated as a professor in the Physics Department (DF) (<https://www.isel.pt/departamento/fisica>) of ISEL and as a researcher at IDL as part of the Research Group Solid Earth Dynamics (<https://idl.ciencias.ulisboa.pt>). The successful candidate is expected to collaborate with the overall strategy of investigating the solid Earth's physical structure and dynamics and associated phenomena by strengthening knowledge of new seismic data acquisition and processing algorithms required by the big data associated with the latest technological developments. He/she is expected to develop new methodologies for inversion and modelling, allowing to obtain fast multi-scale high-resolution imaging of the shallow Earth's structure using large seismic data sets, which will contribute to the exploration and exploitation of natural resources and monitoring, assisting the most recent societal and industry demands for preserving a sustainable environment. He/she is expected to be able to undertake innovative, independent, and collaborative research and make proof of having the necessary initiative to promote professional and community links and explore the scope for interdisciplinary collaboration within and beyond academia taking advantage of the ISEL engineering opportunities. He/she is expected to secure competitive national and international projects and attract graduated students and young researchers. Therefore, the new employee should play an active role in career planning for early-career scientific staff and take responsibility for educating undergraduate and graduate students and postdoctoral researchers in collaboration with IDL. This will result in high-quality outputs, including publications in peer-reviewed scientific literature, and communications at leading national and international

conferences and seminars that will contribute to the scientific achievements of both DF/ISEL and IDL. As part of his lecturing duties, he/she should be able to provide high-quality and engaging teaching across the portfolio of courses offered by the DF/ISEL. An ability and willingness to be involved in lab-based education and establish industry partnerships would also be desirable.

We require a candidate with a Geophysics/Physics background, a PhD in Geophysics/Physics, and postdoctoral experience. We are particularly interested in applicants with a strong seismology and wave physics background, able to model the Earth's subsurface physical parameters and related phenomena, demonstrated by a strong publication track record in international peer-reviewed indexed journals with high impact in this research field. We also seek a candidate with expertise in acquiring, processing, and interpreting massive amounts of seismic data and have the necessary skills to develop and use High-Performance Computing tools to implement well-established seismic techniques, including, but not limited to, seismic tomography, anisotropy, or waveform inversions. Experience leading research projects and supervising MSc and PhD students will also be valued.

The Geophysics group has been established at DF/ISEL for over 25 years. The group has a strong physics background, with most of its members studying the solid Earth. The DF/ISEL is currently seeking to expand its research activities, also in connection with our new 1st-cycle degree program in Applied Physical Engineering (LEFA), which has the potential to attract students interested in pursuing academic research. We also aim to strengthen our ties with the IDL, which includes a research group in Solid Earth Dynamics, already involving six staff members of DF. The new generation of scientific equipment, new tools, and existing new data to continuously monitor the Earth's seismic vibrations are key advancements to improve the resolution of images of the Earth significantly. Another critical innovation comes with the permanent Earth's background seismic vibrations, which repeatedly sample the shallow Earth. This is particularly relevant for short-term monitoring, where often short-term deployments are not long enough for natural sources to occur. In seismology, the volumes of data being acquired from individual experiments are now reaching hundreds of terabytes in passive seismology and petabytes in exploration seismology. Handling those large amounts of data is challenging and requires a solid geophysics background and good computational skills. The new hire would: (i) bring new skills, thereby enhancing our (ISEL and IDL) ability to tackle a broader range of problems and thus boost our research output; (ii) help consolidate physics of the earth studies and computational methods, which at present relies largely on temporary staff; (iii) help to recruit junior researchers and attract competitive funding.

Benefits and resources offered to the selected candidate

At ISEL, the successful candidate will have access to the DF Seismology Laboratory – LANAS, equipped with computer facilities and 8 portable short-period seismic stations, that will complement the existing IDL facilities. He/she will benefit from a solid collaboration with other engineering departments committed to development and innovation activities and projects aiming to provide better services to the community, allowing to development of research outside academia. To ease the candidate's teaching duties, he/she will benefit from a well-organized inter-departmental sharing of teaching and learning resources. All ISEL staff are assessed for research, teaching, service and personal development performance every three years. The outcome of this assessment may have an impact on remuneration. At IDL, he/she will benefit from a multidisciplinary scientific environment. IDL has been able to secure the top mark of Excellent in periodic evaluations by FCT, as well as the status of Associate Laboratory, attributed to only a few research units considered strategic by FCT. IDL promotes multi-disciplinary research in Earth Sciences, aiming at a holistic understanding of the Earth Systems dynamics, which allows to inform strategies to tackle important societal challenges, such as the Energy Transition, Natural Hazards, and Climate Change. IDL offers a range of facilities to its researchers, namely access to High-Performance Computing resources and various laboratories, namely the Seismology lab, the Applied Geophysics lab, the Geomagnetism lab, and the Fluid Mechanics lab. In addition, IDL supports various activities at the post-graduate level, having hosted two doctoral programs and maintaining a very successful yearly Earth Systems Summer School. IDL provides strong support to the management of scientific proposals and funds. A lump sum for research activities is attributed to DF/ISEL IDL members individually, under the terms of the IDL-ISEL partnership and management

Context, expected impact, and relevance of the scientific profile

The new position would help to rejuvenate and re-energise DF/ISEL, increasing our competitiveness and, therefore, our ability to attract both funding and new talent, which are key to achieving ISEL's overall goals of becoming a more international and more inclusive forum for high-quality research and education in science and technology.

Over the last years, as an engineering school, ISEL has been increasing its research capabilities in its several areas, in particular those related to the societal impact of natural hazards or associated with Europe's re-industrialization efforts. Some of those impacts on infrastructures, namely those connected to civil or mechanical engineering are related to seismology, either due to seismic or tsunami hazards, requiring a specific background to be addressed. IDL's core endeavour is to carry out excellent research in Earth Science, and to fully explore its impact on achieving viable solutions to some of human society's near future most dire challenges, namely: climate change, (resulting and unrelated) natural hazards, and the demand for a progressive change of paradigm on energy dependency (from fossil to renewable sources). Therefore, IDL faces a permanent demand to maintain and further develop scientific excellence in all Earth-Science research domains, particularly in Seismology and Wave Physics whose knowledge is of critical importance for the aforementioned research priorities.

Thanks to his/her knowledge, skills and acquaintances, the new staff hire would be an invaluable contribution to attain the following objectives: (i) consolidate its high-impact research activity; (ii) foster a student-centred intellectually stimulating environment for advanced training; and (iii) explore further collaborations with industry to promote knowledge transfer. This would also strengthen the ties between IDL and ISEL, established within the IDL-ISEL partnership and management agreement (<https://www.isel.pt/ecossistema-de-inovacao/unidades-de-ied/estruturas-e-unidades>): at present, 6 staff members of the ISEL Physics Department are also members of IDL, 3 of whom work on Seismology