



# ÉCOLE DOCTORALE

SCIENCES DE LA TERRE ET DE L'ENVIRONNEMENT  
ET PHYSIQUE DE L'UNIVERS, PARIS

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**Subject title: Ocean floor seismological and environmental monitoring**

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Host lab/ Team : *please fill in and leave out meaningless information*

**IPGP- Seismology – UMR7154**

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**Presentation of the subject:** (Maximum 2 pages)

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.

Skills in signal processing, basic physics, seismology and programming are required.

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Applicants should submit a cover letter including a statement of interest, a curriculum vitae, the name and address of two persons of reference via email to:  
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