



Subject offered for a contract starting October 2017

**SUBJECT TITLE:** Reconstruction of Seawater Carbonate chemistry during the last Glacial-Interglacial transition from Boron isotopic ratios and concentrations in foraminifera

Advisor: **Rollion-Bard Claire, IR, [rollion@ipgp.fr](mailto:rollion@ipgp.fr)**

Host lab/ Team :

**IPGP- Team G2E – UMR7154**

Financing: Doctoral contract with or without teaching assignment

*For more information go to <http://ed560.ipgp.fr>, section: Offres de these (PhD offer), You must apply on the Doctoral School website*

Anthropogenic activities are releasing CO<sub>2</sub> ten times faster than at any time in the last 65 million years, and possibly the last 300 Myr, making the management of the anthropogenic carbon perturbation one of societies' major challenges. To accurately project the consequences of anthropogenic perturbations on the carbon cycle, it is vital to first understand the fluctuations and variability of the natural sinks and sources of the Earth's carbon cycle. This requires accurate reconstruction of the oceanic carbonate chemistry because changes in the carbon storage in the deep ocean are the key to explain the glacial/interglacial atmospheric CO<sub>2</sub> variations observed in ice core records.

This PhD project proposes to use the boron isotope composition ( $\delta^{11}\text{B}$ ), an oceanic pH-proxy and B/Ca, a proxy of oceanic bicarbonate ion concentration of planktonic and benthic foraminiferal calcite as master variables to reconstruct changes in surface to deep ocean carbon gradient and to identify and to quantify the natural carbon storage in the glacial ocean and its degassing during the deglaciation. An important part of the project will be also to develop analytical methods required to produce a robust reconstruction of the surface to deep ocean carbon gradient using small sample sizes and assess individual variability.

This project will be performed in collaboration with Pascale Louvat (IPGP).

This PhD thesis of 3 years is part of the ANR project B2SeaCarb (French-German collaboration). The project will be embedded into the research group of Geochemistry of External Layers, as part of the "Institut de Physique du Globe de Paris" (IPGP-<http://www.ipgp.fr/en/gee/external-envelopes-geochemistry>), France. The department hosts numerous analytical facilities, including (laser)-MC-ICP-MS, and ultra-clean laboratories (Plateforme PARI - <http://www.ipgp.fr/fr/plateforme-pari>).

#### Qualifications:

As a successful candidate you should have

- ☐ A MSc degree in a relevant field such as isotopic geochemistry, environmental proxy, carbonate geochemistry, paleoclimatology
- ☐ A broad interest in geosciences, and the willingness and capacity to work independently
- ☐ The ability to work in an internationally oriented environment



☐ Interest to climatology and knowledge of mass spectrometry technique are very welcomed

Methods:

- chemistry in ultra-clean lab
- control of the blanks
- analytical development for measurement of small size samples
- MC-ICP-MS technique

Please submit your complete application (including a CV [max. 3 pages], a letter of motivation for the position and a statement of your research interests [max. 1 page], plus contact details of at least two referees) to Claire Rollion-Bard (rollion@ipgp.fr). Applications are accepted until **June 15th 2017**. Contract will preferentially start on October 1st, 2017.