Marie Skłodowska-Curie actions
Innovative Training Network (ITN-ETN)
”BASE-LiNE Earth”

Brachiopods As SEnsitive tracers of gLobal mariNe Environment: Insights from alkaline, alkaline Earth metal, and metalloid trace element ratios and isotope systems

We invite applications to undertake competitive high-level research on the complex Phanerozoic seawater history through the determination of original proxy information preserved in reliable ancient geological archives like fossil brachiopods using cutting edge technologies and experimental approaches within the Marie Skłodowska-Curie Initial Training Networks (ITN-ETN) »Brachiopods As SEnsitive tracers of gLobal mariNe Environment: Insights from alkaline, alkaline Earth metal, and metalloid trace element ratios and isotope systems«. BASE-LiNE Earth is funded through the HORIZON2020 program of the European Union and consists of 14 full partners and seven associated partners out of 11 countries (Austria, Australia, Canada, Czech Republic, Denmark, France, Germany, Israel, Italy, Poland, Slovak Republic) among them internationally leading researchers in the field of geology, chemistry and isotope geochemistry, marine biology and ecology as well as numerical modelling and engineering.

The project is coordinated at the GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany. BASE-LiNE Earth will run until December 2018.

All positions offered are full-time and fixed term for 3 years. Successful applicants will benefit from training and networking program delivered jointly by academic and non-academic partners. As a result, BASE-LiNE Earth fellows will gain both, research experience and complementary skills such as career planning, communicating science, and management techniques. Researchers will mainly work in their host institution, but they will also have the possibility to visit another BASE-LiNE Earth partner for secondment activities, which could be either in academia or in industry. On completion of their fellowship, successful applicants are expected to be among the future leaders in their respective fields. The Researchers recruited for these positions are expected to be an active part within the BASE-LiNE Earth consortium by participating in network wide activities such as workshops and conferences. The candidate will be part of an international, interdisciplinary team at universities and research institutions, and is expected to attend the actions as announced in the proposal.

Equal opportunities will be respected.

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], relevant certificates, plus contact details of at least two referees) to Lucia Angiolini Dipartimento di Scienze della Terra “A. Desio” Via Mangiagalli 34 20133 Milano Italy, e-mail: lucia.angiolini@unimi.it quoting BASE-LiNE Earth ESR03. The complete applications must be received by May 31st, 2015.
**ESR03—PhD position**

*The macro-structure of modern and fossil brachiopod archives*

CONTACT: Lucia Angioli, Universita degli Studi di Milano, Italy, e-mail: lucia.angiolini@unimi.it

**SHORT DESCRIPTION:** This PhD project examines the macro- and chemico-structure of modern and fossil brachiopod shells to reconstruct evolutionary changes and fabric differentiation of the main brachiopod classes during the Phanerozoic, and to test their veracity in withstanding post-depositional alteration. This will be achieved through a combination of methods involving field collections, systematics, SEM ultrastructural analyses and geochemical trace-isotope analyses. The goal is to test the brachiopod archive’s potential for reconstructing the chemical evolution of Phanerozoic seawater.

**FULL JOB DESCRIPTION** see [https://www.baseline-earth.eu/vacancies](https://www.baseline-earth.eu/vacancies)

This PhD project focuses on the macrostructure and geochemistry of modern and fossil brachiopod shells to obtain a better understanding of the relationship between shell fabric and their reliability in storing the geochemical record of recent and deep-time seas. The project will apply a range of methodologies to a large dataset of fossil and recent brachiopods through several phases. These include: (i) selection of brachiopod shells from biostratigraphically and chronologically well constrained stratigraphic logs recording the main events in the Palaeozoic; these will be obtained from our brachiopod collection and from field work; (ii) selection of recent brachiopod shells, in part provided by other BASE-LiNE Earth project partners; (iii) Secondary Electron Microprobe and Cathodoluminescence analyses of the variation of brachiopod morphostructure; (iv) mass spectrometry analyses of the concomitant variation of carbon and oxygen isotopes, and (v) ICP-MS determination of trace and rare earth elements. Phases (i) to (iii) are aimed to describe the macrostructure, determine fabric types and their evolution and test diagenetic pathways. Phases (iv) and (v) will focus on the geochemical record of selected brachiopods. The final goal will be a synthesis of all the data reconstructing the evolution of the chemical composition of seawater over the past about 500 million years.

The project will operate in the framework of the PhD Program of the "Università degli Studi di Milano", Italy, at “Dipartimento di Scienze della Terra A. Desio”. The department is fully equipped with analytical, experimental and computational facilities, including scanning and transmission electron microscopes, powder and single-crystal X-ray diffractometers, plasma emission spectrosopes, WDS-electron microprobe, X-ray fluorescence, sedimentology, palaeontology and paleoclimatology laboratories necessary for the proposed chemostructural analyses of the project. The geochemical analyses will be performed in collaboration with Uwe Brand at Brock University, Canada, which is fully equipped to handle elemental analyses, x-ray diffraction, and wet chemical analytical techniques and preparatory labs to fully screen both modern and ancient brachiopod shell calcite.

Study and research periods at other institutions linked to the BASE-LiNE Earth project will allow for comprehensive topical expansion of the PhD study A tight collaboration amongst the BASE-LiNE Earth nodes will set an ideal basis for this and all the other related PhD projects in the frame of this study.

**Qualifications:**

As a successful candidate you should have

- A MSc degree in a relevant field such as geology, earth sciences, natural sciences, palaeontology, geochemistry
- The ability to work in an internationally-oriented environment
• A broad interest in geosciences, and the willingness and capacity to work independently
• The willingness to travel

Employment conditions:
The position is offered for three years full-time position, starting summer/autumn 2015. The ESR will be enrolled in the PhD in Earth Sciences at the University of Milan, will be contractually employed by the University and will be covered under the social security scheme. He or she will receive a Monthly Living Allowance plus a Mobility Allowance compliant with the applicable EC Marie Skłodowska-Curie Actions-ITN general conditions. (Ref: Guide for Applicants, Marie Skłodowska-Curie Actions

In order to be eligible, each applicant must simultaneously fulfil the following criteria at the time of recruitment:

• **Mobility**: At the time of recruitment, the applicant must not have resided or carried out his/her main activity (work, studies, etc...) in the country of the host organization for more than 12 months in the 3 years immediately prior to his/her recruitment. Compulsory national service and/or short stays such as holidays are not taken into account.

• **Qualifications and research experience**: The applicant must fulfil the requirements defined for Early Stage Researchers (ESRs): ESRs are researcher who, at the time of recruitment, has **NOT yet been awarded the doctorate degree** and is in the first 4 years (full-time equivalent) of his/her research career.

Additional information on *BASE-LiNE Earth* and further job descriptions can be found on our website, [www.baseline-earth.eu](http://www.baseline-earth.eu).