PhD Studentship – Fully funded (UK home fees)

An isotope-based approach to quantifying carbon burial in the Proterozoic ocean

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Project background
The burial of organic matter in the ocean is a major component of the global carbon cycle, which impacts on global climate. Recent work has indicated that the isotopic composition of the trace element cadmium may be capable of recording variations in marine organic matter burial in the past. However, the application of this novel technique to the ancient past, when seawater chemistry was very different from today, has rarely been performed.

Research methodology
This fully funded studentship is part of the UKRI Frontier Research Project ‘Disentangling the role of organic feedbacks on the global carbon cycle (DISTILL)’, which aims to use inorganic isotope geochemistry to trace Earth’s ancient organic carbon cycle. In this PhD project you will assess the ability of cadmium isotopes to trace organic carbon burial in the late Paleoproterozoic to early Neoproterozoic ocean using a suite of samples ranging from 1.8–0.8 billion years old. You will use your observations to understand the operation of the cadmium cycle in the Proterozoic, and to test important hypotheses on the history of Earth’s biosphere, as the oxygenation, and hence habitability, of the planet evolved.

Training
You will receive training in sediment sampling, the preparation of isotopic samples in ultra-clean laboratory conditions, the measurement of isotope samples using Multi-Collector Inductively Coupled Mass Spectrometry (MC-ICP-MS), as well as data processing and modelling techniques. You will also benefit from the advanced research skills training courses offered by Royal Holloway. You will be embedded in the new Royal Holloway Centre of Climate, Ocean and Atmosphere with the chance to interact and learn from researchers studying in related fields. The studentship covers home (UK) fees, 3.5 years stipend at UKRI rates, full research expenses, and associate NERC DTP membership.

Person specification
You should have a background in Earth Sciences, Geology, Physical Geography or Chemistry and be interested in isotope geochemistry and environmental change.

Applications should be made via the Royal Holloway Direct website
This should include: a cover letter stating your motivation to apply for this particular project, your C.V., academic transcript(s) and the names of two academic references. The closing date for applications is the 16th June 2023. The studentship is available to start from September 2023.

We welcome and encourage applications from women and underrepresented minorities.

For an informal discussion about the project, please contact alex.dickson@rhul.ac.uk.

Department of Earth Sciences www.rhul.ac.uk/earthsciences