

Fully-funded Studentship



Cadmium isotope signatures in marine sediments: Advancing the paleo-proxy

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Project Description:

The isotope composition of cadmium in marine sedimentary deposits may record changes in primary productivity, oxygenation, and organic carbon burial in ancient oceans. In order to accurately interpret the chemical composition of ancient sediments, however, the behaviour of cadmium during its burial into sedimentary systems needs to be understood. Diagenetic processes that occur soon after burial may lead to cadmium being redistributed between different sedimentary phases (e.g. organic matter and inorganic minerals), thus altering isotopic compositions. Diagenesis may also lead to the loss of cadmium back into the overlying ocean water, and thus impact on our understanding of the global cadmium cycle.

This 3.5 year fully funded studentship is part of the UKRI-supported ERC Consolidator 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. You will investigate how the isotopic composition and distribution of Cd in modern marine sediments changes during burial.

Training

You will be trained how to make isotopic measurements of sediments, minerals and fluids, and how to trace element distributions using Scanning Electron Microscopy, laser-ablation ICP-MS and nanoSIMS elemental mapping. Cadmium speciation will be determined using RIXS and HERFD techniques at the Grenoble synchrotron to better constrain the measured isotopic compositions. Your research will underpin efforts by the DISTILL project team to use Cd as a tracer of the organic carbon cycle. You will have the opportunity to learn from a wide network of multi-disciplinary collaborators based both within RHUL and internationally, through the DISTILL project team and as a member of the Earth Sciences Research Centre of Climate, Ocean and Atmosphere. You will also be enrolled as an associate member of the NERC ARIES Doctoral Training Programme, with the chance to participate in residential skills training courses with PhD students from several universities and research institutes across the UK.

You should have a background in the Earth and Environmental Sciences, and/or in related disciplines (chemistry, physics etc).

Applications should be made via RH Direct (<https://admissions.royalholloway.ac.uk>) and only include: Cover letter, C.V., academic transcript(s) and the names of two academic references. Additional materials will not be considered.

The **closing date** for applications is **5pm on the 28th October 2022**. Interviews are likely to be held online during w/c 8th November. The studentship is available to start from January 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.