Isotopic fractionation of cadmium during continental weathering

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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, for these signals to be accurately interpreted we must first understand how continental weathering processes control the composition of cadmium entering the oceans. This is a major challenge and requires the study of rivers and hydrothermal fluids draining a range of host lithologies from around the globe.

Research methodology
In this project you will undertake a major assessment of the cadmium isotope composition of river and hydrothermal waters from around the world. You will use these data to model the isotopic composition of cadmium entering the oceans, and to predict how changes weathering activity might alter this composition. Your findings will have a major impact on the use of cadmium isotopes as a palaeo-oceanographic tracer.

Training
You will receive advanced training in water 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 advanced data processing and modelling techniques. You will also benefit from the advanced research skills training courses offered by ARIES and 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. You will also have the chance to spend time with wider supervisory team at Oxford University.

Person specification
You should be interested in isotope geochemistry with a strong desire to understand the causes and consequences of environmental change. Enthusiasm is most important, but a background in Chemistry, Earth Sciences or Physical Geography would help as well!
**Key references**

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**Application details**

This project has been shortlisted for funding by the ARIES NERC DTP and will start on 1st October 2022. The closing date for applications is 23:59 on 12th January 2022.

Successful candidates who meet UKRI's eligibility criteria will be awarded a NERC studentship, which covers fees, stipend (£15,609 p.a. for 2021-22) and research funding.

International applicants (EU and non-EU) are be eligible for fully-funded UKRI studentships.

Please note ARIES funding does not cover visa costs (including immigration health surcharge) or other additional costs associated with relocation to the UK. ARIES students benefit from bespoke graduate training and ARIES provides £2,500 to every student for access to external training, travel and conferences. Excellent applicants from quantitative disciplines with limited experience in environmental sciences may be considered for an additional 3-month stipend to take advanced-level courses in the subject area.

ARIES is committed to equality, diversity, widening participation and inclusion in all areas of its operation. We encourage enquiries and applications from all sections of the community regardless of gender, ethnicity, disability, age, sexual orientation and transgender status. Academic qualifications are considered alongside non-academic experience, and our recruitment process considers potential with the same weighting as past experience.

Applications should be made via the [Royal Holloway Direct website](https://www.rhul.ac.uk/). Please contact alex.dickson@rhul.ac.uk for further information.