Project Background

The understanding of the planetary habitability, in the past, present, and future, relies on an ocean that is suitable for life. Lab analyses have led to a wealth of geochemical data to propose the extent to which areas of the ocean are conducive to both the evolution of life and the ability for life to thrive and survive. These proxies are generally partitioned into those that can provide a local or a global view on the availability of breathable oxygen. In addition to this high resolution models can determine, based on the conditions, how much of the seafloor had ample oxygen. By linking the lab based and modelling approaches we can assess how we incorporate the extent of anoxia in long term ancient and future Earth modelling studies.

Project Aims and Methods

This project will combine data synthesis and various levels of modelling to determine the relative proportions of habitable space in Earth’s oceans through time. Through the use of both local and global redox proxies, the researcher will explore the habitability of Earth through time during periods of both apparent stability and dramatic events such as mass extinctions or evolutionary step changes. The open nature of the project would allow the researcher to develop an interest in specific periods of Earth history or drivers of planetary habitability, but several key questions will be addressed:

1) What was the relative proportion of oxic seafloor throughout Earth history?

2) Does the relative proportion of oxic seafloor play a role in evolution and/or extinction?

3) Is there an association between global and local environmental change, and can this be applied to present and future environmental change?
Candidate
Ideally candidates will have knowledge of, or an interest in key events throughout Earth history or planetary habitability. While a computing background isn’t needed as training will be offered, an interest in developing computer models is advantageous. We value a diverse research environment and welcome and encourage applications from under-represented groups.

Project partners
Expertise in modelling will be provided by the supervisory team at the University of Bristol. Dr Rosalie Tostevin and Dr Richard Stockey will provide knowledge and guidance towards global and local environmental and evolutionary change on varying timescales throughout Earth history.

Training
This project will provide training in cutting-edge modelling for both long term planetary evolution and high-resolution spatial ocean chemistry. The researcher will also interact with world leading international researchers to better understand the capabilities of numerous redox proxies. The student will also be encouraged to participate in personal development courses to develop both technical and personal skills essential for a successful scientific career. Opportunities to present at conferences will be actively supported.

Background reading and references

Useful links
http://www.bristol.ac.uk/earthsciences/courses/postgraduate/

Eligibility
UK and International students are eligible for a University of Bristol Scholarship. UoB Scholarships are fully funded for 4 years and cover university fees, living expenses at the UKRI standard rate, and an allowance of £2000 per year towards research expenses.

Application deadline: Tuesday 16th January, 2024 , 23.59 GMT
(Interviews are expected to take place in mid/late February)

How to apply
Applications are online only at: http://www.bristol.ac.uk/study/postgraduate/apply/
Please select “PhD in Geology” as the programme in the online application system.
Please specify the project title and supervisors for the project that you are applying for.
To ensure your application is considered under the University of Bristol Scholarship funding scheme you must complete the Funding page in your online PhD application as follows:
1. For “What is your likely source of funding?” select Studentship
2. For the free text field “Please give the name of your scholarship or studentship” enter University of Bristol Scholarship.
3. Set “Percentage from this source” to 100%
4. Set “Is this funding already secured?” to No