



Life in ice cold clays: on Earth and Mars

A PhD studentship is available in the groups of [Prof Charles Cockell](#) (UK Centre for Astrobiology, School of Physics and Astronomy) and [Dr Valentina Erastova](#) (School of Chemistry). The studentship is fully funded for 48 months by the [E5 DTP](#) at the University of Edinburgh and covers tuition fees and an annual stipend at the UKRI rate. See [entry and eligibility criteria here](#).

Project summary

The project will study the diversity, functional capabilities, and preservation potential of microorganisms in Icelandic clays.

Project background

Although there is a growing quantity of knowledge about microbial communities that inhabit volcanic rocks, very little is known about the communities that inhabit weathering products of volcanic rocks, such as phyllosilicates (clays). In this project, we will investigate the microbial communities that inhabit clays in cold Icelandic basalts. We will study the diversity and functional capabilities of these organisms and their preservation potential in clays. These insights will have direct applications to understanding the habitability of newly emerging volcanic environments on Earth and the biogeochemical processes that occur in weathered basaltic materials. The work will have application to volcanic terrains on Mars, including the preservation potential of life in Martian clays which are widely reported across the surface of that planet. The project will involve the study of Icelandic materials using instruments on board the ESA Rosalind Franklin rover to provide data for the study of the habitability and potential for life in Martian phyllosilicates.

Key research questions in this project are:

1. What is the diversity and functional capabilities of microbial communities in basalt-derived phyllosilicates?
2. What is the preservation potential of microorganisms in phyllosilicates?
3. What are the biogeochemical activities in microorganisms in weathered cold basaltic terrains?
4. What are the implications of these findings for the colonisation and development of life in early volcanic terrains?
5. What are the implications of these findings for the habitability and preservability of life in Martian basaltic terrains and can we detect them using spacecraft instrumentation?

Further project details – <https://e4-dtp.ed.ac.uk/e5-dtp/supervisor-led-projects/project?item=1693>

APPLICATION DEADLINE - 6 January 2025 at 12:00 noon, GMT

Further information on the application process can be found on the E5 DTP website – <https://e4-dtp.ed.ac.uk/e5-dtp/application-process>

Equality and Diversity

The School of Chemistry holds a Silver Athena SWAN award in recognition of our commitment to advance gender equality in higher education. The University is a member of the Race Equality Charter and is a Stonewall Scotland Diversity Champion, actively promoting LGBT equality. The University has a range of initiatives to support a family friendly working environment. For further information, please see our University Initiatives website: <https://equality-diversity.ed.ac.uk/inclusion/family-and-carer>