**Natural Environment Research Council (NERC) Research Experience Placement (REP) scheme for Undergraduates in Environmental Science (NERC SUPER DTP)**

**Photosynthetic trait assessment of Antarctic snow algae**

**Supervisor**: Dr Matthew Davey, Scottish Association for Marine Science (SAMS)

Snow algae blooms often contain a mix of green, orange and red algal cells, all with different morphologies and life history traits. Within these snow algae communities are a number of algal species, our recent findings show that these individual species have different temperature tolerances and metabolic composition. We also know from field environmental data in Antarctica, that these cells experience a very high levels of photosynthetic active radiation (often above 1000 PAR) at low temperatures (~5’C). In addition to this high light and low temperate, the increased hours of day length in these regions will result in a potentially higher photon load per cell, compared to more temperate located species. We are interested in investigating the physiological traits that enable these cells to function under these abiotic conditions and whether they are indeed uniquely different to other closely related algae.

The objective of this project is to complete a detailed assessment of the photosynthetic parameters of isolated Antarctic snow algae. We are interested in assessing key photosynthetic parameters of our isolated snow algae, such as Fv/Fm, PsiPSII, NPQ and light response curves at a number of growth temperatures. The student will be trained on fluorometry and how to work within good microbiological practice and safety. You will also undertake cell imaging using microscopy and cell staining. We hope that the results will be published in a scientific journal, and the methods developed during the investigation will contribute towards methods for understanding traits involved in the survival of cryophilic algae. The results of this research project will contribute provide valuable information on our larger NERC research project to assess the composition and physiology of Antarctic snow algae communities.

You will be based at the Scottish Association for Marine Science (SAMS) and will work alongside This project will be led by Dr Matthew Davey at SAMS who is a leading expert in snow algae ecology and biotechnology. Dr Davey has considerable experience in sampling and working with these species in Antarctica and in his previous post at the University of Cambridge. The student will be fully integrated into the snow algae project team at SAMS which currently consists of a NERC funded PDRA, NERC E4 DTP PhD student and technical assistance. The student will start the placement with all the required lab safety inductions and specific inductions for the techniques required, such as microscopy and any other photo-physiology techniques. During the placement the student will be involved in all the group meetings either online or in-person. The current larger NERC project has collaborators at the British Antarctic Survey, University of Cambridge and University of Edinburgh. The student will be able to attend all joint project meetings during this time should they overlap and encouraged to present their own project findings. The student will also be encouraged and mentored on report writing and final data presentation skills by Dr Davey. The student will be required to work independently and competently in the laboratory and in the development of the wider academic background to the project, as well as work well as a team member.

This project is funded under the UKRI NERC Research Experience Placements (REP) scheme. The NERC Research Experience Placement (REP) scheme recognises that there is a shortage of individuals with quantitative skills coming into environmental science, and also recognises demographic and diversity-related challenges in the environmental sciences. The REP scheme aims to address this skills gap and under representation by offering funding to support paid summer placements for undergraduate students, providing an opportunity to engage in active research projects, enhance skills, and gain valuable experience of what it is like to be a postgraduate researcher within the environmental sciences.

**Please read the scheme details and conditions here before you apply:** [**https://superdtp.st-andrews.ac.uk/research-experience-placements/**](https://superdtp.st-andrews.ac.uk/research-experience-placements/)

Further reading:

* <https://www.sams.ac.uk/people/researchers/davey-dr-matthew/>
* Davey MP, et al. 2019. Snow algae communities in Antarctica – metabolic and taxonomic composition. New Phytologist. 1242-1255
* Gray A, et al. 2020. Remote sensing reveals Antarctic green snow algae as important terrestrial carbon sink. Nature Communications. https://doi.org/10.1038/s41467-020-16018-w
* Davey MP, Armitage E, Palmer B, Quick WP, Woodward FI. 2018. Cold acclimation duration, photosystem II maintenance and survival in Arabidopsis lyrata spp. petraea. BMC Plant Biology 18 (1), 277

Internship funding is available for 6 weeks during summer 2024.

We encourage applicants to highlight if they are from an under-represented group, as part of the application process; we are required by the funder to complete and report the EDI survey (below) – you are welcome to complete this form and return it with your application.

**Applications, consisting of a motivation letter and one-page CV should be submitted no later than 12pm on Friday 12th July 2024 to** [**recruitment@sams.ac.uk**](mailto:recruitment@sams.ac.uk) **quoting Job Ref ‘D13/24.MD’ in the subject heading.**