PhD position researching controls of algal mortality on the Greenland Ice Sheet

Geographical Sciences and Life Sciences

University of Bristol

The PhD student in this project will be part of an interdisciplinary large NERC grant (BLACK and BLOOM: variations in the albedo of the Greenland Ice Sheet as a result of interactions between microbes and particulates) that combines the glaciological and microbiological expertise of four universities (Universities of Bristol, Leeds, Sheffield and Aberystwyth) to detail the controls and impact of biological activity on the Greenland Ice Sheet on the albedo of the snow and ice surface. This is of current scientific importance because albedo is the key determinant of snow and ice melt, given any specific climatology. This project has the potential to be highly visible within the international research arena. The project will combine the capabilities of the LOWTEX/BIOGAS in Geographical Sciences with the Life Science Facilities in the School of Biological Sciences.

The main aim specific to this PhD is provide the critical understanding of the controls for algal mortality which will help the sensitivity analysis on bioalbedo and its consequences for the melt extent caused by microbial processes on the GrIS.

The PhD will be based in the Bristol Glaciology Centre at the School of Geographical Sciences and with some of the work required to be conducted in Life Sciences. The post requires a background in Environmental Sciences, Geography or Biological Sciences. You will be required to play an important role in the field campaigns in Greenland, with commitments of up to six weeks in the field during the summers of 2016 and 2017.

Figure 1. How important is biology for albedo reduction? Green (left) and red (middle) snow and grey ice (right) photographs with insets showing their respective main inhabitants and associated inorganic debris particles; cell abundance and albedo values for each habitat are from Lutz et al. (2014).
References:

- Boetius, A, Anesio, AM, Deming, JW, Mikucki, JA & Rapp, JZ 2015, 'Microbial ecology of the cryosphere: sea ice and glacial habitats' Nature Reviews Microbiology., 10.1038/nrmicro3522
- Benning, LG, Anesio, AM, Lutz, S & Tranter, M 2014, 'Biological impact on Greenland's albedo' Nature Geosci, vol 7, no. 10, pp. 691-691., 10.1038/ngeo2260

Training opportunities

The student will benefit from being a member of a community of multi-disciplinary scientists. His/her project will also provide a contribution to the project by improving our understanding of the fate of algal biomass at the surface of the Greenland Ice Sheet. He/she will gain considerable training in field craft and field experience during two seasons in Greenland. Survival training and health and safety will be an integral part of the training provided. The development of good organizational skills is an essential element in training a good field scientist. The student will gain a wide range of microbiological skills including culturing, microorganism abundance and biomass estimates, fluorescence and light microscopy, taxonomy including the use of electron microscopy, grazing and growth experiments. As part of the team meetings, he/she will provide short presentations on the progress of the project. Towards the end of the studentship he/she will be expected to make a presentation at national and international conferences. Support and training will be provided in data analysis and handling and in writing articles for publication.

Application procedures:

The closing date for applications is 17.00, 15th February 2016.

Interviews for shortlisted candidates will be hold during March 2016, and the expected start date is April/May 1st, 2016. Informal enquiries are welcome.

The position is funded by NERC and it is only available for UK/EU candidates. It covers University fees, salary and research costs.

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("Programme Choice"), it is "Faculty of Science" and then "Geographical Sciences: (physical): PhD", and for 'Proposed research topic (if known)', put 'Black and Bloom'.