

Glacier & Ice Sheet surveillance by UAV (Unmanned Aerial Vehicle)



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with

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Background

The sustained and systematic manner by which glaciers worldwide are retreating (IPCC, 2013), calls for development of new tools and approaches for icy surveillance. One of the most promising new tools is the unmanned aerial vehicle (UAV) or drone, which allow imagery to be collected in temporal and spatial resolution beyond those offered by conventional satellite remote sensing platforms (Ryan et al., 2014 - <http://www.the-cryosphere-discuss.net/8/2243/2014/tcd-8-2243-2014.html>). Glacier surveillance by drone may therefore cast new light on the rate of environmental change, which will influence future water resources in polar and alpine environments globally.

The Project

This project focuses on the development and application of new sensors suitable for glacier surveillance by UAV including laser, radar and multi-spectral instruments. Underpinning the research is a robust and proven UAV platform capable of autonomous, programmable missions with a range of over 200km. This UAV platform has to date been used to monitor calving dynamics of Greenland's massive marine terminating outlet glaciers (see youtube video - <https://www.youtube.com/watch?v=-y8kauAVaFE>) and monitoring changing albedo across the interior of the ice sheet for the Dark Snow Project (<http://darksnow.org/>).

The ideal candidate will be multi-talented, adaptable and above all, enjoy the field-challenge of using hi-tech equipment in tough environments. He/she will be part responsible for designing, assembling and testing new UAV technology, which will include laser altimetry, laser-induced resonance, acquisition of multiband spectral data and potentially radio-echo sounding, its application and testing at one of many key cryospheric targets in Greenland (or elsewhere) to monitor ice dynamic changes and, finally, processing & analysis of resulting datasets.

If you think you are up to the challenge – please get in touch (abh@aber.ac.uk)

References:

IPCC, 2013. Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom.

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