

## **“CASLab”: The United Kingdom’s Clean Air Sector Laboratory at Halley Research Station, coastal Antarctica**

Neil Brough<sup>1</sup>, Anna E. Jones<sup>1</sup>, S. Thomas Barningham<sup>2</sup> and Andrew C. Manning<sup>2</sup>

<sup>1</sup> British Antarctic Survey, Cambridge, UK

<sup>2</sup> Centre for Ocean and Atmospheric Sciences, School of Environmental Sciences, University of East Anglia, Norwich, UK

Corresponding author: Neil Brough: nbro@bas.ac.uk

In 2003, a new laboratory (“CASLab”) was commissioned at the Halley Research Station in coastal Antarctica (75.61°S, 26.21°W), dedicated to studies of the clean background atmosphere and air/ice exchange processes with the snow. With its position near the edge of the Weddell Sea, the CASLab is well placed to capture air masses with a variety of origins, including from the Antarctic continent, over the sea ice zone and over the open ocean. Since its inception, the laboratory has been run in a dual mode, with specific measurement campaigns operating alongside long-term observations such as greenhouse gases.

Here we introduce the laboratory and the instrument suite, and present the type of measurements that we are now able to make. While operated by the British Antarctic Survey, we also support measurements and instruments from several UK and overseas collaborators, including NOAA, USA, University of Groningen, The Netherlands, and UEA, UK.

Of particular relevance to GGMT, we present our greenhouse gas-related in-situ instruments, namely a Picarro CO<sub>2</sub>/CH<sub>4</sub> analyser, a Los Gatos Research N<sub>2</sub>O/CO analyser, and a custom-built O<sub>2</sub>/CO<sub>2</sub> system that incorporates a Sable Systems “Oxzilla” O<sub>2</sub> analyser and a Siemens “Ultramat 6E” CO<sub>2</sub> analyser.