

Clouds in Adelie Land, Antarctica: from the coast to the inner Plateau

The ERC Synergy funded project AWACA aims to understand the atmospheric branch of the water cycle over Antarctica. It will rely on innovative observations of the tropospheric meteorological conditions and the isotopic composition of water vapor and hydrometeors along a 1100-km transect between the Dumont d'Urville station at the coast and the Concordia station on the high inner Antarctic plateau. The interpretation of those observations will benefit from dedicated modelling developments, and the gain in process understanding will in turn allow to improve global and regional climate and weather models over Antarctica. The interactions between cloud and precipitation microphysical processes and isotopic composition are of particular interest.

In the framework of AWACA, a PhD position is opening related to the characterization of the macro- (occurrence, altitude, depth...) and micro- (phase, processes...) physical properties of clouds, from observations collected using collocated Doppler profiling radars working 35 and 95 GHz as well as a 532-nm lidar, deployed at five locations along the transect. The main objectives are:

1. Derive robust statistics of the cloud macrophysical properties at each site, quantify and analyze their spatial and seasonal variability along the transect.
2. Implement and/or develop multiple-frequency spectral retrieval approaches to obtain information about the dominant microphysical processes (e.g. vapor deposition, riming, aggregation, sublimation), the typical particle size and the particle size distribution (PSD) along the column.
3. Specifically investigate the properties of fog, boundary layer and large-scale clouds at Concordia on the high Plateau (including the seasonal variability).

We are looking for a creative and energetic PhD student to achieve the objectives listed above. There could be field work in Antarctica. Funding is available for 4 years through the AWACA ERC grant, with a competitive salary (starting at 54 kCHF/year). Review of the applications will continue until the position is filled.

The PhD project will be supervised by Prof. Alexis Berne and will be conducted in close collaboration with PhDs and Postdocs working for AWACA but also for other thematically related projects.

Applicants should have a Master degree in Environmental Sciences/Engineering, Physics, or a closely related field, with a keen interest in meteorology/atmospheric sciences/remote sensing. The project will involve data processing/analysis, and programming skills are expected. Proficiency in spoken/written English is mandatory, knowledge of French would be an advantage. Applications should be sent to alexis.berne@epfl.ch and should include a CV, a statement of research interests and qualifications, academic transcripts (BSc and MSc) and contact details of three academic referees, all in pdf format.

Contact

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