The epic search for oldest ice in Antarctica

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Rapid access drilling at potential drill site Little Dome C. Massimo Frezzotti, Enea, Italy. Credit: Robert Mulvaney

On 1st June 2019, the European Beyond EPICA Oldest Ice Core project started with the aim of drilling for and recovering ice from up to 1.5

million years ago in Antarctica. The previous EPICA project recovered ice from 800,000 years ago. The new project aims to go beyond that. The new core will provide information on the greenhouse gases present during the Middle Pleistocene Transition (MPT), which occurred between 900,000 and 1.2 million years ago. During this period, the climatic periodicity transitioned from 41,000 to 100,000 years between ice ages. Why this change happened is the mystery scientists want to resolve.

To do this, experts from 10 European Countries and 16 different Research Institutions have joined forces under the guidance of Carlo Barbante and his management team at the CNR and Ca' Foscari University of Venice in Italy, funded by the European Horizon 2020-research programme.

The drilling site, at Little Dome C, was previously identified by an EU funded geophysical survey project, led by Olaf Eisen from the Alfred Wegner Institute in Germany. The drill site was presented during an EGU press conference in Vienna on 9th April 2019. Luckily it is only 40 km from Concordia Station, the Italian-French base on the high Antarctic Plateau at Dome C, over 1000 km from the coast and at an altitude of 3233 m above sea level, run by IPEV and the PNRA, the French and Italian polar agencies. Here on a balmy summers day the temperatures reach a maximum of -25°C, while in the deep mid-winter, they drop to under -80°C. It may seem absurd while sitting on three kilometers of water, but Dome C is as dry as the Sahara Desert, so snow accumulates slowly, gradually trapping the precious air bubbles in the ice, which researchers hope to analyse to find the atmospheric composition of the deep past. Careful analysis of the isotopic ratios of this ancient ice will be serve as a deep time thermometer.

Barbara Stenni of Ca' Foscari University of Venice, says, "We hope to study the climate of the past to improve our models of future climate

change." The whole project will cost around 11 million € and will take six years in total to drill, collect and analyse the ice from this very deep hole if everything goes to plan.

More information: www.beyondepica.eu/

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