Beyond EPICA returns to Antarctica: the third deep drilling season has just started

While the sun starts rising again in Antarctica, the Beyond EPICA 23/24 team has started the third drilling season in Little Dome C. Just a few kilometers away from Concordia Station, the remote camp of LDC will host researchers and technicians from Europe involved in the third ice core drilling campaign of the international research project Beyond EPICA, coordinated by the Institute of Polar Sciences of the CNR (National Research Council of Italy). By analyzing ice cores extracted from the deep ice in Antarctica, the project aims to obtain information dating back to 1.5 million years ago, regarding the evolution of temperature, the composition of the atmosphere, and the carbon cycle. A team of 16 people will work for two months in the middle of the Antarctic plateau, challenging extreme weather and time to reach the best results

In the remote field camp of Little Dome C, Antarctica, just a few kilometers away from Concordia Station, an international team made up of 16 researchers and logistics personnel has started the third deep drilling campaign for the European project Beyond EPICA - Oldest Ice. They will work for over two months on the Antarctic plateau at 3.200 meters above sea level, where the average summer temperature is -35°C. Over the next few years, the analysis of an ice core extracted from the surface to a depth of 2.7 km will enable the reconstruction of the world's climate history going back in time 1.5 million years to reveal information on temperature and on the concentration of greenhouse gases in the atmosphere.

"This ice core will give us information on the climate of the past and on the greenhouse gasses that were in the atmosphere during the Mid-Pleistocene Transition (MPT), which happened between 900,000 and 1.2 million years ago," says Carlo Barbante, coordinator of the project, director of the Institute of Polar Sciences of the National Research Council of Italy (CNR-ISP) and professor at Ca' Foscari University of Venice. "During this transition, climate periodicity between ice ages changed from 41,000 to 100,000 years: the reason why this happened is the mystery we hope to solve."

The project has been funded by the European Commission with 11 million euros, is coordinated by the CNR Institute of Polar Sciences, and involves twelve European research institutes. In addition to the CNR and Ca' Foscari University of Venice, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) is in charge, together with the French Polar Institute (IPEV), of managing the logistics.

The activities of the Beyond EPICA - Oldest Ice project benefit from a synergy with the research conducted in the framework of the Italian Antarctic Research Programme (PNRA), which is funded by MUR, and coordinated by the CNR (scientific activities) and by ENEA (campaign management).

"In the previous campaign, despite the prohibitive weather conditions and some problems with the drilling equipment, the team worked really hard reaching the depth of 808 meters" says Barbante. "This year a laser spectrometer, operating at Concordia Station, will be used to analyze almost in real time the oxygen and hydrogen isotopic composition of the freshly extracted ice brought from Little Dome C; this will allow to instantly detect the climate cycles, providing a preliminary dating of the core".

Little Dome C is an area of 10 km2, located 35 km from the Italian-French Concordia Station — one of the most extreme places on the Earth — and the personnel involved in the drilling season will work there from mid-November 2023 to the end of January 2024.

Just like an ancient book, the Antarctica ice sheet has registered and conserved the environmental history of our planet. Researchers will be able to determine the content of greenhouse gases, such as methane and carbon dioxide, in the atmosphere of the past, linking these findings to how the temperature evolved and revealing information about the climate of the last 1.5 million years.

The Beyond EPICA project is now at the third drilling season and will continue till 2026: a European scientific and logistic effort based on cooperation and innovation.

The members of the 2023/2024 team:
Olivier Alemany and Philippe Possenti from Centre national de la recherche scientifique, Rémi Dallmayr, Matthias Hüther, Gunther Lawer, Johannes Lemburg from Alfred Wegener Institute, Saverio Panichi and Andrea Ceinini from ENEA, Ines Gay from IPEV, James Veale from British Antarctic Survey, Federico Scoto from CNR Institute for Atmospheric and Climate Science, Michaela Mühl and Fortunat Joos from University of Bern, Julien Westhoff, Iben Koldtoft, Tamara Gerber from University of Copenhagen.

To learn more about Beyond EPICA Oldest Ice: http://www.linktr.ee/BeyondEpica_OldestIce

Photos:
Beyond EPICA Field Seasons Gallery: https://www.beyondepica.eu/en/gallery/field-seasons/

Videos: https://www.beyondepica.eu/en/outreach-communication/beyond-epica-on-youtube/

In brief

What: beginning of the third ice core drilling campaign for the European project Beyond EPICA - Oldest Ice

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This project has received funding from the European Union Horizon 2020 research and innovation programme under grant agreement No. 815384

The project has also been supported by national partners and funding agencies in Belgium, Denmark, France, Germany, Italy, Norway, Sweden, Switzerland, The Netherlands and the United Kingdom.