

Little Dome C

Beyond EPICA Oldest Ice Drilling Site (75.29917 °S, 122.44516 °E)

Situation Report #11, 27th November 2025

Personnel @LDC:

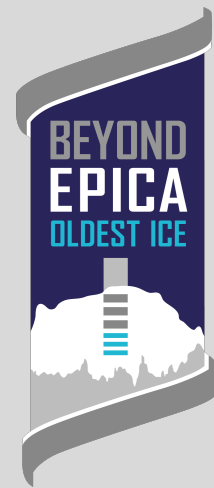
Carlo Barbante (UNIVE, CNR-ISP, PI in the field), Gianluca Bianchi Fasani (ENEA, Camp Leader), Katrin Ederer (AWI), Matthias Hüther (AWI, Chief Driller), Marion Lahuec (IPEV), Gunther Lawer (AWI), Johannes Lemburg (AWI), Barbara Seth (UNIBE), Mohammad Vafadarmianvelayat (AWI), Chiara Venier (CNR-ISP), Sergio Zannini (ENEA)

Personnel @DC:

Philippe Possenti (CNRS)

Weather at LDC: sunny and cold

Meteo at DC 08 pm: T = -31.2 °C, Wind speed = 6.3 kt, Windchill T = -41°C, Humidity = 67 %



The sun continued to blaze over the white expanse of Little Dome C as the Beyond EPICA team embarked on a day of meticulous preparations, focused entirely on the ultimate goal: piercing the ice-rock interface and retrieving the ancient bedrock beneath.

Today was defined by precision and patience. Given that the drilling fluid is still heavily populated with icy particles suspended from the deepest layers of the ice sheet, the team executed two extended runs of hole cleaning. This process is crucial, acting like a sophisticated filtration system to ensure the borehole is pristine and ready for the sensitive operation to come. The preparation for the rock drilling phase must be absolutely painstaking.

As the day wrapped up and all equipment checks were finalized, the decision was made: the rock drill was ready to be lowered. The objective is extremely important and challenging: to retrieve the precious ice immediately adjacent to the bedrock and, critically, the rock core itself.

Switching from ice coring to rock coring involves significant technical adjustments. While the standard ice corer extracts a substantial 100 mm diameter core, the rock corer must be used to retrieve a much narrower sample, only 34 mm in diameter. This reduction is purely physical; the rock's resistance to penetration is immense, requiring a smaller diameter to allow the same motor configuration to effectively cut the bedrock. To further aid penetration, the rock corer is considerably weighted, carrying approximately 240 kg of lead and iron ballast.

The moment of truth arrived around midnight when the core barrel was pulled up. The "catch of the day" was a small but invaluable core of 15 cm, consisting of 7 cm of ice filled with fine brownish debris. This mixed sample is a geological treasure trove, destined to provide the geologists with crucial clues about the origins and history of this extraordinary continent.

Immediately upon retrieval, the sample was handled with extreme care: treated in darkness, using only red light. This measure is vital to prevent any photochemical reactions in the samples—red light has minimal energy—preserving the sample's bio- and photo-chemical state as close as possible to its natural in situ environment. The core was then wrapped in aluminium foil and stored away from light.

The team will attempt a new rock drilling run tomorrow, aiming to retrieve the actual bedrock sample.



On the scientific processing front, we can happily confirm that, after a few predictable hitches, the Swiss Saw is up and running smoothly, allowing the initial core processing to start efficiently, when the first ice will pop up.

The current focus is now shifting to the installation and calibration of the Dielectric Property (DEP) device. For non-specialists, the DEP is an extraordinary tool that allows scientists to "see inside" the ice without melting it. It works by scanning the ice core to detect electrical conductivity variations. These variations reveal layers, impurities, and a detailed record of past volcanic events and climate shifts, essentially allowing us to read the ice's hidden diary.

The vital work of maintaining the camp continued routinely. Sergio and Gianluca's effort in keeping the camp running at full efficiency is truly outstanding. From the daily rounds checking the stove and generator tanks, to emptying grey water, tackling the inevitable thousand small technical issues, and yet still managing to serve freshly baked bread every morning and delicious gourmet meals for lunch and dinner—we are incredibly well looked after. A huge thank you to the logistics heroes!



The Beyond EPICA rock drill head ready to be deployed in the abysses. Photo: B. Seth





Left picture. Working in the dark in the science trench to log the first precious piece of ice retrieved at the interface between ice and rock. It consists a samples of 15 cm, 7 cm of ice filled with fine brownish debris. Right picture. Guess who is who!. Photo: C. Venier

CB, GBF, BS & MH; LDC, 27.11.2025

