

Little Dome C

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

Situation Report #14, 30th 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), Philippe Possenti (CNRS), Chiara Venier (CNR-ISP), Sergio Zannini (ENEA)

Personnel @DC:

Mohammad Vafadarmianvelayat (AWI)

Weather at LDC: sunny and cold

Meteo at DC 08 pm: T = -32.4 °C, Wind speed = 7.2 kt, Windchill T = -43°C, Humidity = 68 %



The rhythm of life at Little Dome C adjusted slightly today as the calendar flipped to Sunday. Resting is an essential ingredient in the high-stakes environment of deep ice core drilling, and our team adheres to a flexible but critical schedule: Saturdays typically wind down mid-afternoon, and Sundays kick off around noon. However, the exact timing always remains fluid, dictated by the relentless demands of the Drilling Trench and the Science Trench.

The focus in the drilling arena remains firmly on refinement and testing. Our engineers and drillers are constantly tweaking and iterating on the deep-drilling instrument, running successive tests with various configurations to optimize performance.

Today, we executed two drilling runs. While these didn't yield usable core samples, they were invaluable, demonstrating continued, measurable improvements in the system's operation. The entire setup is now primed, and tomorrow—Monday—we are scheduled to employ a new drill configuration that crucially incorporates a core catcher. This small but vital component is designed to secure any ice that is drilled, ensuring the recovery of the precious sample.

In a recent innovation, sharp-eyed observers of our photos may have noticed a specialized protective shield being deployed in the drilling trench when the lowest section of the core barrel surfaces. This is a crucial element of our preservation strategy, particularly as we anticipate reaching the ice-bedrock interface at 2800 meters.

It is paramount that we shield cores from the deepest, oldest ice from light exposure upon their recovery. Once brought to the surface, light — specially UV radiation — can rapidly and permanently alter both the physical/chemical signatures and any biological traces present in the sample. Light can trigger reactions that modify sensitive minerals or degrade rare organic molecules, compromising the integrity of our data. Intense light can also interfere with future optical or luminescent analyses. Furthermore, if the ice-bedrock contact zone harbors microorganisms adapted to total darkness, light exposure could damage or kill them, preventing study of their original state.

This sophisticated protection system is housed in a brilliantly home-made light-tight cylinder—a testament to the resourcefulness of the Beyond EPICA 2024-25 Team. Constructed simply from black rubbish bags and



circular metal rings approximately 50 cm in diameter, the 2-meter-long cylinder has been affectionately named "The Sausage." It is a shining example of field ingenuity meeting scientific necessity.

Meanwhile, the Core Processing Line continues to be developed and implemented, ready to systematically catalog the core samples as they progressively arrive on the surface.

The day brought a welcome visit from personnel from Concordia Station. This trip was essential for two reasons: it delivered Philippe Possenti, the final component of the Beyond EPICA Team for the 2025-2026 season, ensuring a full roster for the push ahead. However, it also marked the temporary return of Mohammad Vafadarmianvelayat to Concordia for a slight back-pain issue. We wish him a swift recovery.

The trip was also an opportunity to restock on succulent food supplies (always a morale booster!) and perform a key equipment swap: our current washing machine seemed unwilling to tolerate the harsh LDC environment, so a replacement was duly installed and some problems solved.

Overall, today was a complex, necessary, and ultimately relaxing Sunday, providing the necessary recharge before the intensified drilling schedule begins tomorrow.



The shield protection of the drill core, "The sausage", lying on the logging bench, and in use when the drill core pops up at the surface. The full operation implies the synchronization of about three person maneuvering a set of four cords like professional puppeteers. Photo, C. Barbante, G. Bianchi Fasani





The few fresh Cantucci, prepared by Chiara, that survived after Sunday night. Photo C. Venier

CB, GBF, BS & MH; LDC, 30.11.2025

