

## Little Dome C

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

### Situation Report #16, 2<sup>nd</sup> December 2025

#### Personnel @LDC:

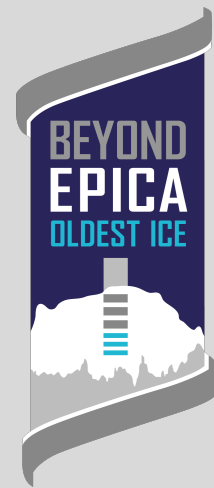
Carlo Barbante (UNIVE, CNR-ISP, PI in the field), Gianluca Bianchi Fasani (ENEA, Camp Leader), Katrin Ederer (AWI), Matthias Hüther (AWI, Chief Driller), Marion Lahuec (IPEV), Gunther Lawer (AWI), Johannes Lemburg (AWI), Barbara Seth (UNIBE), Philippe Possenti (CNRS), Chiara Venier (CNR-ISP), Sergio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

#### Personnel @DC:

Mohammad Vafadarmianvelayat (AWI)

**Weather at LDC:** sunny and cold

**Meteo at DC 09 pm:** T = -31,5 °C, Wind speed = 5.5kt, Windchill T = -41°C, Humidity = 66 %



Today's report from the frozen frontier of Little Dome C is all about trouble shooting and getting hands-on. While we didn't get any new deep rock/ice, the team spent the entire day in a highly productive "problem-solving mode", tackling two distinct, yet crucial, challenges to ensure the project's success.

The first order of business was on the drilling tower itself. Our engineers identified a slight, but notable, lean in the mechanical components of the tower. While not severe enough to completely compromise its function, the team took proactive steps to make necessary modifications and adjustments. This kind of precision engineering is essential when operating equipment under the extreme conditions of the Antarctic plateau. The good news is the drilling tower is back to being an active, well-aligned piece of kit.

The second, and arguably more intricate, challenge is directly related to reaching the bedrock. As we transition from drilling through ice to using the rock drill near the bottom of the bore hole, we face a delicate issue: preventing the water present at the bottom of the hole from freezing. Since the rock drill bits are not optimized for penetrating ice, a frozen base would bring the operation to a screeching halt.

Our solution is a concept borrowed from medicine: targeted drug delivery. We need to deliver a specific "dose" of high-density, anti-freeze drilling liquid exactly to the basal part of the bore hole, which sits at 2800 meters beneath the surface. Easy to say, highly challenging to do!

We have now a few options in hands and we'll optimize one of them for the deployment tomorrow.

We plan to lower a camera down the hole tomorrow to confirm that the operation was a success and the critical anti-freeze liquid has dispersed as intended.

In the scientific trench, the long and labor-intensive calibration procedure for the DEP system has begun. The DEP is a key instrument for measuring the electrical conductivity of the ice core, which provides rapid, high-resolution data on the core's stratigraphy and chemical properties.

We are in direct contact with our colleague, Frank Wilhelms at Bremerhaven, to carry out the fine-tuning of the system. This level of real-time, high-precision collaboration is made possible by the truly extraordinary speed of the internet connection here at Little Dome C, allowing for perfect interaction with colleagues and families back in Europe. We expect the DEP calibration to conclude successfully tomorrow.



Logistical activities across the camp have proceeded exactly as planned. From keeping the machinery running to ensuring the team is well-fed and supported, our dream team is successfully maintaining all field operations, which is the backbone of our scientific mission.

---



Highly sophisticated science 😊 to fill the lowermost part of the borehole with 165-Estisol, the high density drilling fluid. Photo B. Seth and K. Ederer



The white valve at bottom of drill opens when touching the ground (graft will be pushed in like a cork and fluid gets out, so the idea). Let's see if it work. Photo, B. Seth

CB, GBF, BS & MH; LDC, 02.12.2025

