

Technical Innovations of the BEOI Field Seasons

Tuesday 16 September 2025 12:45 (20 minutes)

This presentation is a concise collage of technical innovations and their usefulness in the latest field seasons of the Beyond Epica Oldest Ice drilling project. Improvements were made with the following newly developed equipment:

- Replacement drill-head for filtering of the borehole.
- Fine slush filtering with the drills shaft within the chip chamber.
- Daily maintenance routines and de-icing of the drills shaft and pump.
- Glove box for drying and warming of drillers gloves.
- Jig for sharpening of drillhead cutters. (please see also the presentation “Drillhead Configurations and Maintenance in the BEOI’s Deep Ice Core Drilling Project”
- Temperature logging of the bore hole.
- 3D printing in the field.
- 1. custom made medical finger orthosis
- 2. Light-Diffusor for illumination of ice-core crystal observation.
- 3. Clamps for aligning a tape ruler on an ice-core for logging
- 4. Clamps for marking the ice-core for cutting.
- 5. Improvements to the support of ice-cores for cutting with a rotational saw.
- 6. Ice-core scraper (please see also the additional talk)
- 7. Team building with BEOI cookie-cutters.
- Devices for cutting ice-cores without the material losses of a saw kerf.
- Vial holders for transport of ice-samples and handling of liquid in the lab.
- Fine filtering of recycled drill liquid.
- Lessons learned with recycling drill liquid by ice-melting. Challenges with plastic material and leaking hoses in contact with warm drill liquid and Hose handling.
- Light-tight covers for handling ice-cores in the dark.
- Scooper for collecting firn samples.
- Safe and efficient work environment: Improved stairs and steps, floor gratings in front of doors, custom build shelves, repair of shovels.

Primary author: LEMBURG, Johannes

Co-authors: HÜTHER, Matthias (Alfred-Wegener-Institute Helmholtz Center for Polar and Marine Research); Mr LAWER, Gunther (Alfred-Wegener-Institut); LEONHARDT, Martin (Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung, Bremerhaven, Germany); WESTHOFF, Julien (Niels Bohr Institute, University of Copenhagen); Mr SCOTO, Federico (National Research Council - Institute of Polar Sciences); Ms GAY, Inès (Institut polaire français Paul-Emile Victor); ARDOIN, Lisa (Université Libre de Bruxelles, Brussels, Belgium); Ms SOUSSAINTJEAN, Lison (University of Bern); SETH, Barbara; Ms BOUCHET, Marie (Centre national de la recherche scientifique); Prof. WILHELMS, Frank (Alfred-Wegener-Institut Helmholtz-Zentrum für Polar- und Meeresforschung)

Presenter: LEMBURG, Johannes

Session Classification: Oral sessions

Track Classification: Mechanical Ice drilling