https://www.globalneutrinonetwork.org/

News from the experiments

KM3NeT

4 new detection units installed in ORCA: Mid of May, a sea operation at the ORCA site was performed with a twofold purpose: the recovery from the sea bottom of some oceanographic instruments which required some maintenance and the installation of a set of 4 new detection units. The number of detection units in ORCA has thus been increased to 28.
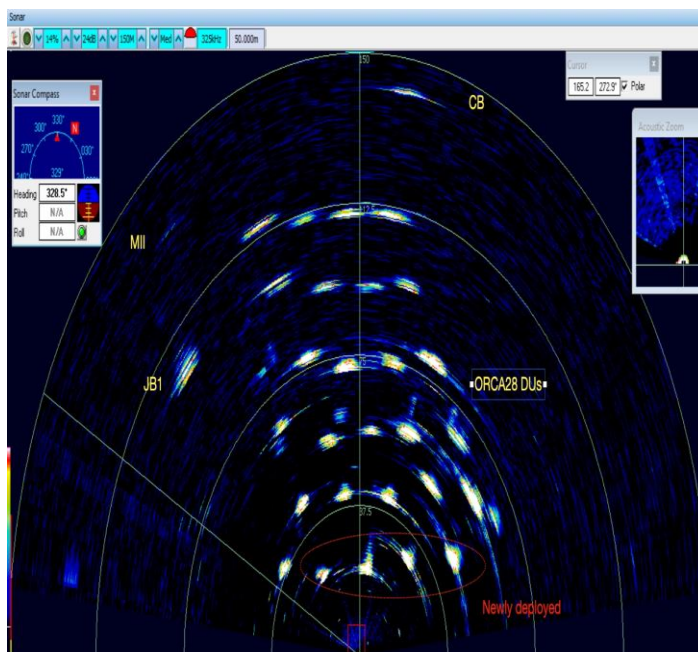
This is a sonar map of the ORCA site after the installation of the new detection units. Also marked in the image are the various components of the submarine infrastructure, comprising a junction box ("JB1"), a module for interface with oceanographic instrumentation (Module Interface Instrumented – MII) and a calibration structure (Calibration Base – CB).

As usual, the operation was performed with two ships: the *Castor* of Foselev, for deployment of the detection units, and the *Janus II* of SAAS (formerly Comex), equipped with the Apache deep-sea remotely operated vehicle, for submarine operations.

Everything worked very smoothly, thanks to the crews offshore as well as to the team who performed the functional tests of the new detection units from the shore station!

The Castor at the end of the sea campaign.

IceCube

Erin O'Sullivan (Univ. Uppsala) took over from Ignacio Taboada as new IceCube spokesperson on May 1st.

Read an interview with Erin and Ignacio at https://icecube.wisc.edu/news/collaboration/2025/04/erin-osullivan-elected-icecubes-next-spokesperson/

The spring IceCube Collaboration Meeting in Uppsala took place from May 12 to May 16. It included the announcement of the 2025 IceCube Impact Awards.

The Individual Impact Awards went to:

Giacomo Sommani *"for tireless efforts to improve the performance and robustness of the reconstruction of IceCube realtime alerts."*
Sarah Mechbal *"for leadership and coordination of the characterization and acceptance testing of IceCube Upgrade mDOMs, while fostering a cooperative communication environment."* and
Christoph Günther *"for leadership and coordination in the development and testing of the mini-mainboard, an integral part of future IceCube instrumentation."*

The Group Impact Award went to:

Bennett Brinson, Jimmy Delauney, Hannah Erpenbeck, Philipp Fürst, Sam Hori, Niclas Krieger, Karlijn Kruiswijk, Michael Larson, Sarah Mancina, Jesse Osborne, Larissa Paul, Steve Sclafani, Timo Stürwald, and Jan Weldert *"for the development of the next generation online and offline filtering and event selection for all IceCube data."*

Meanwhile, everything is OK at the South Pole, the uptime is > 99.8% as usual, and a wonderful moon with its halo created an atmosphere as if the icy landscape was painted:

The only trouble was created by snow storms which almost buried the camp with the stored IceCube drilling equipment. Some of the snow drifts are as tall as the milvans (note the size of the person on one of the roofs lefthand): Much work for the next season!

Baikal-GVD

The GVD collaboration will hold the spring collaboration meeting on June 3-6 in Dubna.

P-ONE

The Pacific Ocean Neutrino Experiment (P-ONE) has reached a key milestone with the successful assembly of its first complete cable line, P-ONE-1. At the MacArtney facility (Esbjerg, Denmark), 1 km of hybrid subsea cable and 20 terminated titanium rings—including all fiber and copper connectivity—were integrated into the mechanical structure that also serves for spooling, transport, and deployment. Each titanium ring will later be connected to two glass sensor hemispheres housing PMTs, cameras, calibration devices, and associated electronics. The assembled unit will now be shipped to TRIUMF in Canada, where final integration with photodetectors, the mainboard, and the string junction box will take place. The next two pictures show the subsea cable with titanium rings (Image credit MacArtney and P-ONE Collaboration).

They study a methodology – deep stacking – that exploits correlations between observed neutrinos and comprehensive catalogs of potential source populations, including faint, high- redshift sources. By stacking signals from numerous weak sources and optimizing source weighting, significant gains in sensitivity can be achieved, particularly in the low-background regime where individual high-energy neutrinos dominate. They provide a semi-analytic framework to estimate sensitivity improvements for populations of sources under various background scenarios and redshift evolutions. They demonstrate that deep-stacking can increase detection sensitivity by a factor of 3–5, enabling detailed population studies. In the second paper, they show that a Bayesian framework is well-suited to carry out such statistical probes, both in terms of detection and property reconstruction. After presenting an introductory explanation to the relevant Bayesian methodology, they demonstrate its utility in parameter reconstruction in a simplified case, and in delivering superior sensitivity compared to a maximum likelihood search in a realistic simulation.

Publications

I did not find any new papers authored by a full collaboration. Instead, I want to point the GNN readers to a very nice overview of the emerging landscape of high-energy/ultra-high-energy neutrino experiments in CERN Courier for May/June, written by Lu Lu (University of Wisconsin):

https://cerncourier.com/a/discovering-the-neutrino-sky/

Also, I want to draw your attention to two papers written by Marek Kowalski, Markus Ackermann (DESY) and Imre Bartos (Florida University):

*The promise of deep-stacking for neutrino astronomy (*https://arxiv.org/abs/2501.10213) and

*Bayesian Deep-stacking for High-energy Neutrino Searches (*https://arxiv.org/abs/2502.01452