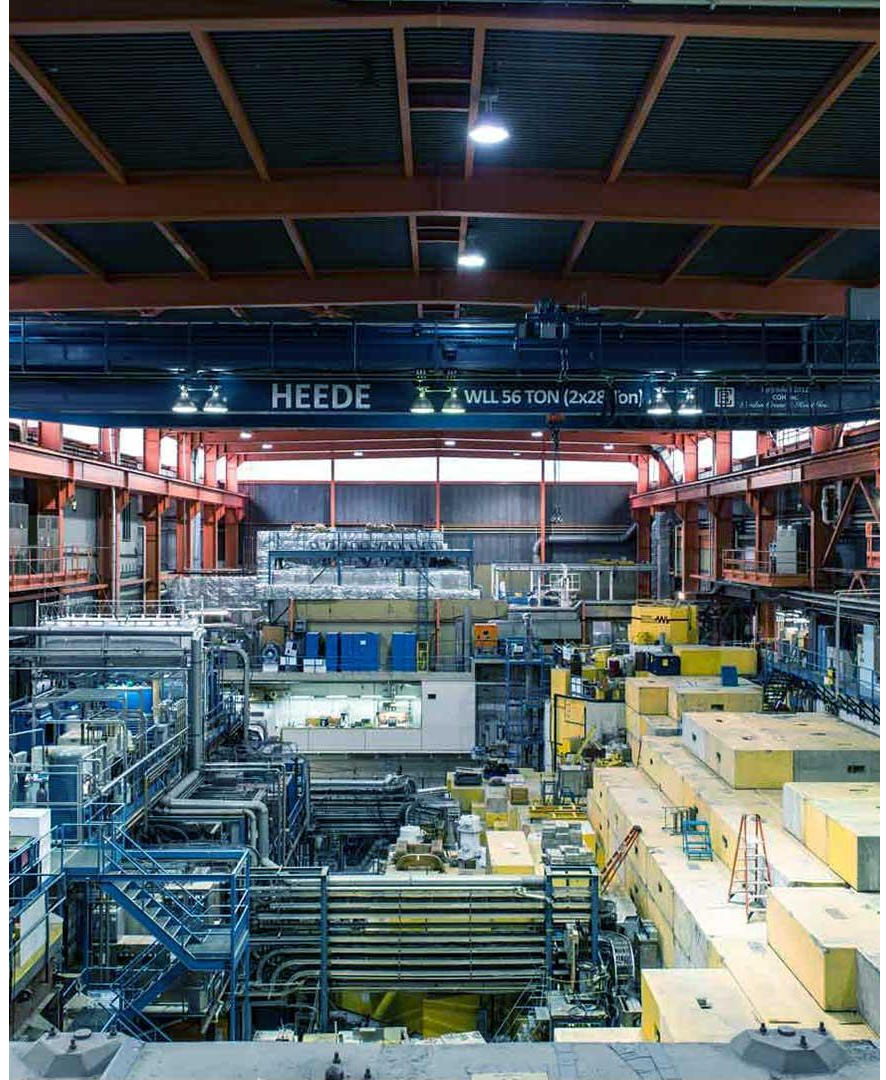


PLENvM @ ONC

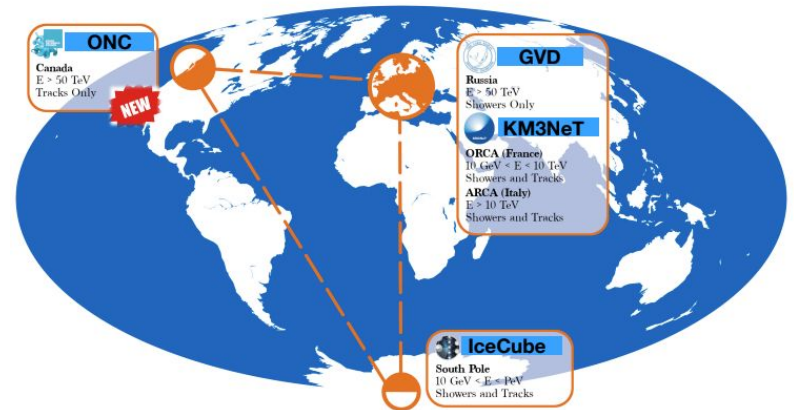
Pietro Giampa
TRIUMF



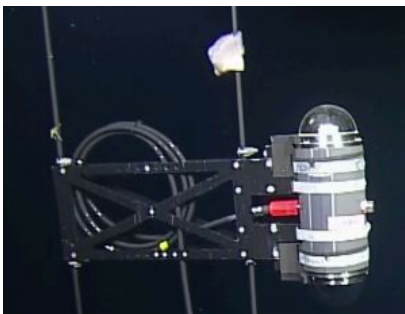
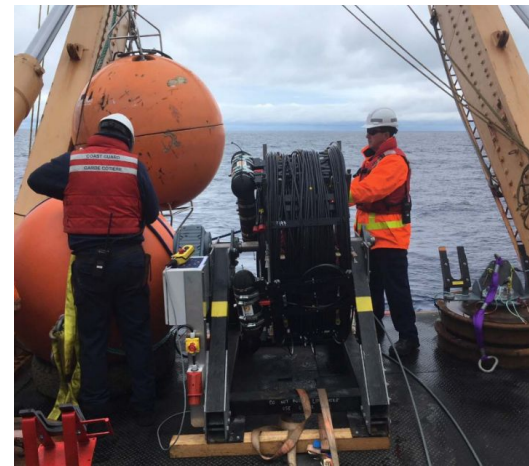
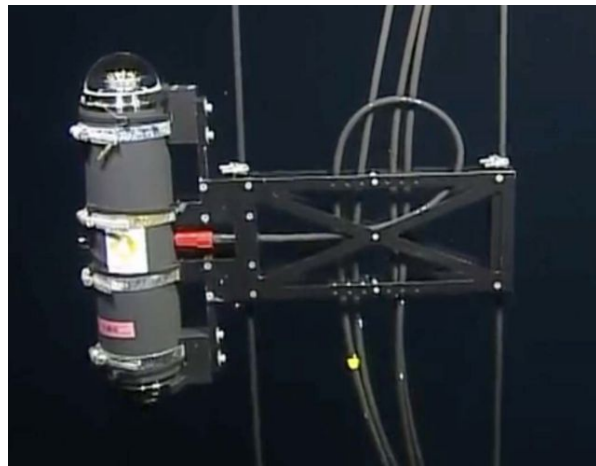
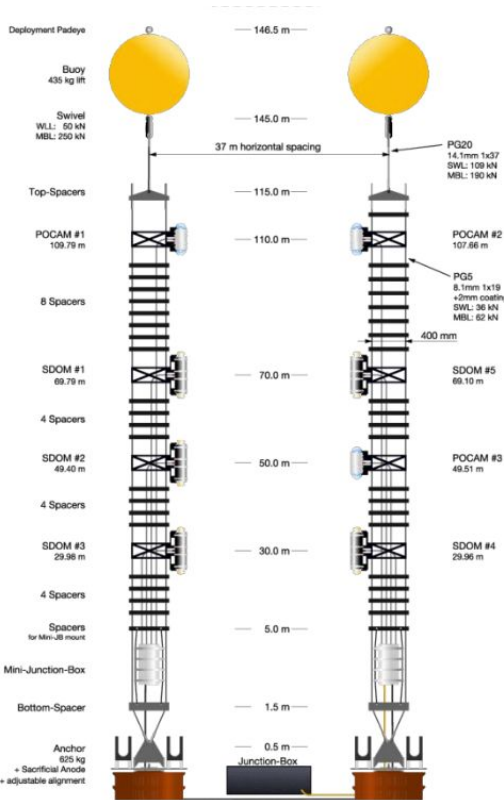
Scientific Goals

- Studying and tagging Astro-source of neutrinos (Blazers, etc.).
- Enhance the Multi-Messenger Astronomy Program.
- Enriching the Global Neutrino Network (GNN).
- Study of Neutrino Mass Hierarchy by using tau neutrinos with different L/E combination (complementarity with LBN).
- Dark Matter Annihilation studies (possible analysis combination with IceCube).

Benefit from an incredible infrastructure and unique expertise in deployment and maintenance of underwater equipment and solid understanding of the marine environment.



Deployment of 1st Prototype (STRAW)



First Attenuation Length Results:

405 nm: 17.2 m +/- 0.7 m (stat.) +/- -3.0 m (sys.)

465 nm: 32.7 m +/- 1.5 m (stat.) +/- -5.0 m (sys.)

Proposed Timeline:

Phase 1

10-20 Strings
0.1 km³ Volume

Based on current technology, no specific optimization.

Threshold > 50 TeV

Timeline: **2024**

Phase 2

100-200 Strings
2.0 km³ Volume

Shared R&D for photo-module with IceCube, optimized for showers.

Threshold > 50 GeV

Timeline: **2027**

Phase 3

500 Strings Modules
50 km³ Volume

Will require some optimization of the OCN facility for power and internet distribution.

Threshold > 50 TeV

Timeline: **2030**

Proposed Timeline:

1. Aside from the already deployed 2 strings prototype (STRAW), the plan is to deploy first a 10-20 string array (0.1 km³ volume) by 2024. The current projected cost is ~8M CAD, with already 2.5M euro guaranteed from Germany, and 1M USD from Michigan State. The strategy for this first array is to do some physics (catch some low-hanging fruits), but mostly do preparation/demonstration for the big array. UofA and Queen's are planning for a CFI proposal to support this (order of 4M CAD). ONC will support the deployment procedure and data-flow.
2. 100-200 strings array, 2 km³ volume, by 2027. Personally, I find the timeline very aggressive, but deployment-wise they certainly proved that they can make it happen in this time-frame. Funding will be a big issue, as this will require a large Canadian collaboration. The goal here is to do full physics as listed above. Currently, this phase is budgeted at around 30-50M Euro (40-70M CAD) assuming linear scalability which might be an overestimation according to the project lead.
3. 500 string, 50 km³ volume, by 2030. Very aggressive schedule, the main goal will be to create the ultimate Astro-neutrino detector (directly complementary to the upgraded Ice-Cube). Currently, the budget for this phase is ~200-300M Euro. No concrete ideas yet on how to tackle fundings. ONC would require a grid/node upgrade for this version.