

# Neutrino group wish-list

## 1) CR CNRS position (if not assigned to LPNHE in 2025)

*Justification:* Following the recommendations of the LPNHE and IN2P3 Scientific Councils the LPNHE-Neutrino group is currently fully involved in the Japanese neutrino program. This program consists in continuation of the **T2K** experiment (T2K-II project), where we have leading roles in the recently finalized near detector **ND280 Upgrade**, and in preparation of the **Hyper-Kamiokande** (HK) project, the experiment of the next-generation under construction in Japan. The LPNHE group is responsible for an important technical contribution within the HK experiment which is the clock distribution and time synchronization system.

The new CNRS CR researcher will explore new data from the upgraded ND280 at J-PARC and will lead the analyses of the T2K-II data, with the goal of reducing the systematic uncertainties in the on-going and future long-baseline experiments.

In addition, the full participation in the HK project will require to enlarge the group experience to the Cherenkov ring reconstruction in the far detector and its application to the study of solar, atmospheric and supernovae neutrinos. The new group member will play a leading role also in this longer-term activity.

## 2) Budget request for T2K-upgrade in 2026

We would need about **10 kEuros** for maintenance of the upgraded ND280. About **70 kEuros** would be required for scientific trips to participate in the data-taking at J-PARC.

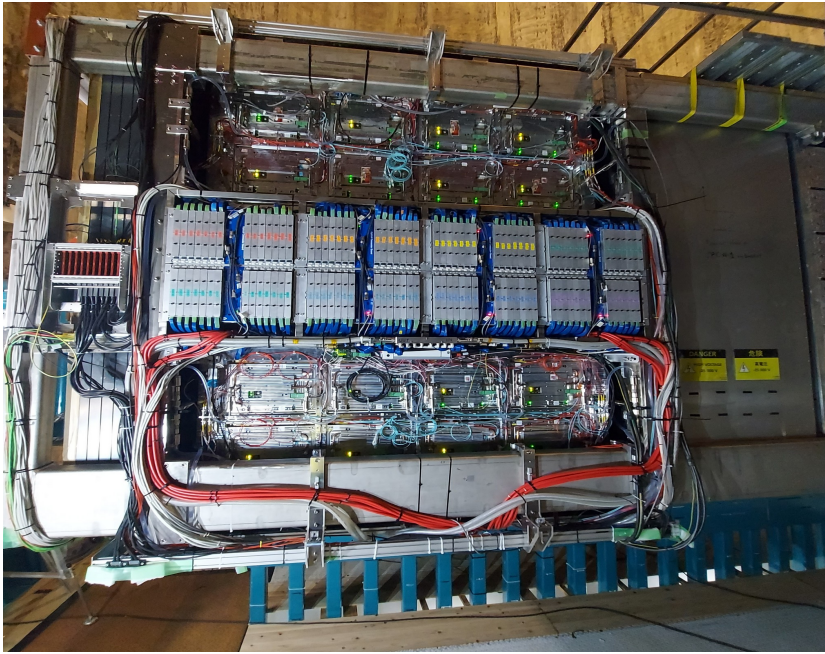
## 3) Budget request for Hyper-Kamiokande in 2026

For the HK timing system we would need about **100 kEuros** for equipment. About **80 kEuros** would be required for scientific trips to participate in the HK collaboration meetings and activities on-site as well as in the HK electronics assembly project at CERN.

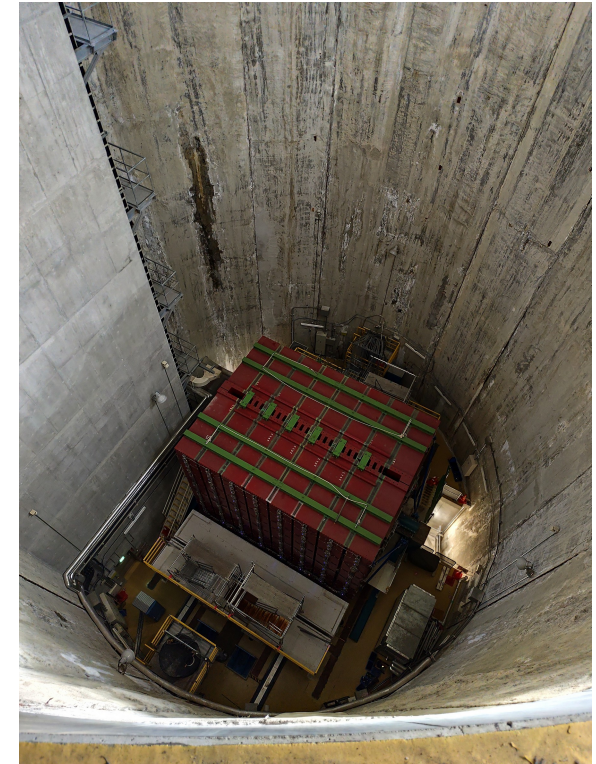
We will also ask for a **CNRS PhD grant** starting from September,2026 for T2K-II/HK to prepare ND280-upgrade measurements for use in HK analysis.

# T2K: faits marquants 2024

Successful T2K data-taking with the upgraded off-axis near detector ND280



Confirmed good performance of the new HA-TPC (paper in preparation)

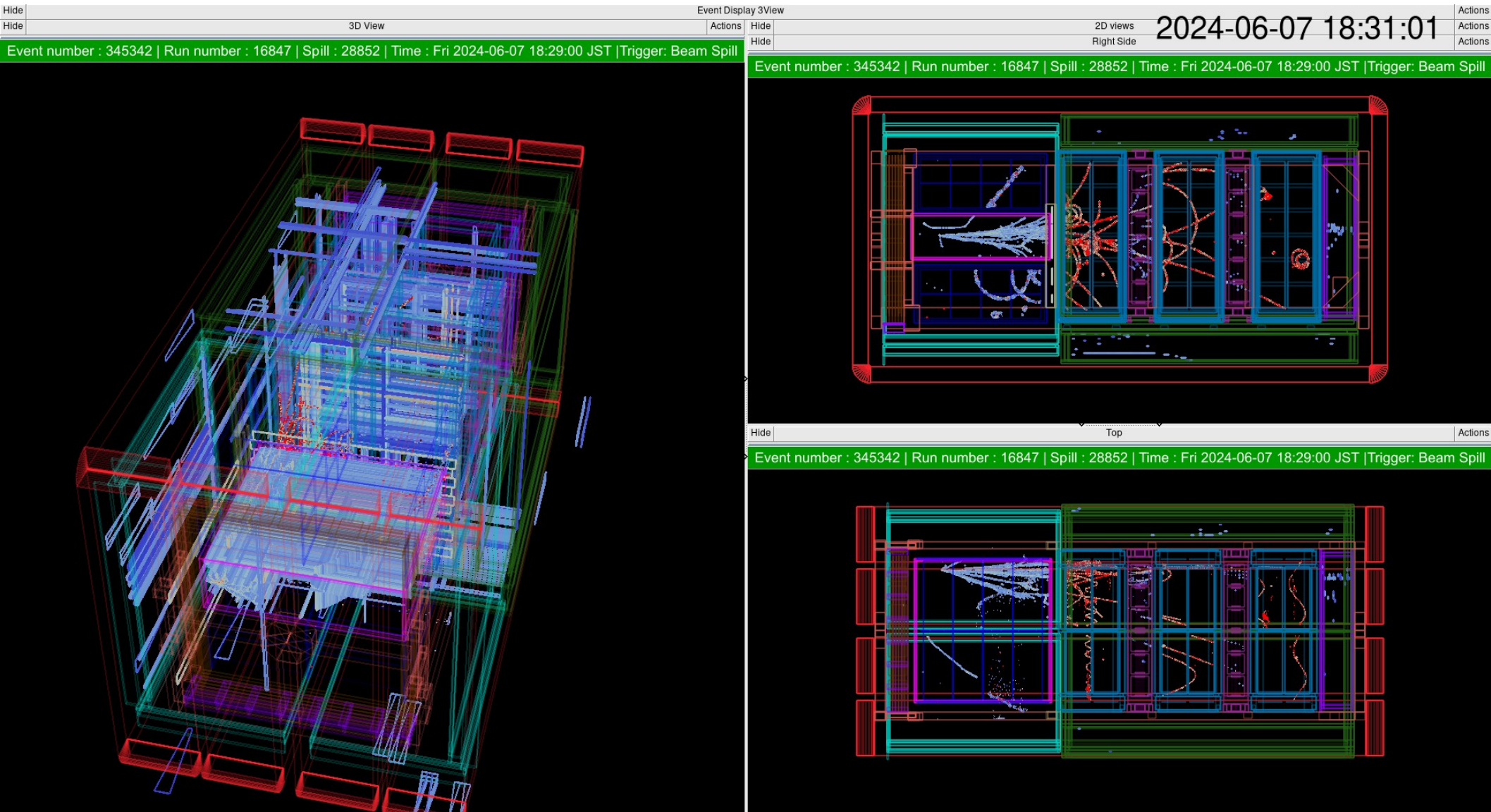


Formation of a new generation of young detector experts



# T2K: faits marquants 2024

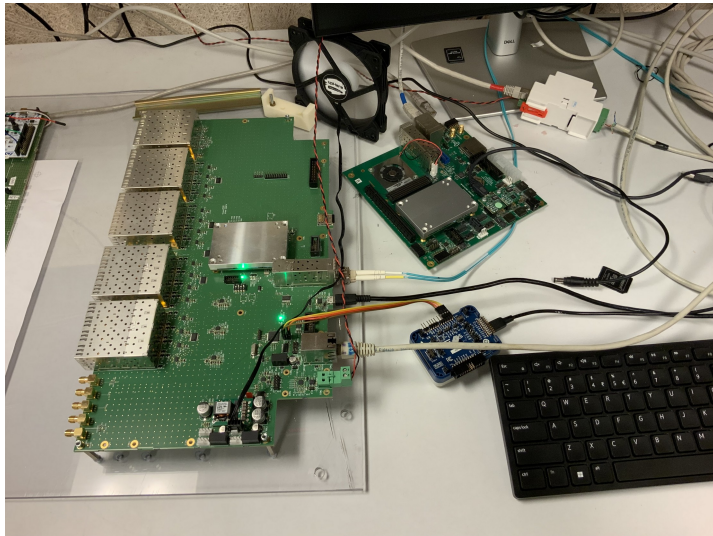
Impressive neutrino interaction in the upgraded ND280 (June 2024 run)



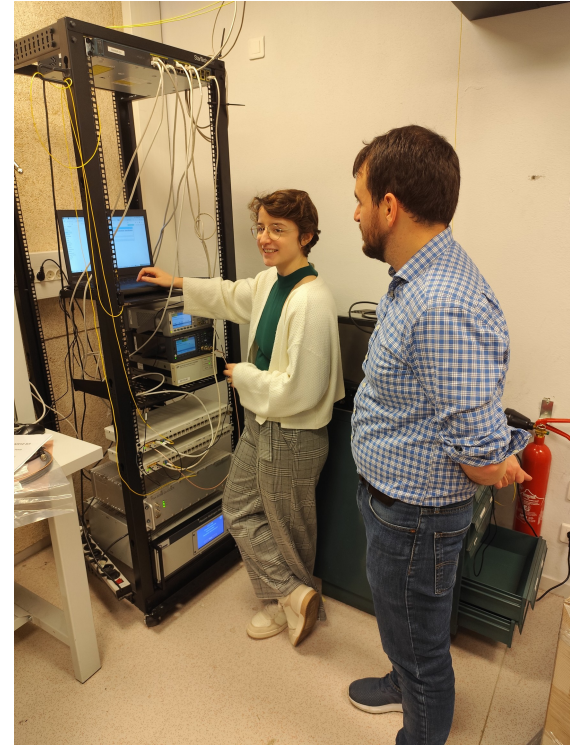
# HK: faits marquants 2024

Development of the correction algorithm for precise synchronization of a free-running Rb atomic clock with GPS Time (e-Print: 2407.20825 [physics.ins-det])

Development, production and tests of the second prototype of the Time Distribution Module



Updated HK sensitivity studies for neutrino oscillation parameters (paper in preparation)



Vertical Slice Test of the HK electronics at CERN

