



## **ILANCE Internships    Spring / Summer 2025**

University of Tokyo

<https://ilance.cnrs.fr/>

**The Franco-Japanese laboratory, dedicated to the physics of the two infinities, benefits from an exceptional scientific and cultural environment.**

An on-site laboratory in Japan, ILANCE brings together researchers, students, post-docs, engineers and technicians from CNRS and Japanese institutions. The laboratory is made up of French scientists for long-term stays in Japan and Japanese physicists. Individual research grants are awarded for postdoctoral stays or doctoral thesis. The laboratory will also aim to welcome and support French scientists for temporary stays in Japan. Based on the Kashiwa campus in the northeast of the city of Tokyo, the ILANCE laboratory permanently hosts scientists from CNRS laboratories and from four departments of the University of Tokyo namely, ICRR, Kavli IPMU, ICEPP and the School of Science.

### **Machine Learning Event Reconstruction in Neutrino Physics**

Event reconstruction algorithms are used to infer the particle properties, such as energy and direction, based on the photosensor information. Traditional likelihood-based algorithms use several approximations in the modeling of the detector that limit its accuracy and speed, which must be improved for Hyper-K. Several algorithms (DNNs; ResNet CNN, GNN, PointNet, UNet) have been adapted to our particular data format and need to be applied to real physics data. Two positions are available for this project:

- a) application to CERN particle beam data in the Water Cherenkov Test Experiment,
- b) application to Super-K cosmic ray and atmospheric neutrino data.

**Michel Gonin** [michel.gonin@polytechnique.edu](mailto:michel.gonin@polytechnique.edu)

**ILANCE Director**

[https://fr.wikipedia.org/wiki/Michel\\_Gonin](https://fr.wikipedia.org/wiki/Michel_Gonin)