



ILANCE Internships Spring / Summer 2024

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.

Data Analysis in the Super-Kamiokande Neutrino Experiment

Since their discovery in 1998 (Nobel Prize) we have learnt a lot about the parameters that govern neutrino oscillations, but there are still many questions remaining. Perhaps the most exciting of these is to determine whether neutrino oscillations violate charge-parity symmetry (CPV), and so could potentially explain why we live in a matter-dominated universe. This project involves the analysis of a unique set of photographs captured by a drone underwater in Super-K. Machine learning image segmentation techniques will be explored to accurately identify photosensors in each photo. Then using the photogrammetry technique, the geometry of Super-K can be measured for the first time after being filled with water. The result will be used by physics analysis through the detector Monte Carlo simulation.

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ILANCE

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