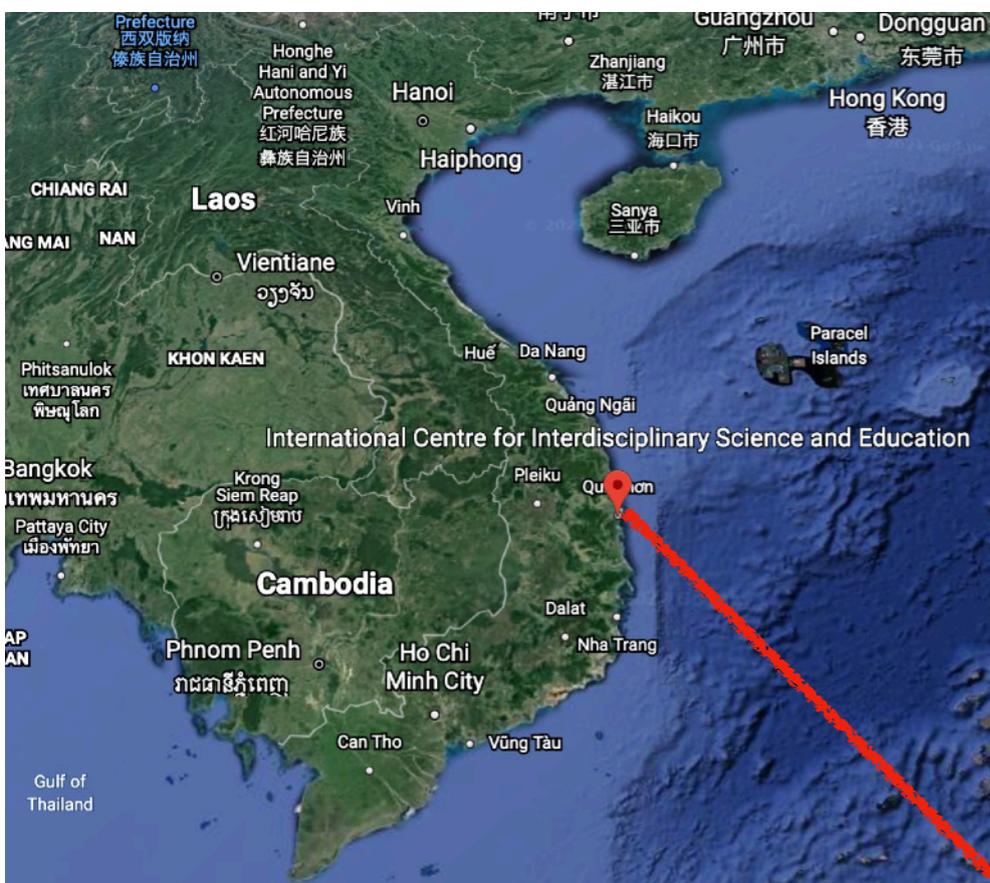


Neutrino Group IFIRSE, ICISE



<http://ifirse.icise.vn/nugroup/>



Google Earth: <https://bit.ly/3sUkBsM>

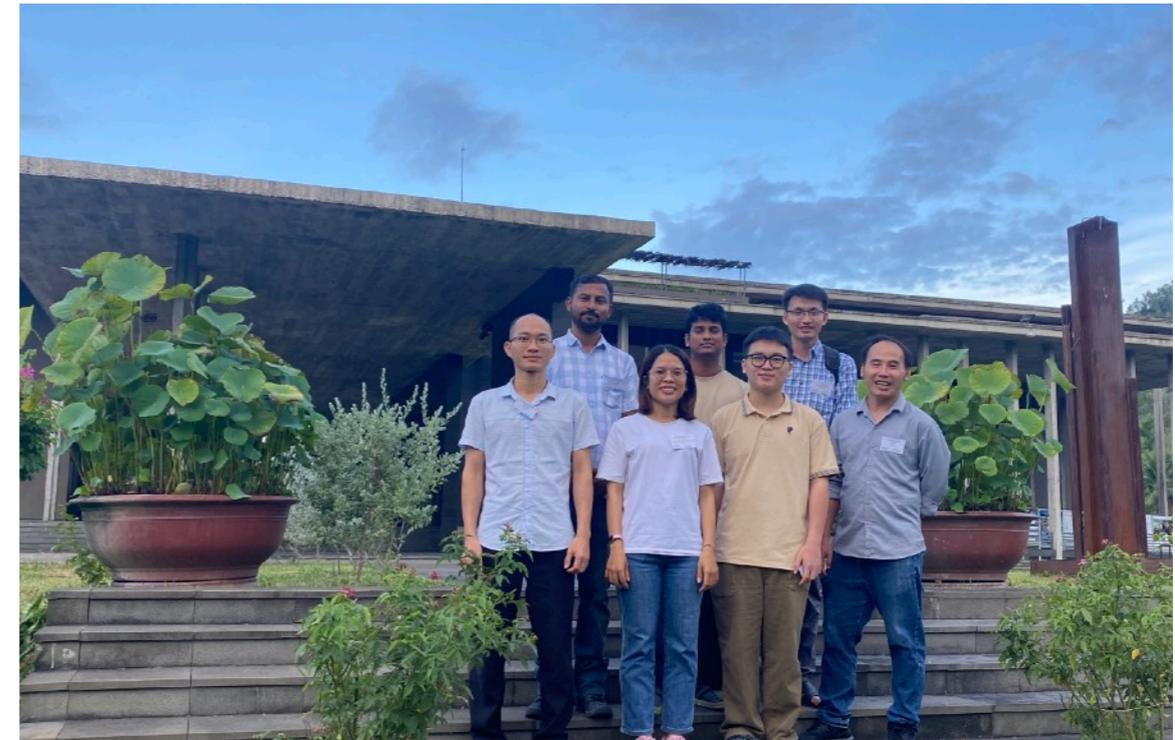
A science and education urban area is emerging



Quy Hoa Scientific and Educational Urban Area

Who are we?

July 2017



Core group members of Japan side

- **T.Nakaya (Kyoto Univ.): scientific group leader**
- Atsumu Suzuki (Kobe Univ.)
- Yuichi Oyama (KEK)
- Makoto Miura (Kamioka, ICRR, Tokyo)
- Jennifer Thomas (UCL, UK)

International Advisory Committee

- M. Nakahata (Kamioka, ICRR, Tokyo, JP)
- T. Kobayashi (KEK, JP)
- Karol Lang (The Univ. of Texas at Austin, USA)
- Jacques Dumarchez (LPNHE- Univ. of Paris, FR)

- **Dr. Son Cao (IFIRSE)**
- **M.Sc. Quyen Phan (IFIRSE, 3rd-yr. Ph.D student)**
- **M.Sc. Sang Truong (IFIRSE)**
- Other affiliated members
 - **Dr. Ngoc Tran (Kyoto Univ.)**
 - **Asso. Prof. Van Nguyen (IOP, VAST)**
 - **M.Sc. Thanh Nguyen (Dubna)**
 - **Dr. Ankur Nath (Tezpur Univ., India)**
 - **Dr. Nam Tran (Boston Univ., US, g-2 exp.)**
 - **Dr. Truong Nguyen (FPT, Danang.)**
 - **Ph.D student Shouvik Mondal (Utah Univ.); Edwin Somy (IIT Kharagpur)**

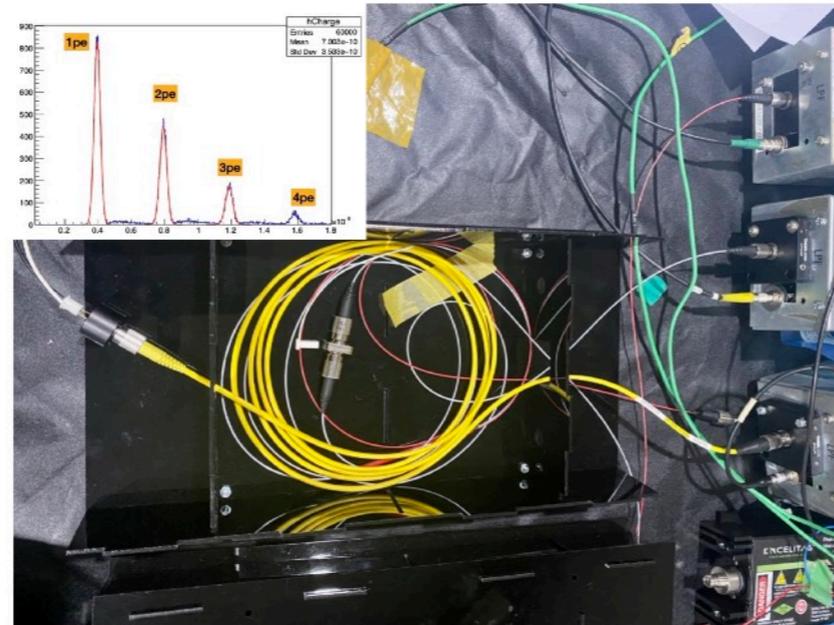
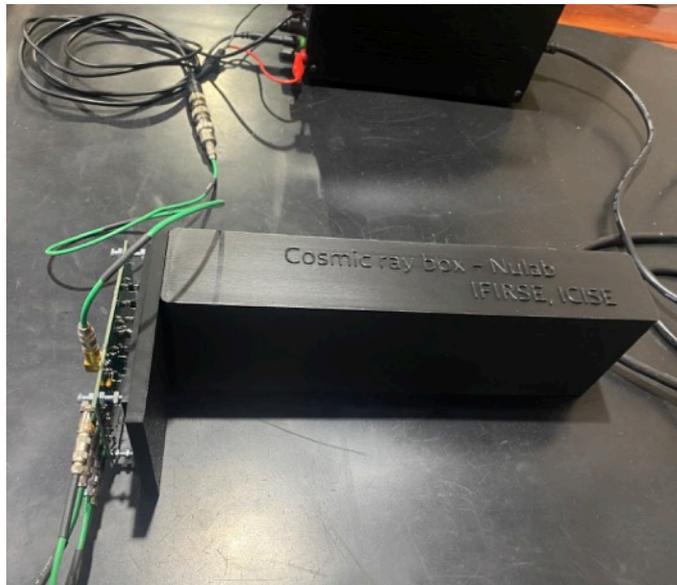
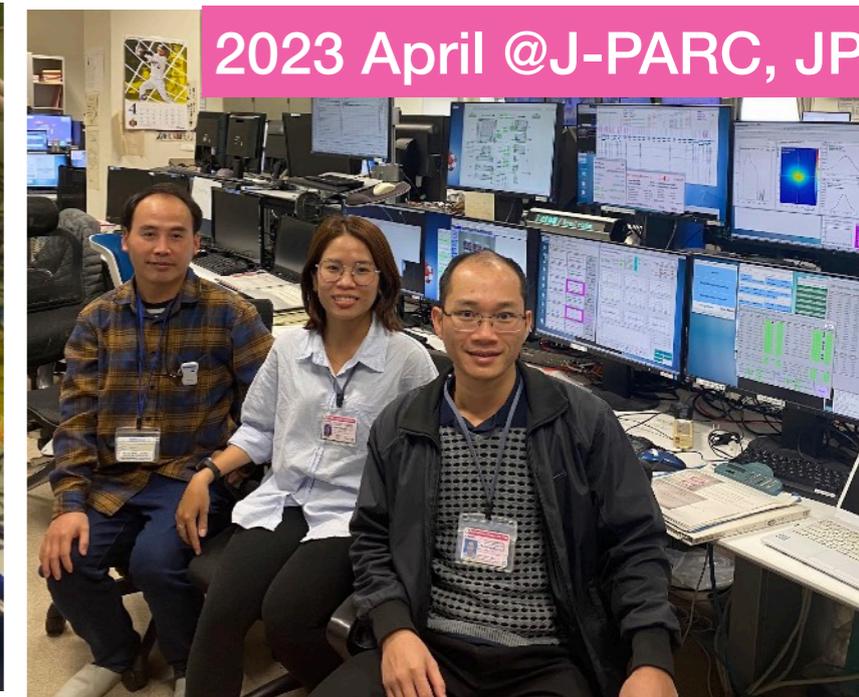
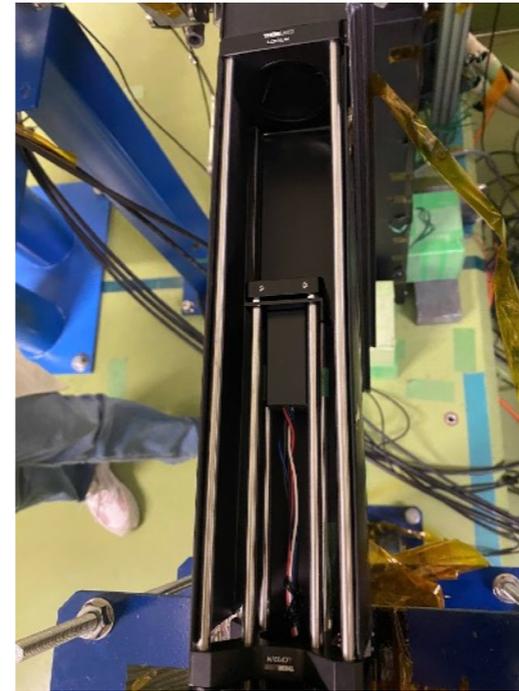
NEUTRINO is our 

**Hopefully you can understand why we love
NEUTRINO from this school!**

What are we doing?

Work as an international collaboration

- **T2K** (Oc. 2017~) an international accelerator-based long-baseline neutrino experiment in Japan (~500 collaborators from 65 institutes of 12 countries)
 - Neutrino Event Generator,
 - Neutrino Oscillation Analysis
 - Near detector construction and operation
 - Proton beam (profile and loss) monitors and operation
- **Super-Kamiokande** (Jun. 2021~) to search for the diffuse supernova neutrinos and proton decay



Build the lab at ICISE:

- Advance the single-photon sensitive sensor (SiPM and PMT) for particle physics, quantum computing and other application
- Develop detector prototypes with integrated electronics for the cosmic ray measurements and other applications

- Organize annually *Vietnam School on Neutrinos* (2025 is the 9th in the series) to **train and encourage students and young researchers working on neutrino physics**
- Organize annually *Hardware Camp for Fast and Low light detection* (2025 is the 4th in series) to **provide an intensive hands-on activities on using SiPM/PMT for physics and other applications**
- Host the *International Symposium on Neutrino Frontiers* (2018); *Neutrino workshop 2023*; and *Neutrino conference 2025* (next week)

Some recent group publications



Disentangling data contributions to the precision measurement of the largest leptonic mixing angle

PT Quyen, S Cao, NTH Van

Progress of Theoretical and Experimental Physics, ptaf082

2025

Precision of the leptonic mixing angle θ_{23} and its implications for the flavor models

PT Quyen, S Cao, NT Hong Van, A Nath, TV Ngoc

Physical Review D 111 (7), 073003

2024

Optimization of leptonic CP violation search using baseline configurations in neutrino oscillation experiments

A Nath, C Van Son, J Thomas, QP To

Journal of Physics: Conference Series 2919 (1), 012019

2023

Stringent constraint on CPT violation with the synergy of T2K-II, $NO\nu A$ extension, and JUNO

TV Ngoc, S Cao, NT Hong Van, PT Quyen

Physical Review D 107 (1), 016013

2022

Practical use of reactor anti-neutrinos for nuclear safeguard in Vietnam

S Cao, TV Ngoc, NT Van, PT Quyen

arXiv preprint arXiv:2209.03541

Neutrino mass spectrum: Present indication and future prospect

S Cao, NT Hong Van, TV Ngoc, PT Quyen

Symmetry 14 (1), 56

2021

Multi-pixel Photon Counter for operating the tabletop cosmic-ray detector under loosely controlled conditions

NH Thanh, NV Lan, CV Son, TV Ngoc, PT Quyen, N Khoa, NT Van

arXiv preprint arXiv:2106.08603

Physics potential of the combined sensitivity of T2K-II, $NO\nu A$ extension, and JUNO

S Cao, A Nath, TV Ngoc, NK Francis, NT Hong Van, PT Quyen

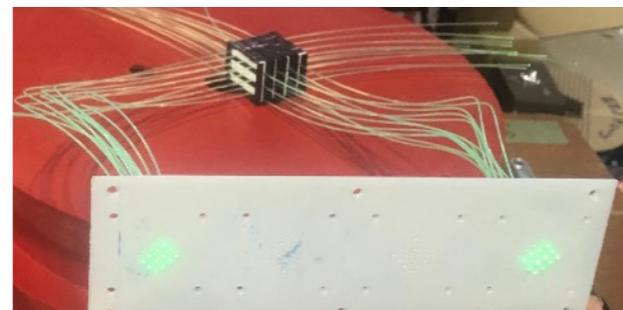
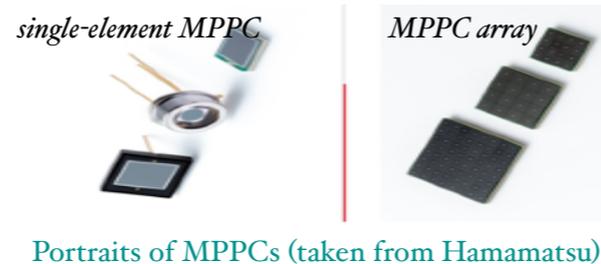
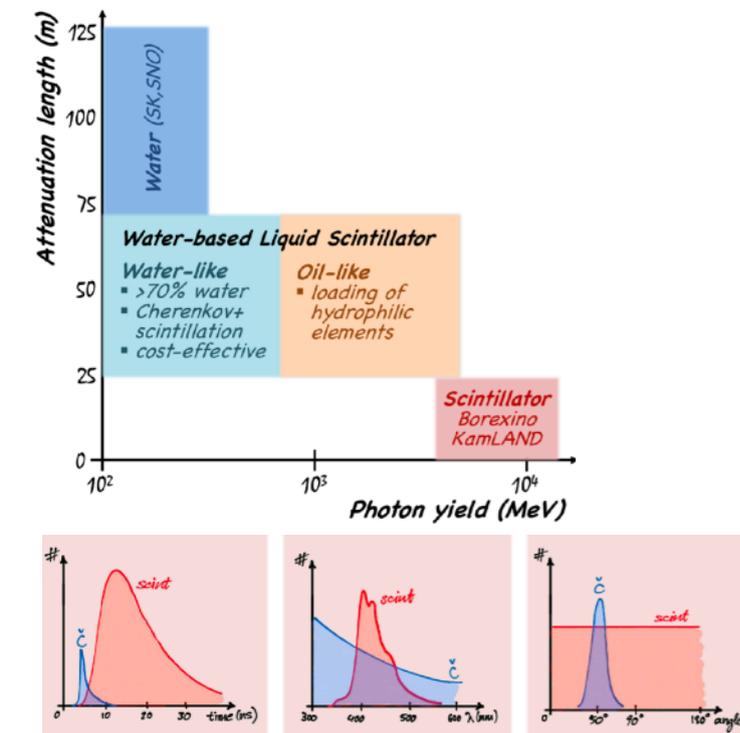
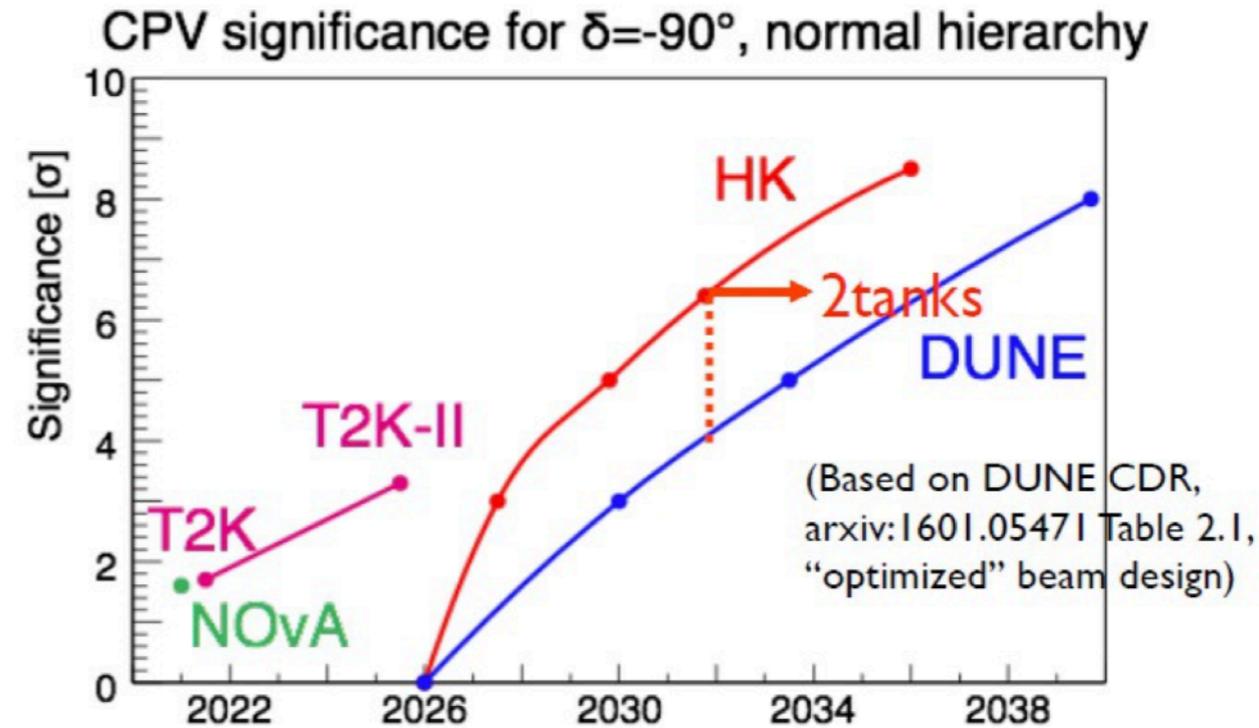
Physical Review D 103 (11), 112010

We're also interested in neutrino phenomenology, relevant mass and flavor models and its potential application

The path forward

International collaboration work

- Keep working with T2K and Super-K experiment
 - CP violation, neutrino mass ordering, and other unknown via the neutrino oscillation measurements
 - Search for diffuse supernova neutrinos and proton decay
- Aim to join Hyper-Kamiokande experiment in the near future
 - Effectively 8 times larger than Super-Kamiokande, will start operation from 2027
 - Detector installation and operation; data analysis, proton beam monitor...



Lab development

- Advance Photosensor, eg. Multi-pixel Photon Counter, (micro)PMT for physics and quantum computing
- Explore Scintillator materials, eg. Water-based Liquid scintillator
- Build Lab test bench, detector prototype

Thank you for listening!
We hope to work with you on this interesting particle.

ICISE internship

<https://ifirse.icise.vn/nugroup/internship/index.html>



2025 interns and visitors

Dr. Ngoc Tran

Kyoto Univ., JP, Jul. 02 - Jul. 26,2025

Ms. Pham Phuong Anh

USTH, Hanoi, Jun. 1 - Sep. 1,2025

Mr. Quach Khanh Duc

USTH, Hanoi, Jun. 30 - Aug. 30,2025

M.Sc. Thanh Nguyen

May 15 - July 30,2025

Dr. Navaneeth Poonthotaathil

IIT Kanpur, IN, Mar. 2-15,2025

Mr. Vo Diep Trung Tin

HUS-VNUHCM, HCM, Feb.26 - Mar. 8,2025

2024 interns and visitors

M.Sc Le Duc Truyen

National Tsing Hua Univ., TW, Oct. 17, 2024 - Jan. 17,2025

M.Sc Shouvik Mondal

University of Calcutta, IN, Oct. 16, 2023 - Jan. 14,2024

Prof. Jennifer Thomas

UCL, UK, Feb 22 - Feb 26, 2024

Ph.D student Alex Snell

UCL, UK, Feb. 22 - Mar.9, 2024

M.Sc. Sang Truong

Got M.Sc. in Nuclear Engineering at HCM Univ. of Science, Feb. 15th - Aug. 15th

Mr. Tran Quang Anh

USTH, VN, Apr. 1 - June. 30th

Mr. Edwin Somy

IIT, India, May. 20 - July 30th

Dr. Ankur Nath

Namrup college, India, July. 1 - July 30th

Dr. Chau Nguyen

Univ. of Siegen, GE, Aug. 2 - Aug. 6