

Introduction to IFIRSE Neutrino Group

Nguyen Thi Hong Van
on behalf of the group



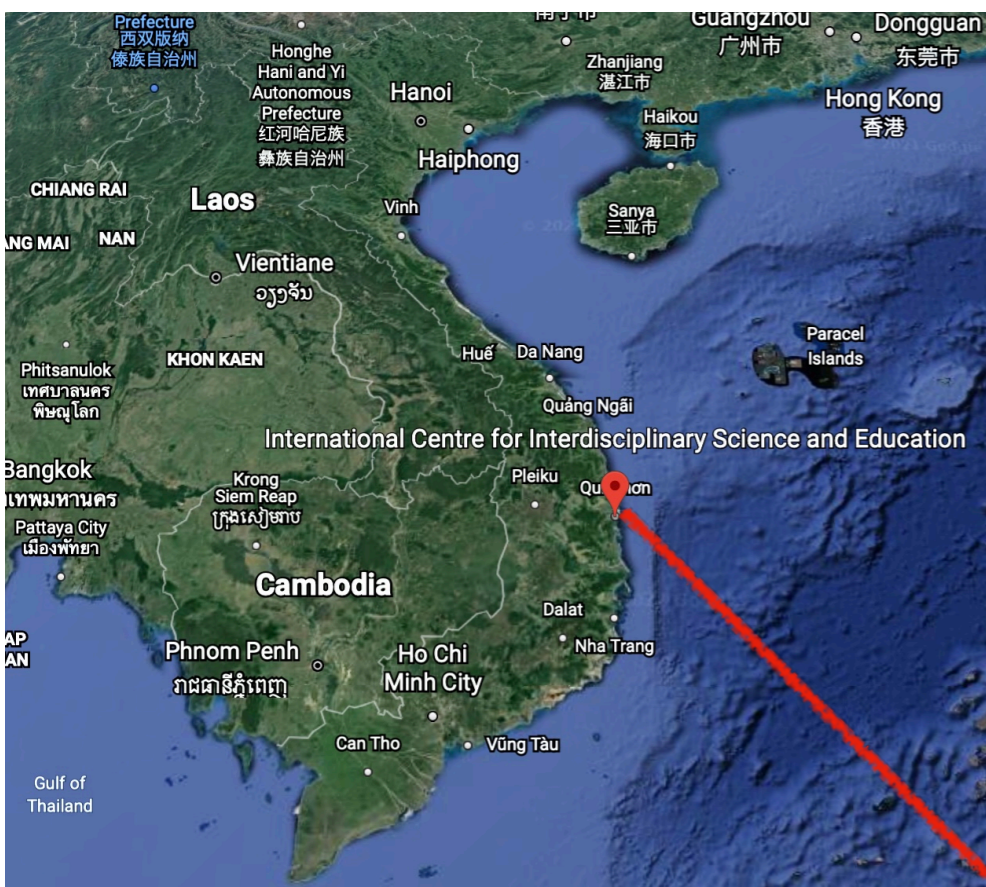
Group Formation

- Formed on July 17th, 2017 with an MoU signed between Japanese physicists and RVN
- Location: IFIRSE, Quy Nhon, Binh Dinh, Vietnam
- Organization: VN members with help from core JP physicists and an International Advisory Committee



Group webpage: <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

Group members



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)

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)
- Boris Kayser (Fermilab, USA)

- Son Cao (Group leader, IFIRSE)
- Van Nguyen (IOP, VAST & IFIRSE affiliate)
- Ngoc Tran (Ph.D student, IFIRSE)
- Thanh Nguyen (PhD student))
- Quyen Phan (IFIRSE, Pre-PhD student)
- Ankur Nath (Ph.D students, joint education, Tezpur Univ., India)
- Abinash Mehdi (Ph.D students, joint education, Tezpur Univ., India)
- ...
- Other affiliated members
 - Dr. Trung Le (Tuft Univ., US, MinervA exp.)
 - Dr. Tran Nam (Boston Univ., US, g-2 exp.)
 - Dr. Truong Nguyen (Univ. of California, Davis, US, mu2e exp.)
 - Dr. Khai Bui (Osaka Univ., JP, CANDLE exp.)
 - ...
 - ...

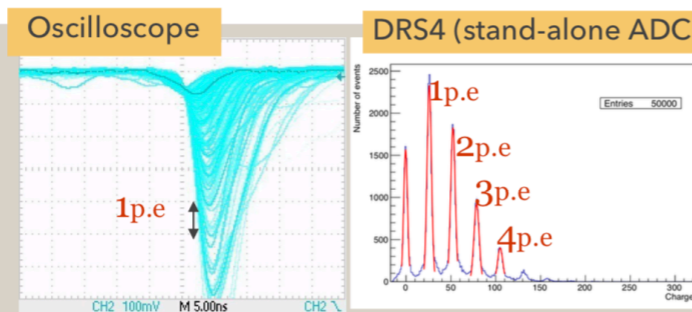
What are we doing?

Work as an international collaboration

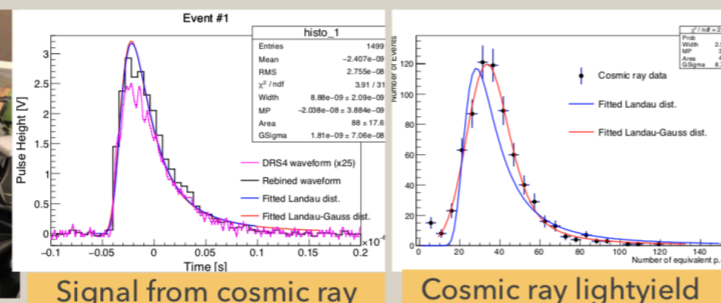
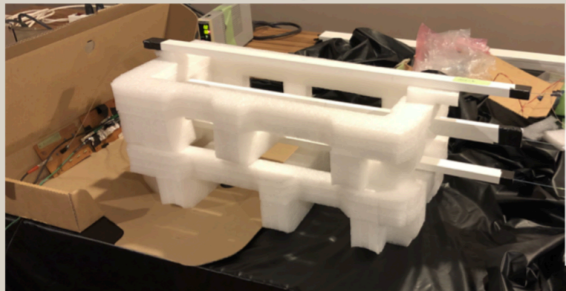
- T2K (Oc. 2017~) an international accelerator-based long-baseline neutrino experiment in Japan (~500 collaborators from 65 institutes of 12 countries)
- Neutrino Event Generator, Neutrino Oscillation Analysis
- WAGASCI (now part of T2K) (Feb. 2018~) a neutrino-nuclei interaction-focused experiment in Japan,
- Detector construction (our students are working directly with Japanese and other colleague)
- Super-Kamiokande (Jun. 2021~) to search for the diffuse supernova neutrinos and proton decay



Explore MPPC properties



Cosmic ray study



Build the lab at ICISE:

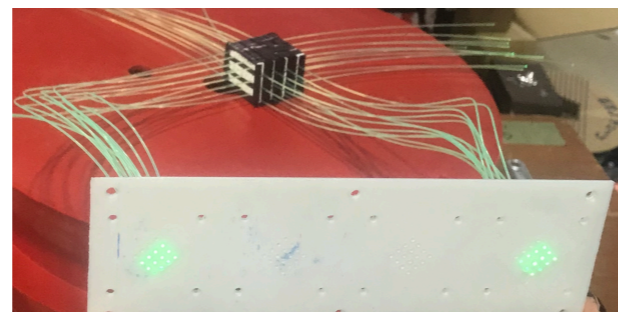
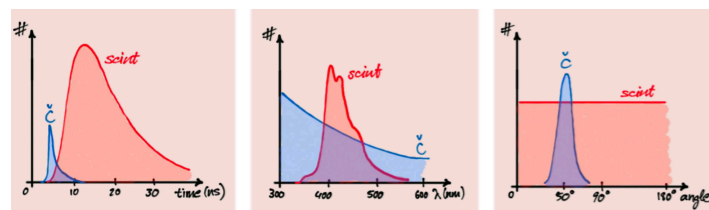
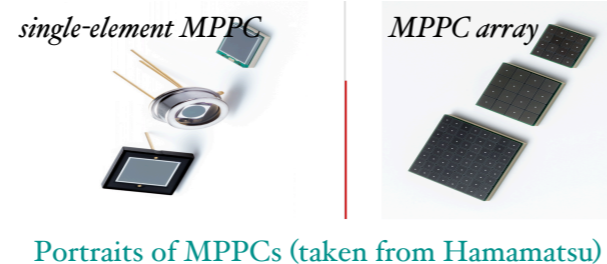
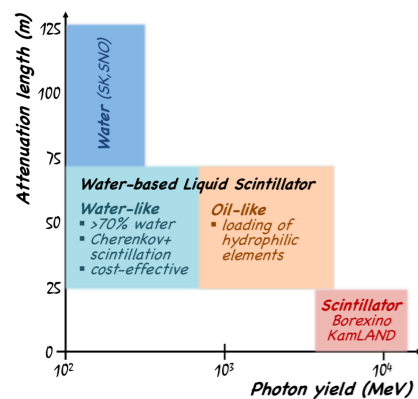
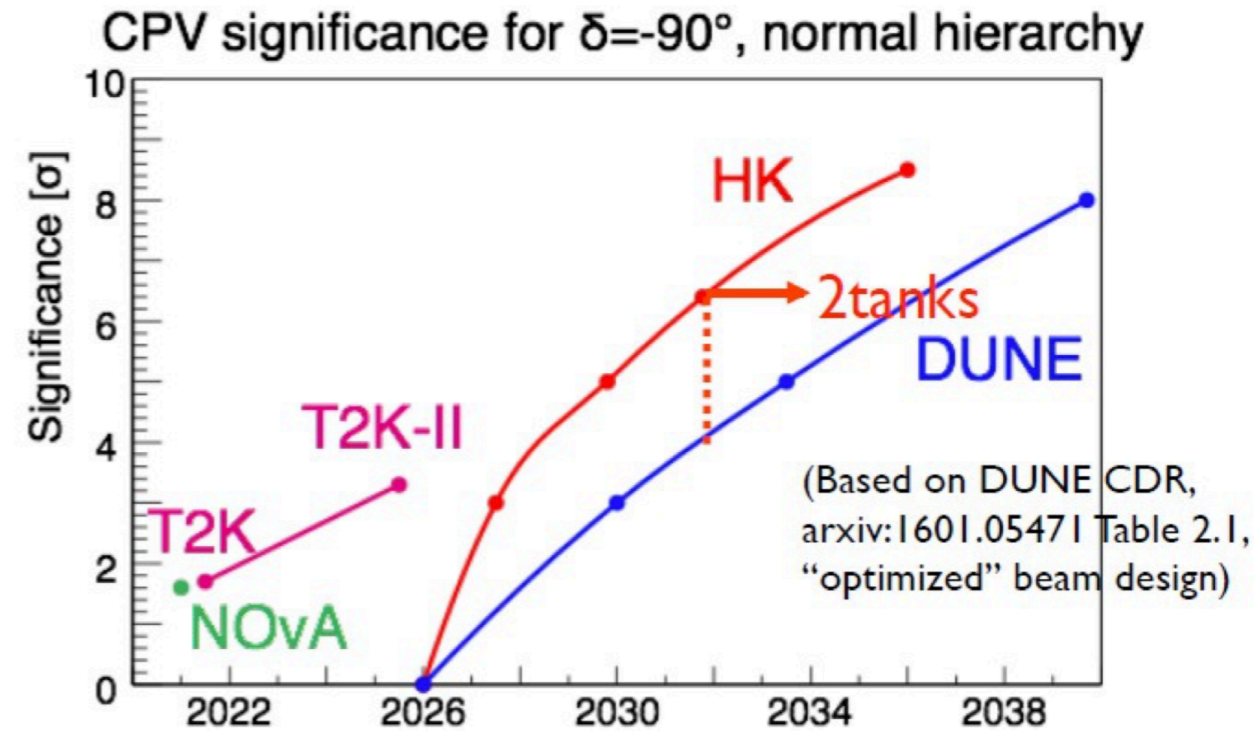
- Advance the single-photon sensitive sensor with the the plastic scintillators
- Detector prototypes for the cosmic ray measurements and other applications

- Organize annually *Vietnam School on Neutrinos (2022 is the 6th in the series)* to train and encourage students and young researchers working on neutrino physics
- Host the *International Symposium on Neutrino Frontiers (2018)*

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.
 - ✓ Along with data analysis, we may want to work on PMT or microPMT.



Lab development

- Photosensor, eg. Multi-pixel Photon Counter, (micro)PMT
- Scintillator materials, eg. Water-based Liquid scintillator
- 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>