Rencontres du Vietnam “Neutrinos”
@ICISE, July 17th, 2017

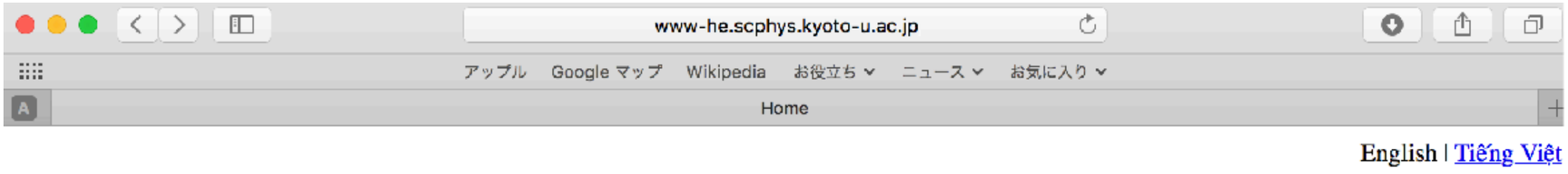
The Vietnam Neutrino group in ICISE

T. Nakaya (Kyoto Univ.)
for the VN Neutrino group

Vietnam Neutrino Group
MOU Ceremony Today [July 17, 2017]!

Neutrino Group @ ICISE

http://www-he.scphys.kyoto-u.ac.jp/member/nuICISE/



We find that this Center is also a unique place to grow an experimental high energy physics (HEP) group in Vietnam. A small group working in collaborating with T2K experiment in Japan would play a key role as a starter. Here we explain why experimental neutrino physics is our choice. In the short-term of 5 years, this group, which consists of a leader, foreign

A project of bulding a neutrino group at IFIRSE, Quy Nhon, Viet Nam

Nguyen Thi Hong Van

Institute of Physics (IOP),
Vietnam Academy of Science and Technology, Ha Noi
&
Institute for Interdisciplinary Research in Science and Education (IFIRSE), Quy Nhon

October 28, 2016

Where to build the group?

ICISE - International Center for Interdisciplinary Science and Education

- **Location**: Quy Nhon, Binh Dinh, Vietnam (20 hectares site between mountains and sea),
- **Founders**: Tran Thanh Van and Le Kim Ngoc
- **Activities**: → 10-12 high level international scientific conferences a year → welcome more than 1000 scientists over the world every year.
  → International schools on specific subjects.

Where to build the group? (2)

- **IFIRSE**, beside ICISE, is created to promote scientific research and education in Quy Nhon and Vietnam.
- IFIRSE is surposed to become an Institute of high level with an international environment and collaboration.
- Director: Tran Thanh Van

IFIRSE - Institute For Interdisciplinary Research in Science and Education

Theoretical Physics Group

- Le Duc Ninh (*got PhD in France, spent postdoc in Germany*)
- Dao Thi Nhung (*got PhD in Germany, spent postdoc in Germany*)
- more people are welcome

Experimental Physics Group

- Tsuyoshi Nakaya (*Prof. at Kyoto univ., Japan*)
- Cao Van Son (*got PhD in US, postdoc at Kyoto univ. & KEK, Japan*)
- N. T. Hong Van (*got PhD in France, working at IOP*)

Neutrino Group @ ICISE

Introduction to the ICISE center and IFIRSE Institute

(From Jean Tran Thanh Van, Director of IFIRSE):

With the 50 years of experience of the Rencontres de Moriond, the ICISE center has been built with the aim of promoting scientific exchanges between Western scientists and Asian and particularly Vietnamese scientists. It is an independent non governmental organisation (NGO). It is entirely funded by personal contributions of scientists mainly from the HEP and Astrophysics communities.

Help to the active participation of our friends scientists from all over the words, the scientific program of ICISE is now in a good shape. It is why we can now try to contribute to the development of scientific research in this part of Vietnam. An Institute for Research (IFIRSE) has been created to promote research in Quy Nhon. The project is as follows :

- The first step is the creation of a theoretical physics group which is officially launched on October 1st 2016 with two permanent members : Le Duc Ninh and Dao Thi Nhung who are now working in Quy Nhon.
- The second step will be the creation of an experimental neutrino group with Cao Son (who is in KEK) and Nguyen Hong Van (from IOP, Hanoi)

For more information, please visit http://www.icisequynhon.com

Neutrino Group @ ICISE

Leader: Prof. **Tsuyoshi Nakaya** (Kyoto Univ.), Professor of physics

T2K Spokesperson

The chair of Hyper-K steering committee

Assistant Group:

- Prof. Yuichi Oyama From KEK
- Prof. Makoto Miura From ICRR
- Prof. Atsumu Suzuki from Kobe University.

Group Member:

- Dr. Van Nguyen, IFIRST, Quy Nhon & Institute of Physics, Hanoi, Vietnam
- Dr. Son Cao, (affiliated), IPNS, KEK, Japan
- Dr. Trung Le, (affiliated), Tufts Univ., USA

Students: N/A

International Advisory Committee:

- **Takashi Kobayashi** (KEK), Professor of physics,
  Deputy director of Institute of particle and nuclear studies, KEK
  Head of Particle and Nuclear Physics division, J-PARC
- **Masayuki Nakahata** (Kamioka, ICRR), Professor of physics,
  the directory of Kamioka observatory, ICRR
  the spokesperson of Super-K
- **Karol Lang** (The Univ. of Texas at Austin), Professor of Physics
  Co-Spokesperson of MINOS+
- **Jacques Dumarchez** (LPNHE-University of Paris), CNRS research director
  former President of the French CNRS-IN2P3 Scientific Committee
- **Boris Kayser** Professor of physics at Fermilab, USA

Neutrino Group @ ICISE

International Advisory Group

- Takashi Kobayashi (KEK)
- Masayuki Nakahata (ICRR, U. of Tokyo)
- Karol Lang (U. of Texas at Austin)
- Jacques Dumarchez (LPNHE- U. of Paris)
- Boris Kayser (Fermilab)

Leader: Tsuyoshi Nakaya (Kyoto Univ.)

Core Group Members

- **Van Nguyen (IFIRST, IOP)**
- **Son Cao (KEK, KEK)**
- **Trung Le (Tufts, USA)**
- **w/ Ph.D students in the future**

Assistant Group Members

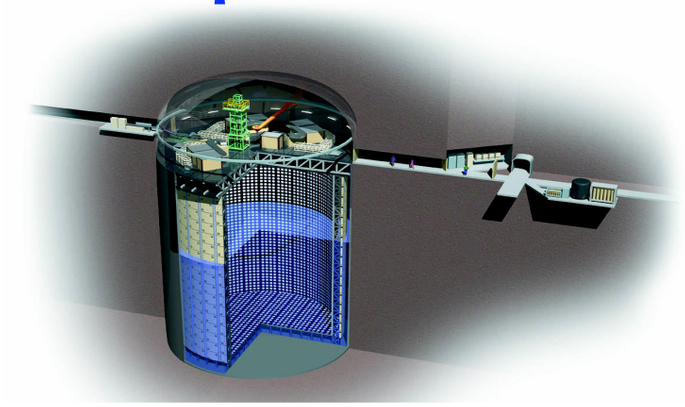
- Yuichi Oyama (KEK)
- Makoto Miura (ICRR, U. of Tokyo)
- Atsumu Suzuki (Kobe Univ.)
- w/ more KEK/ICRR/University staff members (exam. Y. Hayato, etc..

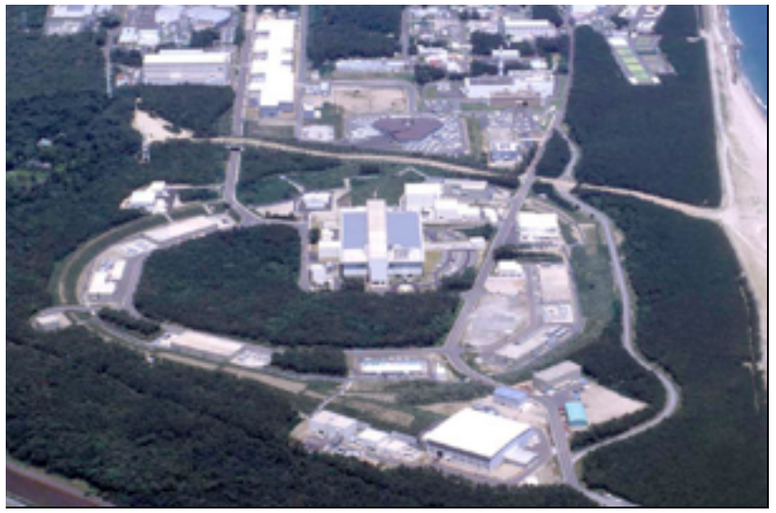
- ***Will join the Super-K, T2K and Hyper-K experiments***

Neutrino oscillation experiments in Japan

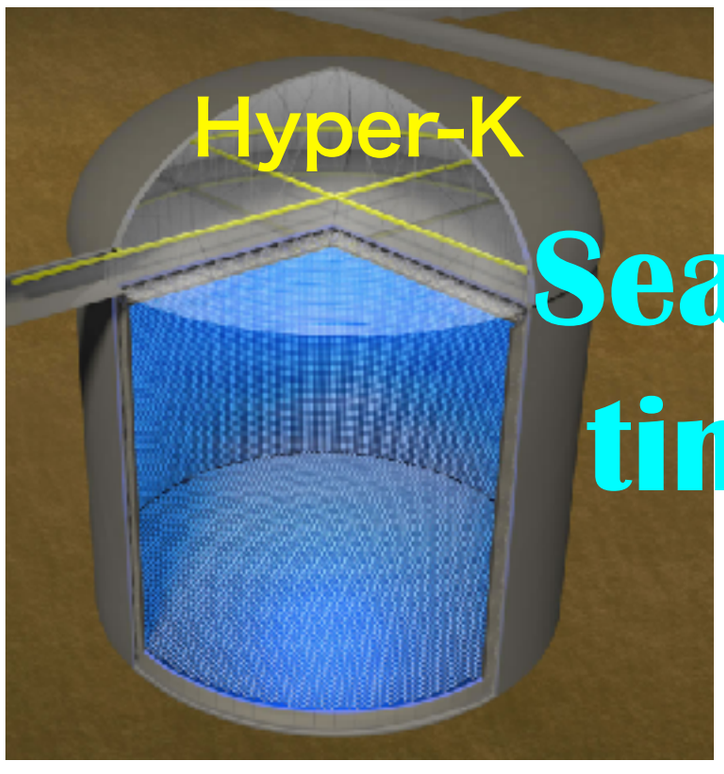
Intense Neutrino Beam for $\overset{(-)}{\nu}_\mu \rightarrow \overset{(-)}{\nu}_e$ study

Super-K

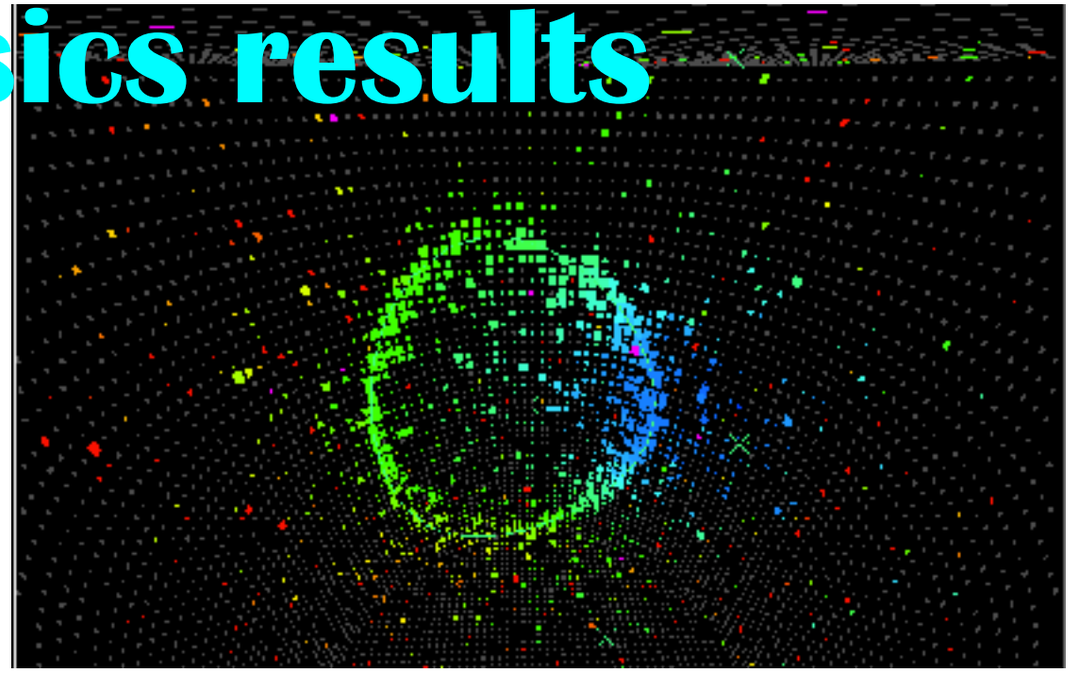




- 430 kW (today)
- ~1MW (2020)
- 1.3 MW (2025)



Seamless program with timely physics results



- 22.5 kton (Super-K, ~2026)
- 190 kton (Hyper-K, 2026~)

Activities in 2016-2017

- Dr. Van Nguyen attended the Super-K and T2K meetings.
  - She works for the development of neutrino interaction program, “NEUT”.
- We are organizing the VIETNAM SCHOOL ON NEUTRINOS (VSoN) under the leadership of Prof. Yuichi Oyama (KEK).
  - Educate the talented Vietnamese (and Asian) students for the Ph.D. program.
  - Bring the hardware test setup in Vietnam donated by KEK.
- Dr. Son Cao is the core T2K member for the neutrino beam line (and the convener of the T2K INGRID detector).

Future Activities

- With Ph.D. students, we will start the physics analysis.
  - In T2K, the neutrino oscillations with
    - Beam monitor equipments (with Prof. Y. Oyama and Dr. Son Cao)
    - Neutrino Cross Section measurements together with the J-PARC neutrino test experiments (NINJA, WAGASCI, etc..)
    - Developments of the neutrino interaction simulation (with Dr. Van Nguyen)
  - In Super-Kamiokande, we work for
    - Atmospheric Neutrinos and proton Decays (with Prof. M. Miura)
    - Super-Nova Neutrinos
    - Super-Kamiokande Detector Upgrade (SK-Gd)
    - Detector calibrations
- In Hyper-Kamiokande
  - Physics study (with Prof. A. Suzuki)
  - Photon-sensor developments

Let's advance Neutrino Physics!

- The Vietnam Neutrino Group is officially born today under MOU between the Japanese group and the Vietnam group.
- We are all friends to work together.
- Your kind supports on the new Vietnam Neutrino Group are really appreciated.

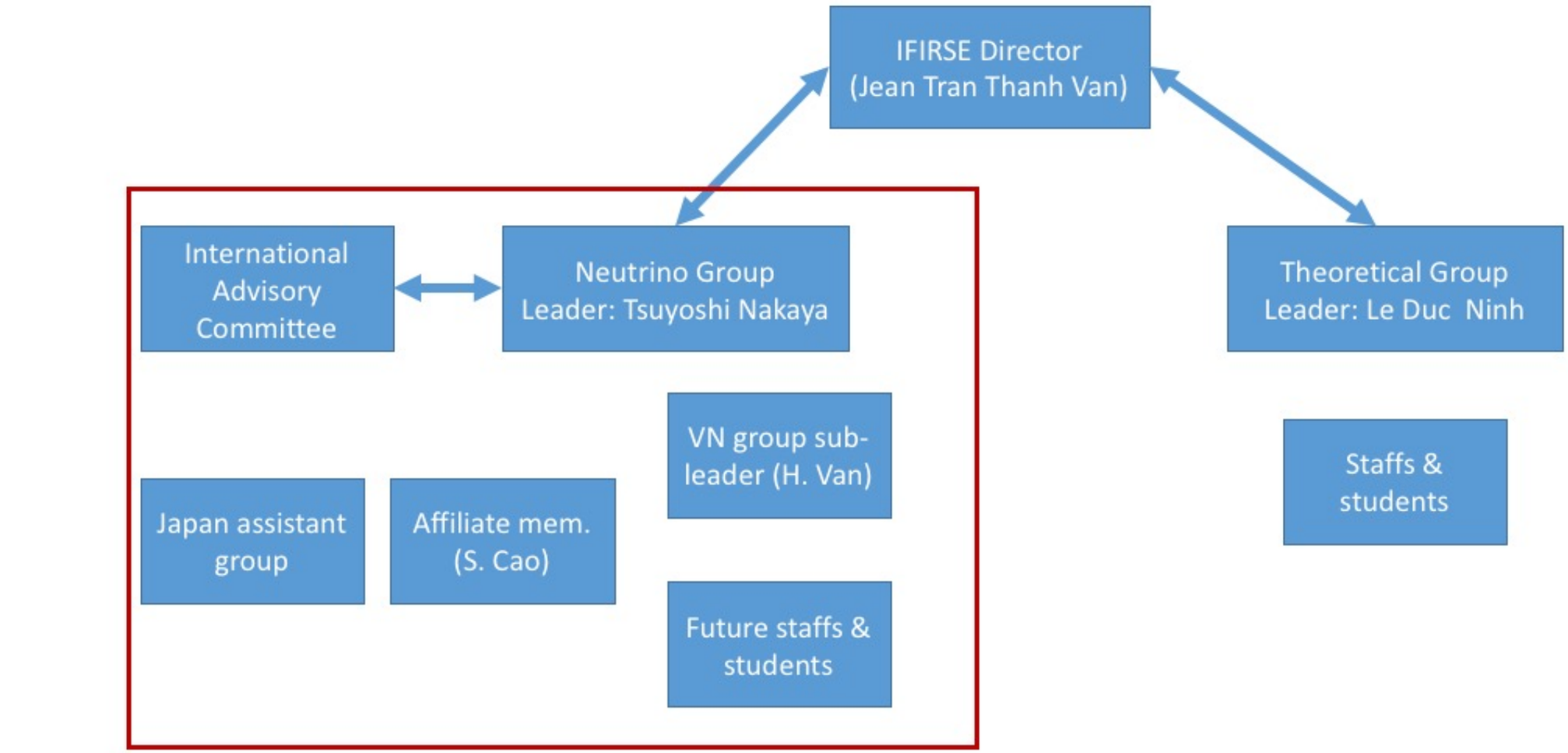
Backup


A project of bulding a neutrino group
at IFIRSE, Quy Nhon, Viet Nam
Nguyen Thi Hong Van
Institute of Physics (IOP),
Vietnam Academy of Science and Technology, Ha Noi
&
Institute for Interdisciplinary Research in Science and Education
(IFIRSE), Quy Nhon
October 28, 2016
Nguyen Thi Hong Van
A project of bulding a neutrino group at IFIRSE, Quy Nhon, Viet Nam

Current research on experimental neutrino physics

- Joint IFIRSE Neutrino Group as one of core members from Vietnam side
- Plan to work for T2K, Super-K and Hyper-K experiments

IFIRSE - Institute For Interdisciplinary Research in Science and Education



IFIRSE neutrino group: Activities and schedule

Neutrino summer school (9-21 July, 2017)

- Lecturers:
  - B. Kayser (Fermilab, USA)
  - Y. Oyama (IPNS, KEK, JP)
  - M. Miura (ICRR, Tokyo Univ., JP);
  - A. Suzuki (Kobe Univ., JP)
  - F. Vannucci (LPNHE, France)
  - K. Lang (UTexas at Austin, USA)
  - N. Anh Ky (IOP, Hanoi, VN)
- Students:
  - Vietnam (10-12 students)
  - Japan (3 students + 1 TA)
  - Other countries (3 students)

IFIRSE neutrino group: Activities and schedule

Schedule:

- Pilot period (2-3 months, summer 2017)
  - The whole group will work in a specific subject as starting under the supervision of Japanese core members.

- Short-term period (3-5 years, fall 2017-2023)
  - Select 1-2 PhD students.
  - A small group, based at IFIRSE, with a leader (may work remotely), 2 VN core members and 1-2 PhD students is established to join officially, as data/MC analyzers, in an international collaboration (e.g T2K, Super-K).
  - Find 1-2 foreigner postdocs to extend the group.

- Long-term period (from 2023)
  - Enlarge group (can be earlier if get more support)
  - Keep join in collaboration and extend, may be, to Hyper-K
  - May build a R& D lab (this will need more postdocs).
  - etc.