# Japan-based programs in 3'

A.K.Ichikawa

http://www.jahep.org/files/20170906-en.pdf

# Final report of the committee on Future Projects in High Energy Physics

Masaki Ishitsuka, Hirokazu Ishino, Masaya Ishino, Wataru Ootani,
Takashi Obina, Masaaki Kitaguchi, Ryuichiro Kitano, Hiroshi Sakai,
Tomoyuki Sanuki, Nanae Taniguchi, Makoto Tomoto,
Takeshi Nakadaira, Hajime Nanjo, Takeo Higuchi, Shigeki Matsumoto,
Shigetaka Moriyama, Tamaki Yoshioka

06 September 2017

- With the discovery of the 125 GeV Higgs boson at the LHC, **construction of the International Linear Collider (ILC) with a collision energy of 250 GeV should start in Japan immediately** without delay so as to guide the pursuit of particle physics beyond the Standard Model through detailed research of the Higgs particle. In parallel, continuing studies of new physics should be pursued using the LHC and its upgrades.

- Three-generation neutrino mixing has been established and has provided a path to study CP symmetry in the lepton sector. Therefore, **Japan should promote the early realization of Hyper-Kamiokande as an international project** due to its superior proton decay sensitivity, and should continue to search for CP violation with the T2K experiment and upgrades of the J-PARC neutrino beam.

The High Energy Committee should pursue all available options to achieve the early realization of these key, large-scale projects.

It is important to complete construction of SuperKEKB and start physics studies as scheduled. Some of the medium- and small-scale projects currently under consideration have implicit potential to develop into important research fields in the future, as happened with neutrino physics. They should be promoted in parallel in order to pursue new physics from various directions. Flavor physics experiments, such as muon experiments at J-PARC, searches for dark matter and neutrinoless double beta decay, observations of CMB B-mode polarization and dark energy, are considered to be projects that have such potential.

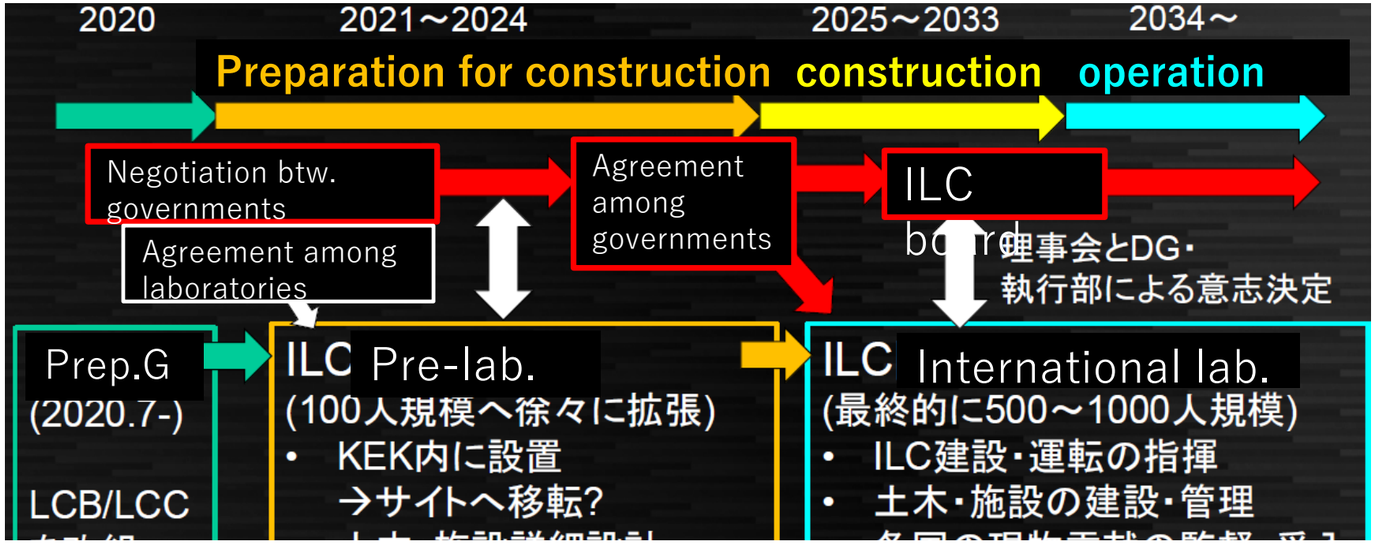
- KOTO($K_L \to \pi^0 \nu\bar{\nu}$)is running
  Conducting study of charged Kaon background
- MEG II ($\mu \to e\gamma$)@ PSI will start in 2020
- COMMET phase1 ($\mu \to e$) is aiming to start in ~2022
- g-2/EDM is aiming to start construction in 2021
- CMB (LiteBIRD, GroundBIRD in preparation)
- $0\nu\beta\beta$ (KamLAND-Zen 800 is running)

# ILC

w/ 250 GeV center of mass energy

- precision measurement of the Higgs
- Precision measurement of electroweak physics
- searching for dark matter candidate particles

***Notional timeline***




**ICFA Statement on the ILC Project**

24 February 2020

- encouraged by the reports from Deputy-Director General, MEXT Research Promotion Bureau and Chairperson of the Federation of Diet Members for the ILC

…

- anticipates that these development activities could be completed in approximately one year, at which point it would be possible to launch the preparatory phase for the ILC, provided Japan expresses intent to do so together with international partners.

• encourages the interested members of the high energy physics community, laboratories, and nations, to support and participate in these preparations aimed at the successful establishment of the ILC.

# Long-baseline neutrino program

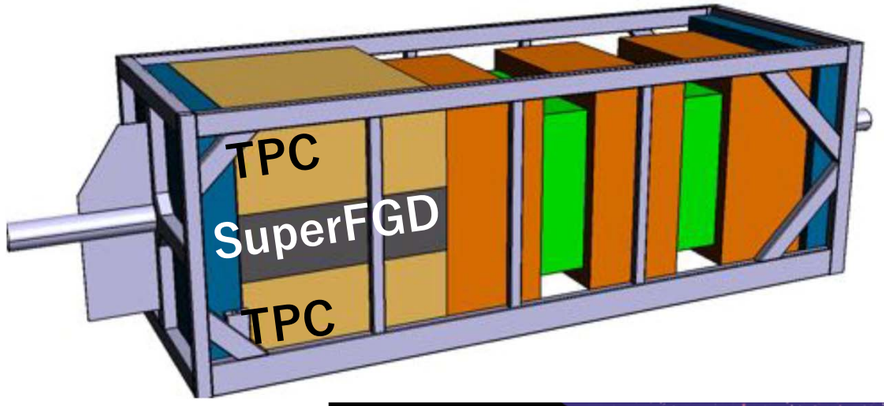
T2K (J-PARC to Super Kamiokande)

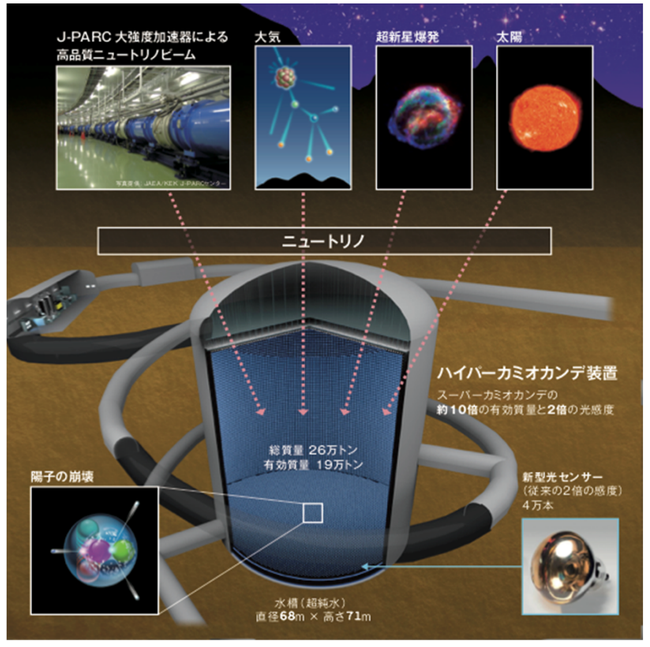
- Now, CPV @ 95% C.L.
- Accelerator upgrade in 2021
- Near detector upgrade in 2021
- Gd loading into SK in 2020

**Hyper Kamiokande project was approved by Japanese government and construction started in 2020.**

- 190 kton Water Cherenkov detector
- 1.3 MW beam from J-PARC
- Aiming to start in 2027

T2K ND280 upgrade



# SuperKEKB/Belle-II

- Aiming at KEKBx40 luminosity by nano-beam scheme
- This week, peak Luminosity exceeded that of KEKB.