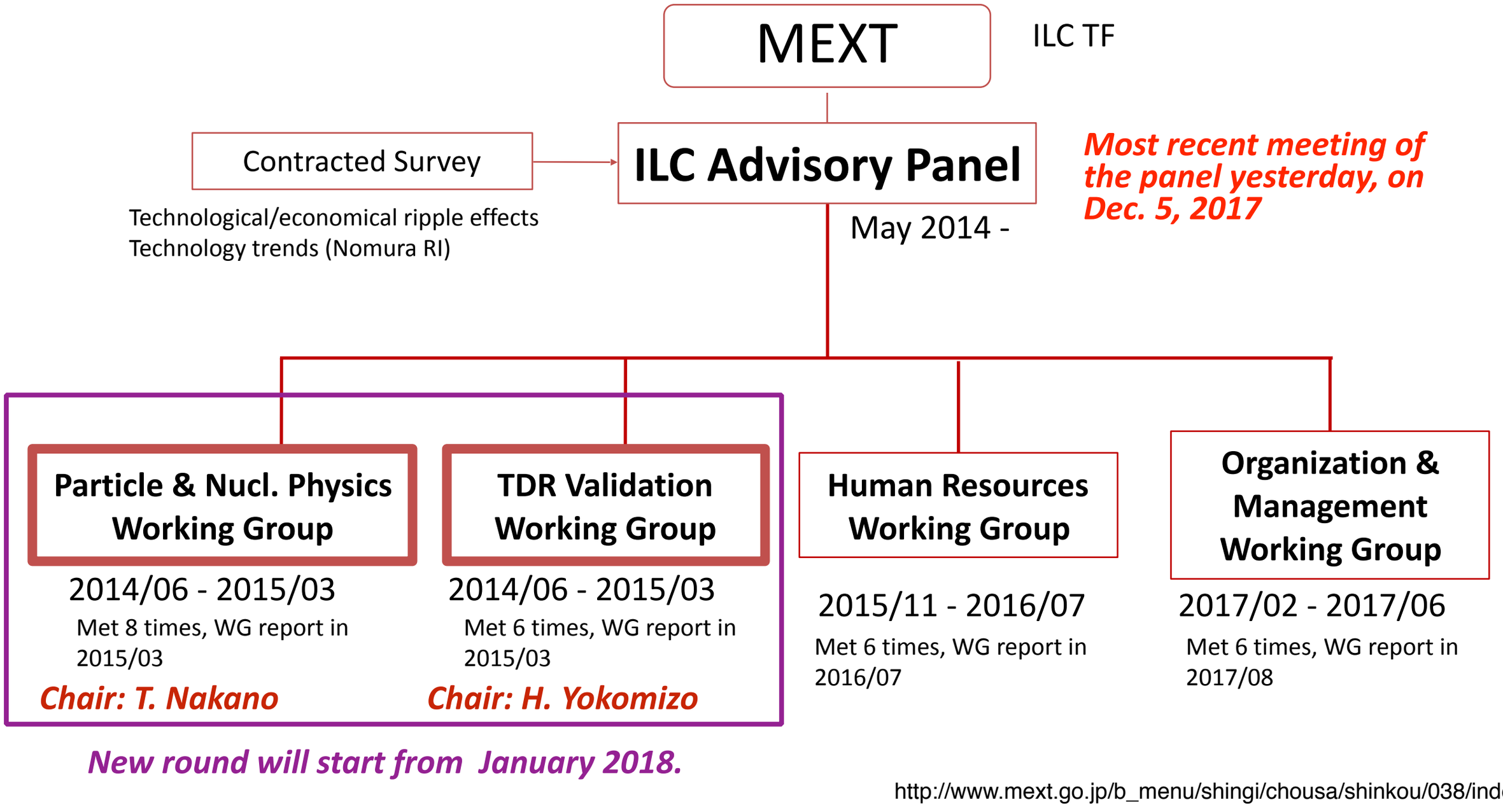
Report from Physics WG

Keisuke Fujii
on behalf of the Physics WG
January 24, 2018

MEXT Review

ILC Advisory Panel

Set up in May 2014 under MEXT ILC Task Force to investigate various issues concerning the possibility of hosting the ILC in Japan



New round will start from January 2018.

http://www.mext.go.jp/b_menu/shingi/chousa/shinkou/038/index.htm

Charge given to the physics WG

Taking into account the recommendations made in the interim report by the MEXT ILC Panel, review the 250 GeV ILC physics case and clarify potential issues if any.

Membership

Particle and Nuclear Physics WG

1. Takaaki Kajita (deputy chair) : Cosmic Ray Research
2. *Sachio Komamiya* : HEP
3. Hideyuki Sakai : Nuclear Physics
4. Seiji Tanabashi : HEP (theory)
5. Eiji Chin : Accelerator
6. *Katsuo Tokushuku* : HEP
7. Takeshi Nakano (chair) : Nuclear Physics
8. Tsuyoshi Nakaya : HEP
9. Tetsuo Hatsuta : Nuclear Physics (theory)
10. Ryugo Hayano : HEP
11. Shigeki Matsumoto : HEP (theory)
12. Taku Yamanaka : HEP
13. Hiromi Yokoyama : Scientific Communication

Members are mostly from HEP (theory/exp.), nuclear physics, and cosmic ray research

The 1st Meeting of the Particle & Nuclear Physics WG happened on

January 18, 2018

Agenda:

- ***General remark from the secretariat***
- ***ILC project status (development since the last round of the WG)***
- ***Development of LHC Experiments : K. Hanagaki***
- ***Physics Case of the 250 GeV ILC : KF***
- ***Plan for further discussions***
- ***AOB***

Main points made in Hanagaki's talk

- ***LHC Run II saw no indication of BSM physics: everything consistent with SM so far.***
- ***The most likely scenario is then scenario 3 of the interim report by the MEXT panel: no new particle found at 13 TeV LHC.***
- ***Most probably, there will be no further inputs to judge the new particle discovery potential of ILC.***
- ***ILC's performance and expected scientific outcome should be considered, assuming scenario 3.***

Main points made in KF7s talk

- ***Given the situation that LHC Run II saw no BSM signal so far, the importance of the precision Higgs measurements became further enhanced.***
- ***Recent development (EFT) made it possible it possible to measure absolute values of the Higgs couplings model-independently with 250 GeV data only.***
- ***Through the precision Higgs coupling measurements, the 250 GeV ILC will find the pattern of coupling deviations from the SM and decide the future direction of particle physics.***
- ***Based on the results at 250 GeV and adding data at higher energies, we will be able to precisely measure top quark properties and the triple Higgs coupling, thereby further narrowing down the new physics possibilities.***
- ***In this way, we will be able to pave the way to unified understanding of Nature. The 250 GeV ILC will be the first step.***

Some critical questions

- ***There are many projects proposed to discover BSM physics. Is the 250 GeV ILC worth building, stopping all of these other projects?***
- ***What discovery will bring Nobel prize to the ILC?***
- ***The ICFA statement mentions the initiative by Japan. What does it exactly mean?***

The 2nd Meeting of the Particle & Nuclear Physics WG will happen on

February 5, 2018

Physics focus schedule

Jan. 24: BSM/NP (Frank)
Jan. 31: Top/QCD (Jenny)
Feb. 7: Higgs/EW (KF)
Feb. 14: BSM/NP (Frank)
Feb. 21: Ichinoseki ILD Meeting

weekly Wednesday meetings (at least) till Ichinoseki
→ 3-week turn-around too fast for physics focus - take flexible attitude

Conveners' ML:
ild-physics-conveners@desy.de

Use this mailing list to send your talk request.