Opening Comments

2021/08/25

Keisuke Fujii

WG Objectives

- The discovery of the 125 GeV Higgs boson at LHC has vaulted the question of its properties on the top of the list of questions in HEP. The 125GeV boson is a window to BSM physics and ILC is an ideal machine to use it.
  So far no "definite" signs of additional new particles or new phenomena have been reported, suggesting that there seem to be no easily discoverable new particles. This situation enhanced the importance of the precision measurements of H125 and loophole-less searches at ILC more than ever. There can be a zoo of new uncolored particles or new phenomena in the blind spots of LHC but can be discovered and studied in detail at ILC. We also need to further investigate what the ILC's precision will imply in terms of BSM physics searches and identifications.

  We need to demonstrate that ILC will advance our understanding of particle physics qualitatively beyond the information that will be available from the results expected from various experiments but the time of the first collision at the ILC. We hence need to closely monitor, analyze, and examine developments of LHC and other experiments.

- With the strong support from the U.S. and favorable mention of ILC in a draft European Particle Physics Strategy Update 2020, LCB/ICFA met on Feb. 20, 2020 at SLAC together with a MEXT representative and a key diet member from Japan, and made a statement outlining the timeline towards ILC realization including International Development Team (IDT) hosted at KEK. IDT was established on Aug.2, 2020. After 10 months of hard work the IDT completed its Pre-lab proposal and submitted it to MEXT on June 2, 2021, which is to be evaluated by MEXT.
  We need to show that there is a strong community supporting ILC so as to encourage decision makers to decide favorably about the Pre-Lab startup. We need to show strong presence in the Snowmass process. The next target for us to show our activities is the Fall WS on Oct. 26 to 29, 2021 at KEK.

From Hitoshi's slides shown at a IDT WG3 meeting

Updates in Japan

MEXT formed an advisory panel

basically the same membership from a few years ago
new chair: Shoken Miyama, former DG of NAOJ
first meeting: July 29, 13:00-14:50, mostly orientation

https://www.mext.go.jp/b_menu/shingi/chousa/shinkou/064/kaisai/210729.htm

only four more meetings, completing by the end of the (fiscal) year to review

(1) international collaboration and cost sharing
(2) scientific significance and understanding by the science community and public
(3) clarification of technical feasibility
(4) appropriateness of the cost estimate
(5) prospect to secure human resources and required training
(6) other issues about the ILC

highlighted by KF

KF's Notes on the New Panel

ILC Advisory Panel (2021-7-29→2022-7-28: extensible if needed)

1. Shouken Miyama (chair) : Astronomy (theory)
2. Tomohiro Ichiji : Policy Innovation
3. Tatsuo Omachi : Civil Engineering
4. Sadanori Okamura : Astronomy
5. Haruyo Koiso : Accelerator
6. Michihisa Kyoto : JSPS
7. Noritaka Kumagai : Accelerator
8. Takahiro Shinyo : Diplomacy
9. Katsuo Tokushuku : HEP
10. Wako Tojima: Journalist
11. Takashi Nakano : NP
12. Shunsuke Mori : System Engineering, Ecology
13. Hiromi Yokoyama : Scientific Communication

No subcommittee formed this time

The panel seemed particularly interested in

1. International cost sharing
2. Understanding from general public and academia
3. Technological readiness

Aiming at finishing within CY2021 (after ~4 more meetings)

2021 Virtual HEP PI Meeting

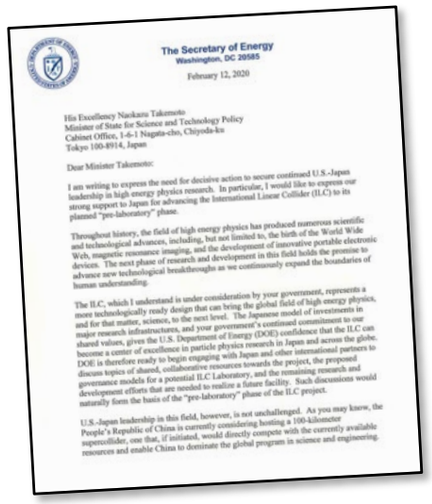
DOE, Office of Science, August 9 - 12, 2021

https://web.cvent.com/event/1ffa6b78-278d-48f1-8e8c-8432db2f4299/websitePage:e66aa057-84cb-4a74-9c11-c7d6038b7fa2

Seeding the Future: Energy Frontier Planning

- **Future collider strategy in the 2014 P5 plan**
  - Support development and realization of the ILC
  - R&D towards a very high-energy proton-proton collider
- **Advancing colliders of the proposed size, scale, and complexity requires intergovernmental discussions and global coordination**
  - Concerted effort during last ~3 years by U.S. Government to support a Japanese initiative to move forward to its proposed ILC "Pre-Lab" phase
    - DOE, U.S. State Department, The White House Office of Science & Technology Policy, National Security Council, and U.S. Defense Department
- **DOE coordinating with the ILC International Development Team, formed by ICFA in 2020, to prepare ILC for its "Pre-Lab" phase**
  - DOE looks forward to future intergovernmental discussions with Japan and other global partners on ILC

February 12, 2020: *Letter from the former U.S. Secretary of Energy Brouillette to Japan Cabinet S&T Policy Minister Takemoto conveying DOE's support to advance ILC to "Pre-Lab"*



The Secretary of Energy
Washington, DC 20585

February 12, 2020

His Excellency Naokazu Takemoto
Minister of State for Science and Technology Policy
Cabinet Office, 1-6-1 Nagata-cho, Chiyoda-ku
Tokyo 100-8914, Japan

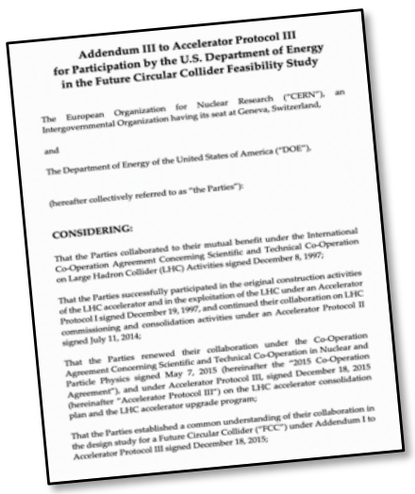
Dear Minister Takemoto:

I am writing to express the need for decisive action to secure continued U.S.-Japan leadership in high energy physics research. In particular, I would like to express our strong support to Japan for advancing the International Linear Collider (ILC) to its planned "pre-laboratory" phase.

Throughout history, the field of high energy physics has produced numerous scientific and technological advances, including, but not limited to, the birth of the World Wide Web, magnetic resonance imaging, and the development of innovative portable electronic devices. The next phase of research and development in this field holds the promise to advance new technological breakthroughs as we continuously expand the boundaries of human understanding.

The ILC, which I understand is under consideration by your government, represents a more technologically ready design that can bring the global field of high energy physics, and for that matter, science, to the next level. The Japanese model of investments in major research infrastructures, and your government's continued commitment to our shared values, gives the U.S. Department of Energy (DOE) confidence that the ILC can become a center of excellence in particle physics research in Japan and across the globe. DOE is therefore ready to begin engaging with Japan and other international partners to discuss topics of shared, collaborative resources towards the project, the proposed governance models for a potential ILC Laboratory, and the remaining research and development efforts that are needed to realize a future facility. Such discussions would naturally form the basis of the "pre-laboratory" phase of the ILC project.

U.S.-Japan leadership in this field, however, is not unchallenged. As you may know, the People's Republic of China is currently considering hosting a 100-kilometer supercollider, one that, if initiated, would directly compete with the currently available resources and enable China to dominate the global program in science and engineering.



Addendum III to Accelerator Protocol III
for Participation by the U.S. Department of Energy
in the Future Circular Collider Feasibility Study

The European Organization for Nuclear Research ("CERN"), an Intergovernmental Organization having its seat at Geneva, Switzerland,

and

The Department of Energy of the United States of America ("DOE"),

(hereafter collectively referred to as "the Parties"):

CONSIDERING:

That the Parties collaborated to their mutual benefit under the International Co-Operation Agreement Concerning Scientific and Technical Co-Operation on Large Hadron Collider (LHC) Activities signed December 8, 1997;

That the Parties successfully participated in the original construction activities of the LHC accelerator and in the exploitation of the LHC under an Accelerator Protocol I signed December 19, 1997, and continued their collaboration on LHC commissioning and consolidation activities under an Accelerator Protocol II signed July 11, 2014;

That the Parties renewed their collaboration under the Co-Operation Agreement Concerning Scientific and Technical Co-Operation in Nuclear and Particle Physics signed May 7, 2015 (hereinafter the "2015 Co-Operation Agreement"), and under Accelerator Protocol III, signed December 18, 2015 (hereinafter "Accelerator Protocol III") on the LHC accelerator consolidation plan and the LHC accelerator upgrade program;

That the Parties established a common understanding of their collaboration in the design study for a Future Circular Collider ("FCC") under Addendum I to Accelerator Protocol III signed December 18, 2015;

December 30, 2020: *DOE-CERN FCC Agreement*

- **2019: DOE partnered with CERN and European national laboratories on "FCC Innovation Study" proposal submitted to European Commission's Horizon 2020 Design Study initiative**
  - April 2020: European Commission selected CERN's proposal for funding
- **2020: DOE and CERN signed a FCC agreement to continue R&D for a 100 km collider in the Swiss-French area**
  - Also advances the next stage of feasibility studies emphasized in the 2020 Update of the European Strategy for Particle Physics

by Jim Siegrist, DOE HEP Director

https://newsline.linearcollider.org

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27 JULY 2021

PREPRINTS

27 JULY 2021

2107.12789
Electroweak baryogenesis via bottom transport: complementarity between LHC and future lepton collider probes

2107.12730
Dark matter searches with mono-photon signature at future e+e− colliders

2107.11194
Sensitivity of future e+e− colliders to processes of dark matter production with light mediator exchange

2107.03398
Asymmetric Dark Matter May Not Be Light

2107.02031
Time-of-flight estimation by utilizing Kalman filter tracking information — Part I: the concept

2106.16029
Parameter dependence of the neutral Higgs boson production and decay in the two Higgs doublet model

2106.11105
Sensitivity to Triple Higgs Couplings via Di-Higgs Production in the 2HDM at e+e- Colliders

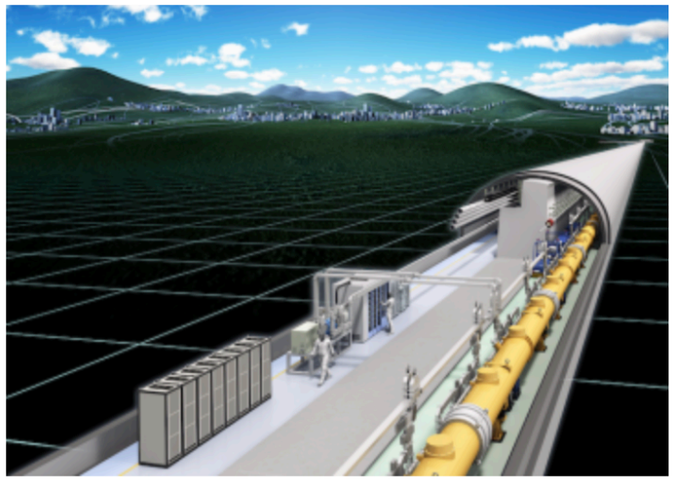
2106.09278
Precision Higgs Measurements at the 250 GeV ILC

2106.02846
Probing heavy charged fermions at e+e− collider using the

DIRECTOR'S CORNER

Unite behind the ILC now

by Geoffrey Taylor

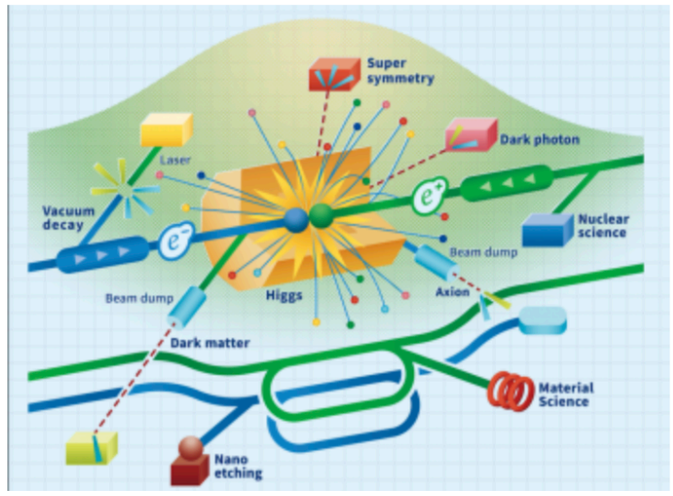


Asian countries are highly engaged internationally and Asian scientists continue to be at the forefront of international science. With the ILC, the International Linear Collider, Asia has the opportunity to host the most significant global collider in the coming decades.

ANNOUNCEMENTS

ILCX: hybrid or fully online

by Hitoshi Murayama



Now is the time to dream up for new ideas of experiments at the ILC facility! Register for the ILC Workshop on Potential Experiments (ILCX2021) from 26 to 29 October 2021, which will be held either in the hybrid mode or fully online.

ANNOUNCEMENTS

Invitation to join the SiD Consortium for the ILC

FEATURE

Ready to take the next step

by Barbara Warmbein

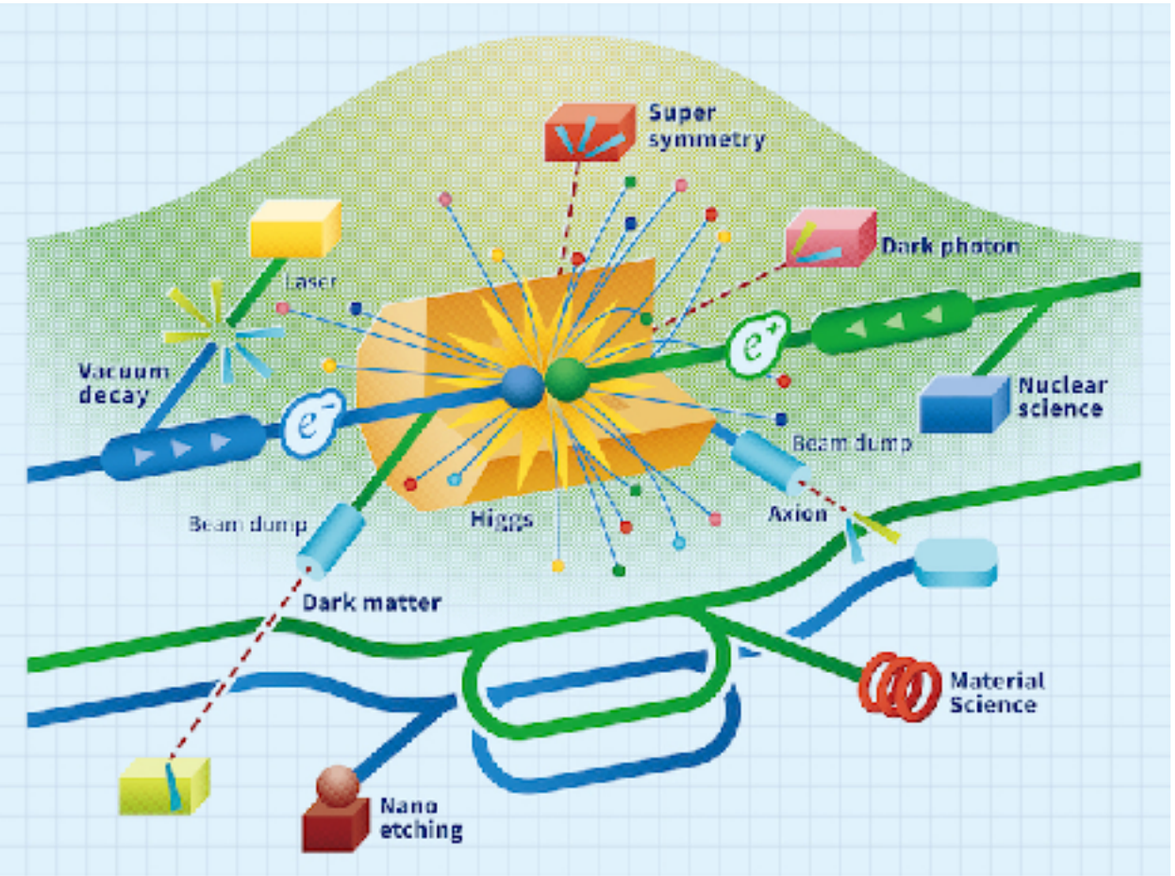
https://agenda.linearcollider.org/event/9211/

ILCX2021 ILC Workshop on Potential Experiments

ILC Workshop on Potential Experiments (ILCX2021)

26-29 October 2021
KEK Tsukuba campus (in the case of hybrid meeting) or fully online
Asia/Tokyo timezone

Enter your search term



Pre-registration open!

Registration

Pre-registration before final decision between a hybrid meeting on the KEK site vs a fully online meeting

Contact Info
ILCX2021 Local Organizing Committee:
ilcx2021@ml.post.kek.jp

After the final decision is made sometime in late August or early September, pre-registrants will be asked to register for on-site participation. At that time, pre-registrants will be required to pay the registration fee and make reservations for accommodation, meals, and optional tours.

Please register if you haven't

Physics Potential & Opportunity Group

- Schedule for regular open meetings:
  August 12: talks from Tim Barklow on eγ→eH and on the new CEPS paper
  September 16: talks from Matt Basso on H→ss and from Yu Kato on H→4b
  No meeting in October
  Nov.11, Dec. 16, Jan. 13, Feb. 10, Mar. 10, Apr. 14

- Snowmass is restarting (EF from July);
  EF workshop **Aug. 30 - Sep.3** https://indico.fnal.gov/event/49756/

Software & Computing Group

Software tutorials https://agenda.linearcollider.org/category/273/

- **July 21, Introduction to iLCSoft:** https://agenda.linearcollider.org/event/9272/
- **August 18, LCFIPlus:** https://agenda.linearcollider.org/event/9318/
- **September 15**, SGV fast simulation: https://agenda.linearcollider.org/event/9319/

Our Group's Activities

Today

10:30 → 10:50 **Opening Remarks**

Speaker: Keisuke Fujii

10:50 → 11:10 **Study of HγZ coupling using e+e-→γH**

Speaker: Yumi Aoki (SOKENDAI,KEK)

11:10 → 11:30 **Tau reconstruction in e+e− → τ+τ− at the ILC250**

Speaker: Keita Yumino (SOKENDAI)

11:30 → 11:50 **Jet energy calibration using e+e- →γZ process at the ILC**

Speaker: Takahiro Mizuno (Sokendai)

11:50 → 13:00 **Lunch break**

13:00 → 13:20 **Exploring Right Handed Neutrinos at ILC**

Speaker: Jurina Nakajima (SOKENDAI/KEK)

13:20 → 13:40 **Search of Higgs decaying to exotic scalers using kinematic fit**

Speaker: Yu Kato (University of Tokyo)

13:40 → 14:10 **Discussions**

Short Term Schedule

- Weekly Meeting
  - Every Fri. at 14:30 (conf. ID: to be announced)
- General Meeting
  - 10:30 on Wed. Oct .20, 2021? (or on Saturday?)

- Snowmass EF WS, Aug. 30 - Sep. 3, 2021
- ILC WS on Potential Exp., October 26-29, 2021 (Tsukuba)
- Snowmass Summer Study: July, 2022 (Seattle)