Opening Comments

2022/09/02

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: g-2, Mw, ...

- The International Development Team (IDT) completed its Pre-lab proposal and submitted it to MEXT on June 2, 2021. Simultaneously, JAHEP and KEK submitted a summary of past 3 years of efforts addressing various issues pointed out by the MEXT ILC panel and the SCJ ILC committee. The MEXT panel was then renewed to review them. The panel published its final report on Feb. 14, 2022. See KEK news issued on Feb. 25, 2022. On April 10, the ICFA issued a "statement regarding Higgs factory development and the ILC", in which the extension of the IDT at least for one year was announced.
  We need to show that there is a strong community supporting ILC.

IDT WG1 Report by Tatsuya (Apr. 26)

Warning: this is KF's private notes

IDT EB's observation of the situation

- The most serious obstacle that blocked Pre-lab start: mismatch btw our view and MEXT's view regarding Pre-lab's roles, the process towards the int'l agreement on the ILC realization, in particular
  - MEXT is expecting ITER-like process, which would bring us back to the chicken and egg situation

Possible way out

- 2-step procedure:
  1. agreement on a generic process (like US's CD process?) applicable to any big-scale HEP projects, based on ***project lifecycle analysis***. (Idea is to convince MEXT that pre-lab is not its point of no return)
  2. application of the generic process to the ILC case
- Step 1 requires a generic project lifecycle document
  → to be prepared by ***an ICFA-endorsed international WG*** → ***IEP***

IDT Phys/Det WG (WG3)

https://linearcollider.org/team/wg3/

Last WG3 Meeting yesterday on August 16

- ***IDT report from Tatsuya***
  - ***ILC technology network: with works identified, preparing for matching btw labs and works. Budget discussion btw KEK and MEXT on going.***
    - ***→ Request sent recently to MOF: ~2x 2022 budget***
  - ***Int'l Expert Panel (IEP) started discussing lifecycle of general big projects.***
    - ***interim report (end CY2022), final report (spring 2023)***
- ***Subgroup reports***
  - ***MDI: WS on SC detector magnet: Sep. 12-14***

https://indico.cern.ch/event/1162992/

from Tatsuya's talk @ Snowmass Seattle Mtg

IDT International Expert Panel members

Panel members

Ursula Bassler	(FR)
Philip Burrows	(GB)
Beate Heinemann	(DE)
Stuart Henderson	(US, ICFA Chair)
Karl Jacobs	(DE, EFCA Chair)
Andrew Lankford	(US, IDT-EB Americas)
Nadia Pastrone	(IT)
Antonio Pich	(ES)
Steinar Stapnes	(CERN, IDT-EB Europe)
Nigel Smith	(CA)
Geoffrey Taylor	(AU, IDT-EB Asia-Pacific)
Katsuo Tokushuku	(JP)

Core Group

- Andrew Lankford
- Steinar Stapnes
- Geoffrey Taylor

Chair

- Tatsuya Nakada (IDT-EB Chair)

Scientific Secretary

- Wataru Ootani (IDT EB Scientific Secretary)

Endorsed by the ICFA together with its charge

Snowmass Workshop is Over

http://seattlesnowmass2021.net

Indico Page

https://indico.fnal.gov/event/22303/timetable/

Draft Reports and Feedback from

https://snowmass21.org/energy/start

- ***Snowmass briefing by Jan Strube and Michael Peskin at Aug. 2 IDT WG3 meeting:***
  - ***HF as the next global project***
  - ***muon collider got huge revival***
  - ***FCC-ee (realistically earliest 1st beam in 2048)***
  - ***Recommendation to double US detector R&D budget***
  - ***Hitoshi Murayama will chair P5***
    - ***→ IDT EB will nominate a new WG3 chair soon***
- ***.....***

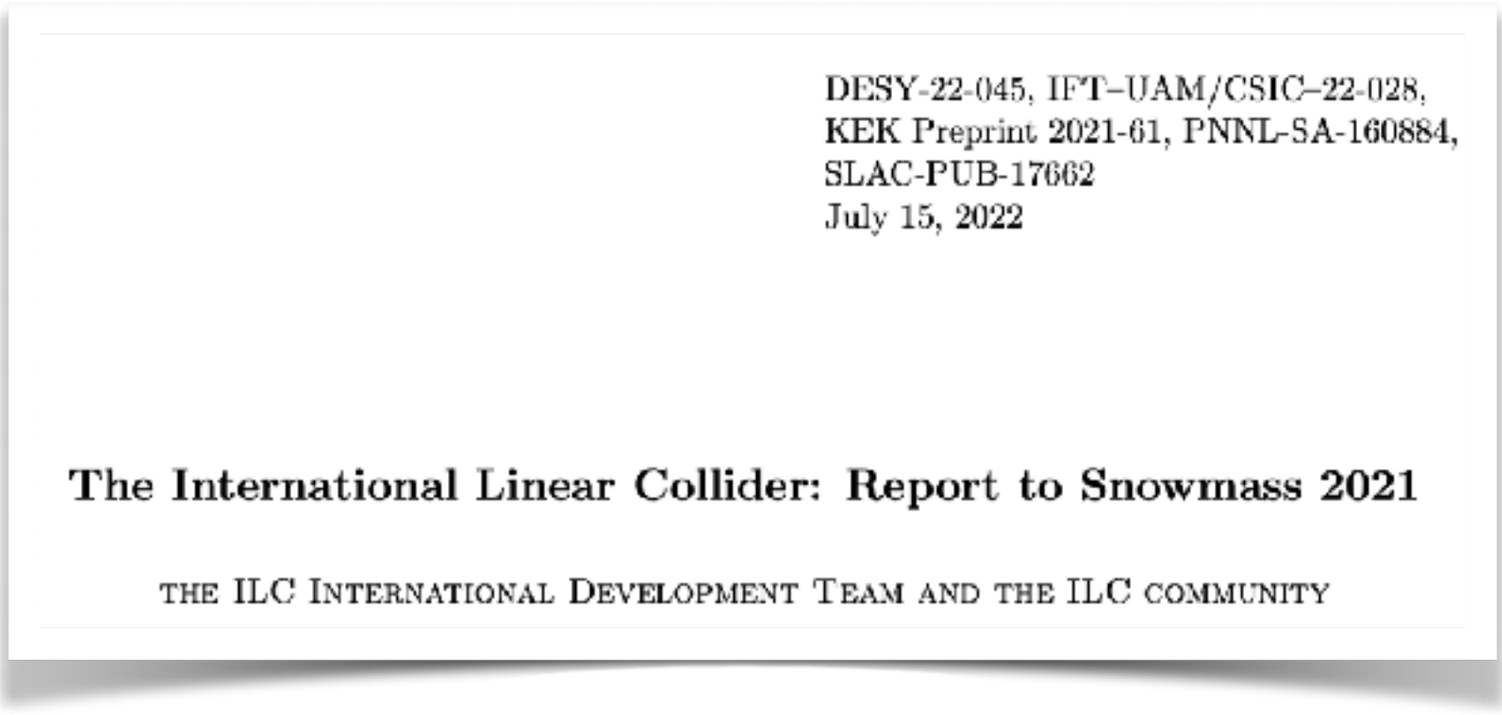
Reminder

Registration Page for
The ILC White Paper for Snowmass 2022

Register on the authors/supporters list for the ILC White Paper for Snowmass through

https://agenda.linearcollider.org/event/9135/

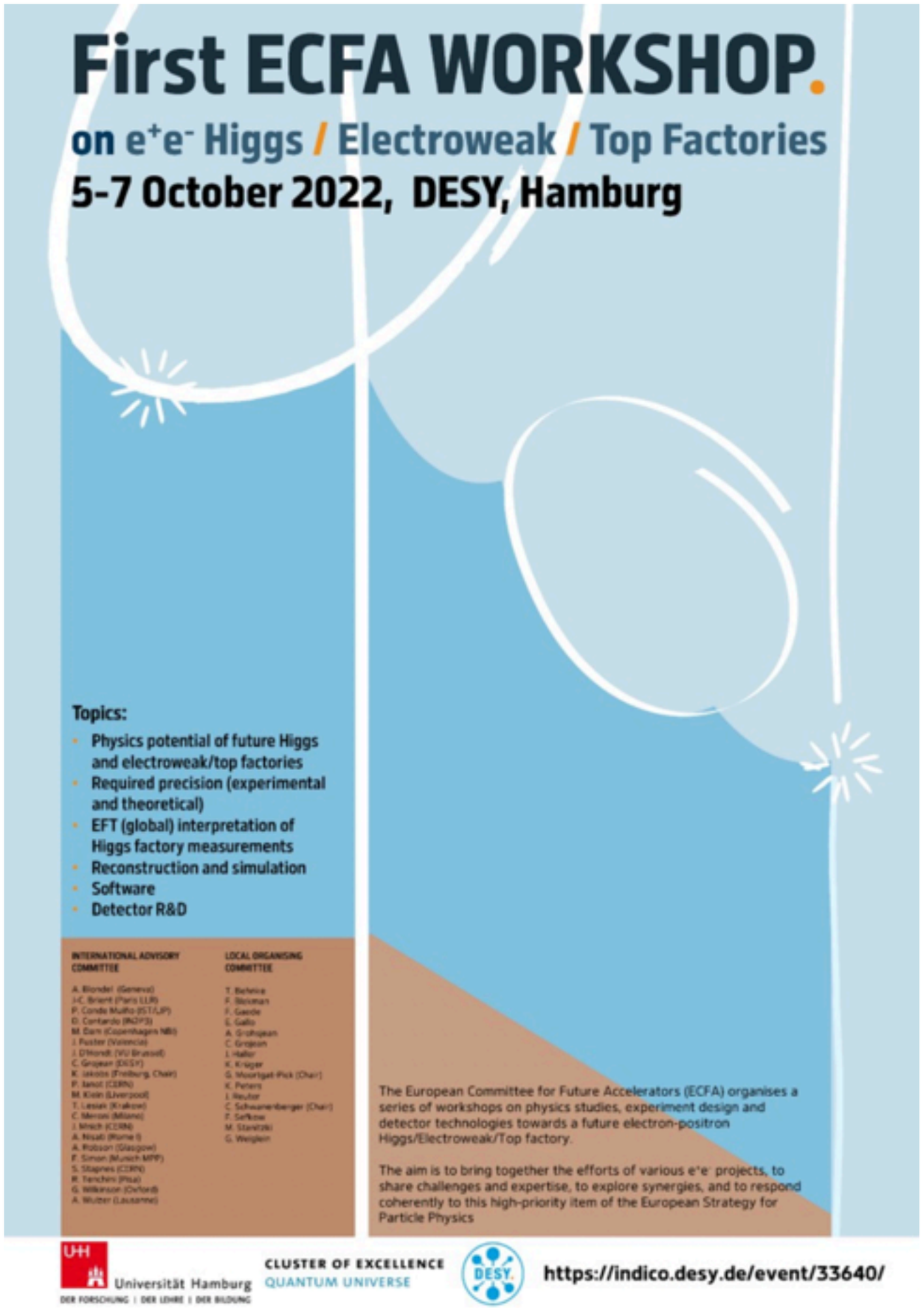
where you can also find the current version (arXiv:2203.07622v2, July 14, 2022) of the white paper.
Take a look and send comments to Michael Peskin.



DESY-22-045, IFT–UAM/CSIC–22-028,
KEK Preprint 2021-61, PNNL-SA-160884,
SLAC-PUB-17662
July 15, 2022

The International Linear Collider: Report to Snowmass 2021

THE ILC INTERNATIONAL DEVELOPMENT TEAM AND THE ILC COMMUNITY



https://indico.desy.de/event/33640/

The 2022 meeting of the ECFA study on physics and experiments at e+e- Higgs/ EW/Top Factories will take place in Hamburg at the **campus of the DESY laboratory** from **October 5 to 7, 2022**.

This meeting is intended to be an **in-person meeting**.

The registration fee is 165 EUR until **September 15th 2022**, and 200 EUR thereafter.

The central entry point of the ECFA study is accessible through this link.

#42 Higgs physics at the ILC

With technically mature design and well understood physics program, ILC is a realistic option for realization of a Higgs factory. With a unique physics reach of a linear collider, ILC will significantly complement projections for HL-LHC. Energy staged data collection, employment of beam polarization and capability to reach a TeV center-of-mass energy enable unique precision measurements of various Higgs couplings including its self-coupling. These precision measurements will allow to probe BSM indirectly beyond the reach of direct search at the LHC. This talk will address the simulation studies based on the ILD detector concept for the Higgs physics program at the ILC.

#60 New physics searches with the ILD detector at the ILC

Although the LHC experiments have searched for and excluded many proposed new particles up to masses close to 1 TeV, there are many scenarios that are difficult to address at a hadron collider. This poster gives an overview of recent ILD studies on new particle searches at the ILC. The cases discussed include the light Higgsino, the stau lepton in the coannihilation region relevant to dark matter, and heavy vector bosons coupling to the s-channel in e+e– annihilation.

#82 From strange to top: activities of the Top/QCD/HF physics group of ILD

The process ee->qq with qq=ss,cc,bb,tt plays a central role in the physics programs of high energy electron-positron colliders operating from the O(100GeV) to O(1TeV) center of mass energies. Furthermore, polarised beams as available at the International Linear Collider (ILC) are an essential input for the complete measurement of the helicity amplitudes that govern the production cross section. Quarks, specially the heaviers, are likely messengers to new physics and at the same time they are ideal benchmark processes for detector optimisation. All four processes call for superb primary and secondary vertex measurements, a high tracking efficiency to correctly measure the vertex charge and excellent hadron identification capabilities. Strange, charm and bottom production are already available below the ttbar threshold.
This contribution will cover the most relevant and latest activities of the ILD concept group on physics studies related to heavy quarks, using detailed simulation and realistic analysis tools
to determine the full potential of ILC on this area. Some of the topics to be discussed will be the top-quark mass measurements, top and less heavy quarks electroweak couplings or BSM searches at ILC with the ILD.

Our Group's Activities

Today

https://agenda.linearcollider.org/event/9786/

10:30 → 10:50 **Opening Remarks** 20m
Speaker: Keisuke Fujii

10:50 → 11:10 **Measuring the tau polarisation at ILC** 20m
Speaker: Keita Yumino (SOKENDAI)

11:10 → 11:30 **Development of ILC shower clustering algorithm using Deep Neural Network** 20m
Speaker: Shusaku Tsumura (Kyushu University)

11:30 → 11:50 **TBA** 20m
Speaker: Mr Tomoki Onoe (Kyushu University)

12:00 → 13:00 **lunch** 1h

13:20 → 13:50 **Discussions** 30m

Short Term Schedule

- Weekly Meeting
  - Every Fri. at 14:30 (conf. ID: to be announced)
- General Meeting
  - 10:30 on Fri. Nov. 25, 2022? (or on Saturday?)
- JPS meeting: September 6-8 (Okayama)
- 1st ECFA H/EW/t WS: October 5-7, 2022 (Hamburg)