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# ILD Status and Plans (+ PSB report)

ILD meeting at KEK, February 26, 2019  
Kiyotomo Kawagoe, Kyushu University

# Welcome to the ILD meeting

- 2008 Jan: DESY Zeuten (The first meeting when LDC+GLD merged to ILD)
- ...
- 2014 Sep: Oshu
- 2015 Apr: Tokyo (during ALCW2015)
- 2015 Nov: Whistler (during LCWS2015)
- 2016 Jun: Santander (during ECFALC2016)
- 2016 Dec: Morioka (during LCWS2016)
- 2017 Apr: Lyon (Software & Analysis meeting)
- 2017 Jun: SLAC (during ALCW2017)
- 2017 Oct: Strasbourg (during LCWS2018)
- 2018 Feb: Ichinoseki
- 2018 Jun: Fukuoka (during AWLC2018)
- 2018 Oct: Arlington (during LCWS2018)
- **2019 Feb: KEK (We are here now)**
  
- **Monthly phone meetings usually on the first Tuesday of each month**

# Important meetings

- 2019 Mar 7-8: ICFA/LCB in Tokyo
  - An official statement of Japanese government on the ILC will be presented for the first time.
- 2019 Apr 8-9: LC community meeting in Lausanne
- 2019 May 13-16: EPPSU open symposium in Granada
  
- Note: No ECFA-LC meeting planned in this Spring
- LCWS2019 ??
  - When/Where/How may depend on the results of the meetings above

# A series of meetings at KEK in February

- Feb 23-25: ILD Benchmark Days II
  - The first one was held in last October in Arlington
  - Fruitful discussions and interactive works of analyzers and reviewers
  - Define the input to the IDR Section 8
    - Review status of the analyses
    - Select material for the IDR
  - Summary reports to be presented tomorrow
- **Feb 26-27: ILD meeting**
  - Discuss the state of ILD just before we start to write/ finalise the IDR
  - Understand the progress in optimization
  - Discuss plans for ILD in the future
- Feb 28: Mini-workshop on infrastructure and CFS for physics and detectors
  - Accelerator and detector people meet together.
  - Dedicated to discussions on the detector-driven infrastructure needs for the ILC campus at the IP and at the central lab.

# Agenda of the meeting (Tue)

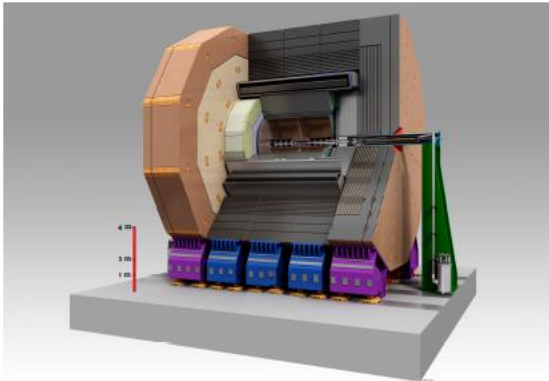
- Subdetector Session I
  - Vertex Detectors (Akimasa Ishikawa)
  - Time Projection Chamber (Serguei Ganjour)
  - Silicon Tracking (Marcel Vos)
  - Discussion
- Plenary I
  - The ILC status in Japan
  - ILD status and Plans
  - From Detector Modelling to Reconstruction Performance (Frank Gaede)
  - HLR Performance (Remi Ete)
- Subdetector Session II
  - Electromagnetic Calorimeter (Wataru Ootani)
  - Forward Calorimeters (Yan Benhammou)
  - Coil (Toshiaki Tauchi)
- Future of ILD
  - Discussion

# Agenda of the meeting (Wed)

- Detector integration
  - ILD integration (Karsten Buesser)
  - ILD alignment and calibration
- Subdetector session III
  - Muon system / Yoke (Valeri Savelief)
  - Hadronic Calorimeters (Imad Laktineh)
- Status of Benchmarking
  - Summary of the 3-day discussion to be presented
- Plenary II
  - Costing ILD
- Plenary III
  - The IDR: Status and way forward
- Plenary IV
  - Discussion

# The ILD document as an input to EPPSU

- Submitted on Dec 18, 2018
  - The document is shown on the EPPSU indico page
  - <https://indico.cern.ch/event/765096/contributions/3295752/>
- We intend to submit the document to arXiv after a proper review process in ILD
  - The document will be essentially same as that submitted to EPPSU, with possible improvement through the review process (reviewer: Daniel Jeans from PSB)
  - Circulation in the ILD hopefully soon
  - “author list” to be attached



The ILD Detector at the ILC

Contact: Ties Behnke  
Deutsches Elektronen Synchrotron, DESY, Germany

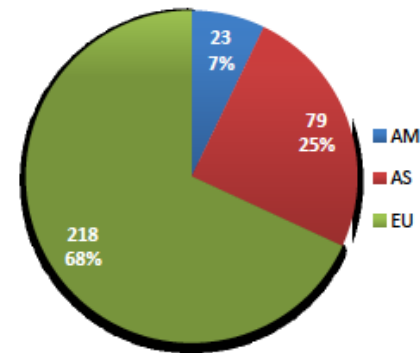
(Contribution to the update of the European Strategy for Particle Physics by the ILD Concept Group)  
(Dated: December 18, 2018)

The international large detector, ILD, is a detector concept which has been developed for the electron-positron collider ILC. The detector has been optimised for precision physics in a range of energies between 90 GeV and 1 TeV. ILD features a high precision, large volume combined silicon and gaseous tracking system, together with a high granularity calorimeter all inside a 3.5T solenoidal magnetic field. The paradigm of particle flow has been the guiding principle of the design of ILD. In this document the required performance of the detector, the proposed implementation and the readiness of the different technologies needed for the implementation are discussed. This is done in the framework of the ILC collider proposal, now under consideration in Japan, and includes site specific aspects needed to build and operate the detector at the proposed ILC site in Japan.

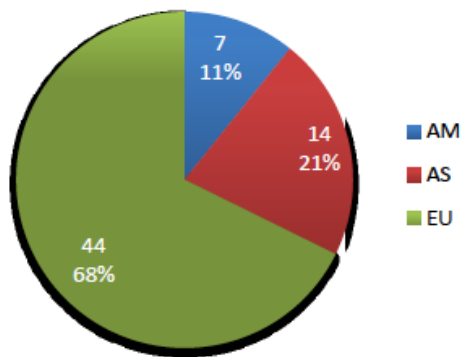
# Institutions and members as of December 2018 (signed on the webpage)

- 65 institutions
- 320 members
- The author list to be updated

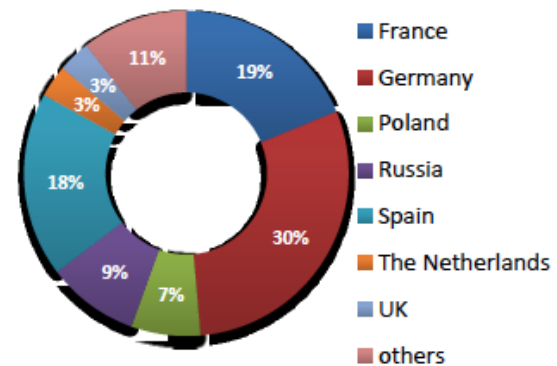
members per region



institutes per region



members per european country



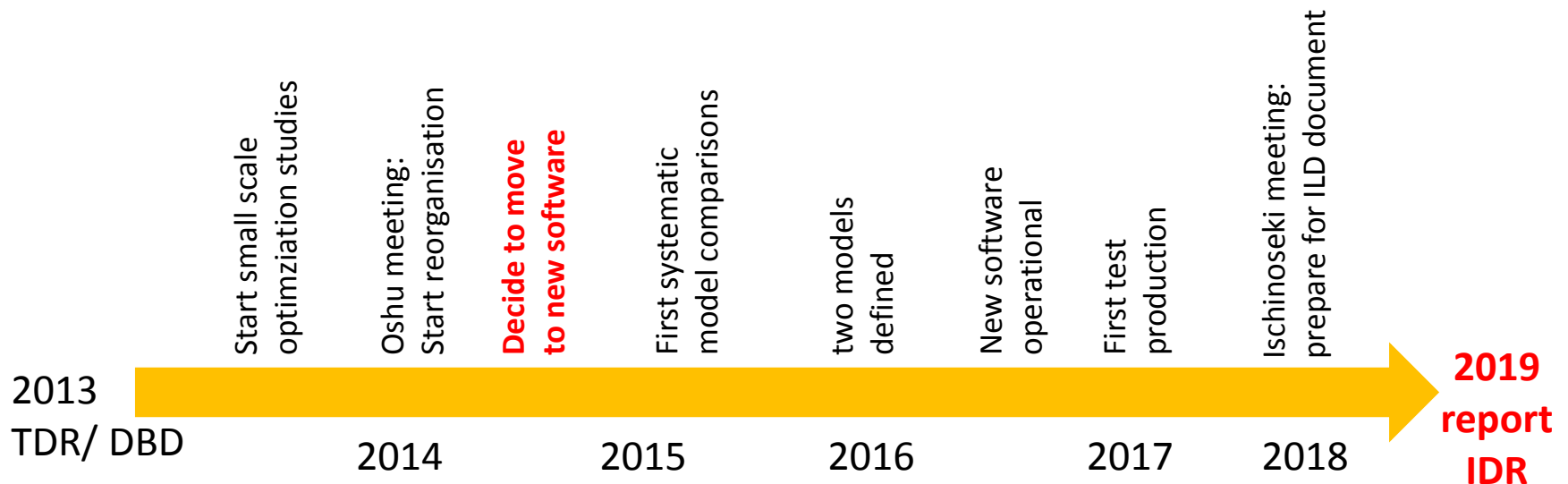


# ILD since 2013

Re-optimize ILD for optimal performance and cost/ performance ratio

Prepare the group to quickly ramp up activities in case of a positive decision

Provide a basis for realistic physics studies to make and improve the science case for the ILC. Most recently, strong push to make 250 GeV case



# Goal of ILD Design Report (IDR)

1. Make the science case for ILC as strong as possible
2. Define a performance/ cost optimized ILD detector
3. Demonstrate the performance of the ILD concept
4. Develop a realistic implementation of the ILD detector
5. Document the
  1. Design
  2. Engineering
  3. Performanceof the ILD detector model

# Draft status of IDR

IDR draft is available on overleaf

<https://www.overleaf.com/read/jrxfbssqfgs>

We are still developing an optimised way how to work on the IDR as a group:

- Overleaf for “everyone” as an easy interface
- Git version for experts and those who want to work offline
- Technical issues are still worked out.

Editing of the IDR has started in earnest, people are invited to submit material to IDR on the different sections.

Names / editors for all sections are defined and visible in the text.

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A complete draft by the end of May  
 The final draft by the end of June

# Future of ILD

- Discussion later today and tomorrow
- MEXT is going to present an official statement of Japanese government at the ICFA/LCB meeting on March 7 in Tokyo.
- Let's assume a positive statement (how positive ??).
  - Reaction to the EPPSU process
    - The ILC must be well described in the final document of EPPSU (May 2020).
    - IDR should be published as a support document.
  - Toward a “real” experimental group
    - New institutions, new members
    - New detector concepts ? One or two detectors ?
  - Toward Technical Design Report
    - Further optimization of the detector
    - Further R&D of subdetectors
    - New technologies of subdetectors
    - Technical choice of subdetectors
    - Planning of detector construction/installation
    - Task sharing and cost sharing

# PSB report

<https://confluence.desy.de/display/ILD/ILD+Publication+and+Speakers+Bureau>

# Topical papers in progress

1. “Full simulation study of the process  $e+e\rightarrow bb$  at  $\sqrt{s} = 250$  GeV at the ILC”, Sviatoslav Bilokin et al.
  - Reviewers: Keisuke Fujii and Mikael Bergrén
  - Already in arXiv: <https://arxiv.org/abs/1709.04289>
  - **Paper draft for a journal being prepared.**
2. “Sensitivity to anomalous VVH couplings at the ILC”, Tomohisa Ogawa (Sokendai) et al.
  - Reviewers: Jenny List and Ivanka Bozovic-Jelisavcic
  - **Draft for reviewers should be available by End of March**
3. “Naturalness and light Higgsinos”, Suvi, Tomohiko, et al.
  - Reviewers: Daniel Jeans + Akimasa Ishikawa
  - **Draft for reviewers being prepared, aiming for End of March.**
4. “Kinematic Edge Detection Using Finite Impulse Filters”
  - Authors: Madalina Chera and Stefano Caiazza
  - Reviewers: Daniel Jeans and Remi Ete
  - **Draft for reviewers coming soon.**

# Topical papers in progress (cont'd)

5. “Higgs decay into a muon pair”, Shin-ichi Kawada *et al.*
  - Reviewers: Ivanka Bozovic and Filip Zarnecki
  - First draft was sent to the reviewers.
6. “Search for low mass scalar particles ”, Yan Wang *et al.*
  - Reviewers: Daniel Jeans + Akimasa Ishikawa
  - Draft for reviewers is expected in ~~December~~ April/May.
7. **NEW:** “WIMP study with ILD DBD samples”
  - Authors: Moritz Habermehl
  - Reviewers: Filip Zarnecki and Tomohiko Tanabe
  - Draft for reviewers will be ready by End of March or earlier.



# Conference proceedings

- ICHEP 2018, Seoul, Korea
  - 3 ILD talks (Daniel, Yan, Sviatoslav)
  - 2 LCC talks (Mikael, Tomohisa)
  - ILD-PHYS-PROC-2018-004~008
- Windows on the Universe, Quy Nhon, Vietnam
  - 2 ILD talks (Shin-ichi, Ryo)
  - ILD-PHYS-PROC-2018-009~010
- Higgs Couplings 2018, Tokyo, Japan
  - 4 ILD talks were presented.
  - No proceedings were required.
- LCWS2018, Arlington, USA
  - Proceedings are voluntary
  - Six contributions have been reviewed and submitted,
    - Shin-ichi, Mlila, Yumi, Yuto, Yuto, Yan
  - ILD-PHYS-PROC-2019-001~006

# Coming conferences in 2019

- EPS-HEP2019, Ghent, July 10-17
  - Abstract submission by April 15
- APS/DPF meeting, Boston, July 29 – August 2
  - Abstract submission to be opened
- Lepton-Photon 2019, Toronto, August 7-12
  - Abstract submission by April 15