
ILC
plans
Gerald Eigen, University of Bergen
Town meeting in Bergen , August 24 2018
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Involvement in ILC

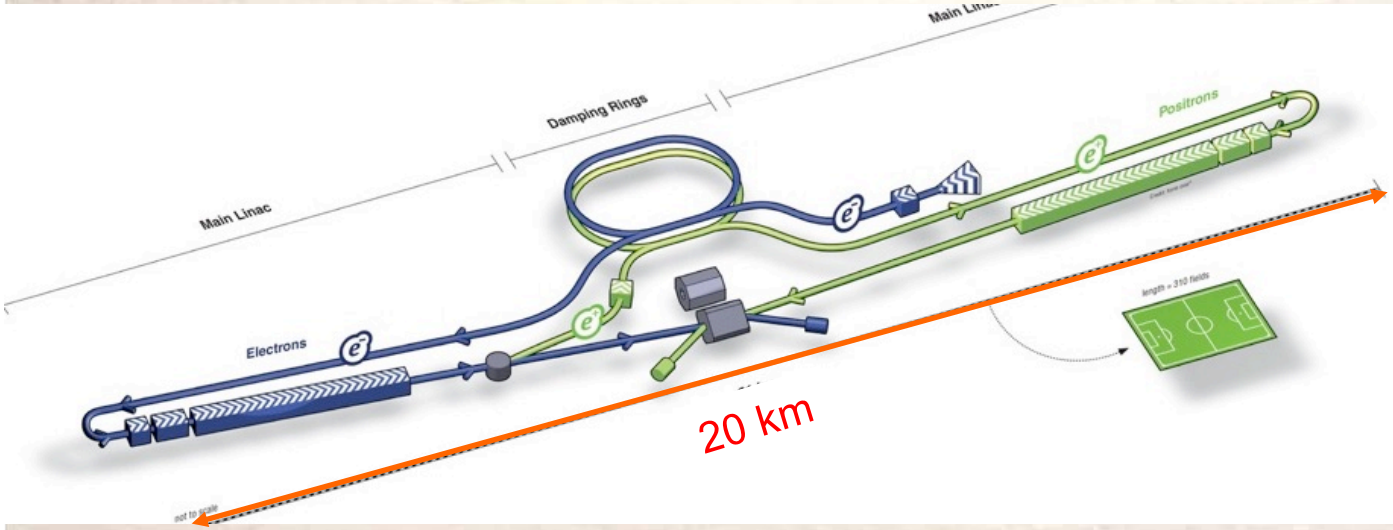
- Eigen has been involved in ILC activities since 2003 when he was on sabbatical at DESY working on construction and tests of prototypes of the analog hadron calorimeter that is based on the concept of particle flow
- Eigen's involvement was initiated by a request of former DESY director Bjørn Wiik, who wanted to get Bergen to support his TESLA project (Wiik passed away in 1999 in a tragic accident and TESLA did not happen)
- The linear collider community now proposes a 250 GeV ILC in Japan (Katakami site) awaiting approval by the Japanese government ➔ decision has to be made before March 7, 2019; this is the date of the next ICFA meeting in Tokyo
- Eigen was member in the EU projects AIDA and is member in AIDA2020 ➔perform Calorimeter R&D; he joined the CALICE collaboration in 2009
- Since a few years two ILC detector collaborations evolved, ILD and SiD
  ➔ First, Eigen became a member of ILD but then moved to SiD,
- Eigen gave felles seminar on the ILC project May 5, 2017
- The report of the German Strategy Workshop with 159 participants states that **a linear collider with a CM energy of 250 GeV is a unique opportunity to explore the properties of the Higgs boson in great detail**

http://www.ketweb.de/e199632/e199635/e268373/e296589/Abschlusserklaerung.pdf

In 2012, Eigen was asked to join CLICdp, detector collaboration for CLIC

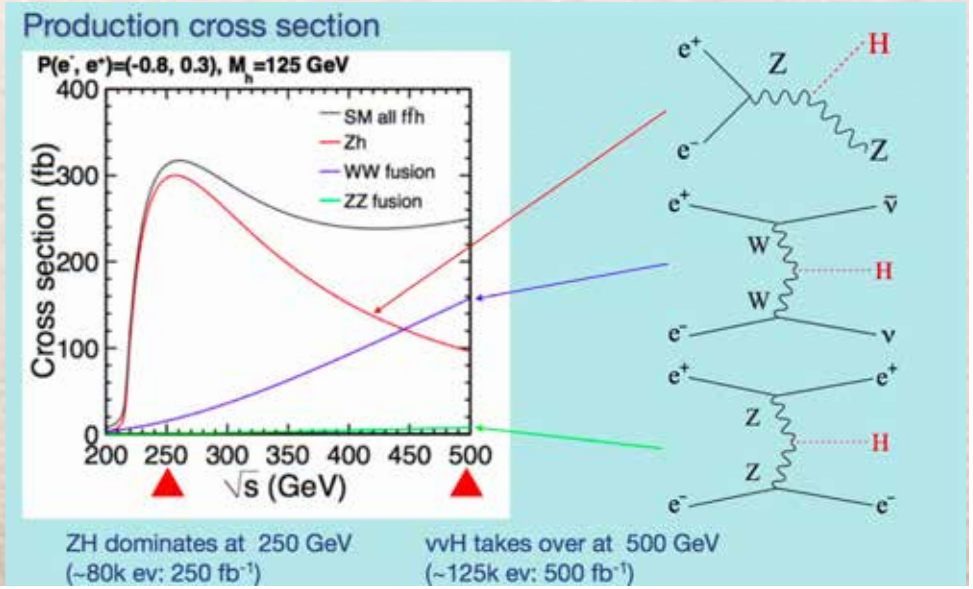
Present ILC Design

- 250 GeV CM energy e^+e^- linear collider hosting 2 experiments in push-pull scheme



Item	Parameters
C.M. Energy	250 GeV
Length	20.5 km
Luminosity	1.35 x10^{34} $cm^{-2}s^{-1}$
Repetition	5 Hz
Beam Current	5.8 mA (in pulse)
Beam size (y) at FF	7.7 nm
SRF Cavity G.	31.5~35 MV/m

- Operate for ~10 years to log 2000 fb^{-1}
- Consider upgrade to 500 GeV CM energy



Plans

- Eigen's interest in ILC is to perform precision measurements of the Higgs boson couplings to look for physics beyond the Standard Model and study Higgs self-couplings
  ➔ basically to continue the Higgs work at LHC at a Higgs factory

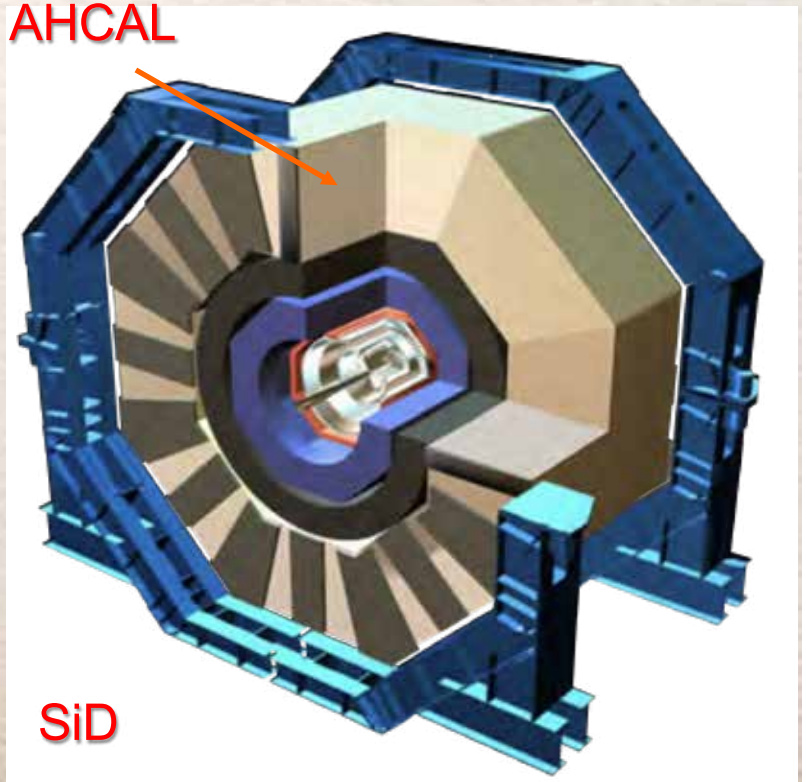
- Presently, main focus is calorimeter R&D, which is covered in Bjarne's talk
  ➔ the generic calorimeter R&D is also useful for CLICdp and future experiments

- Participate in the construction of the analog hadron calorimeter for SiD

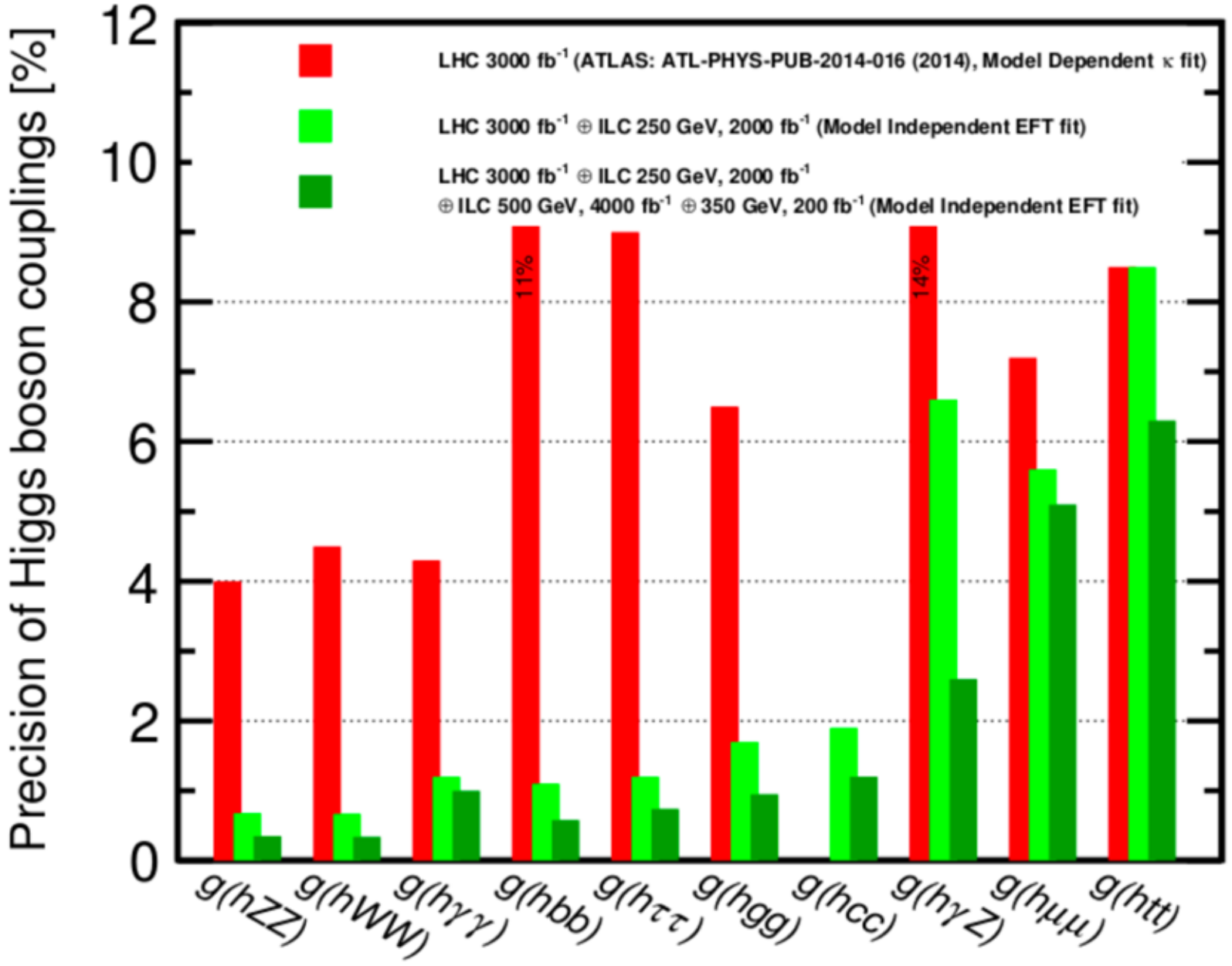
- Start Higgs studies in simulations
  e.g.: $H \rightarrow 4\mu$, $H \rightarrow 2\mu$, $H \rightarrow Z\gamma$

- There is a possible interest by the Norwegian physicists to establish contact with KEK, which will play an important role in a potential ILC construction

- There are also possibilities to establish Japan-Norway relations via Belle II

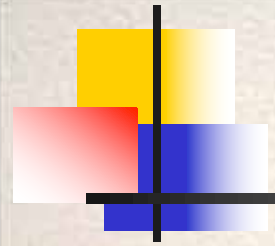


Precison of Higgs Couplings



ILC Timeline

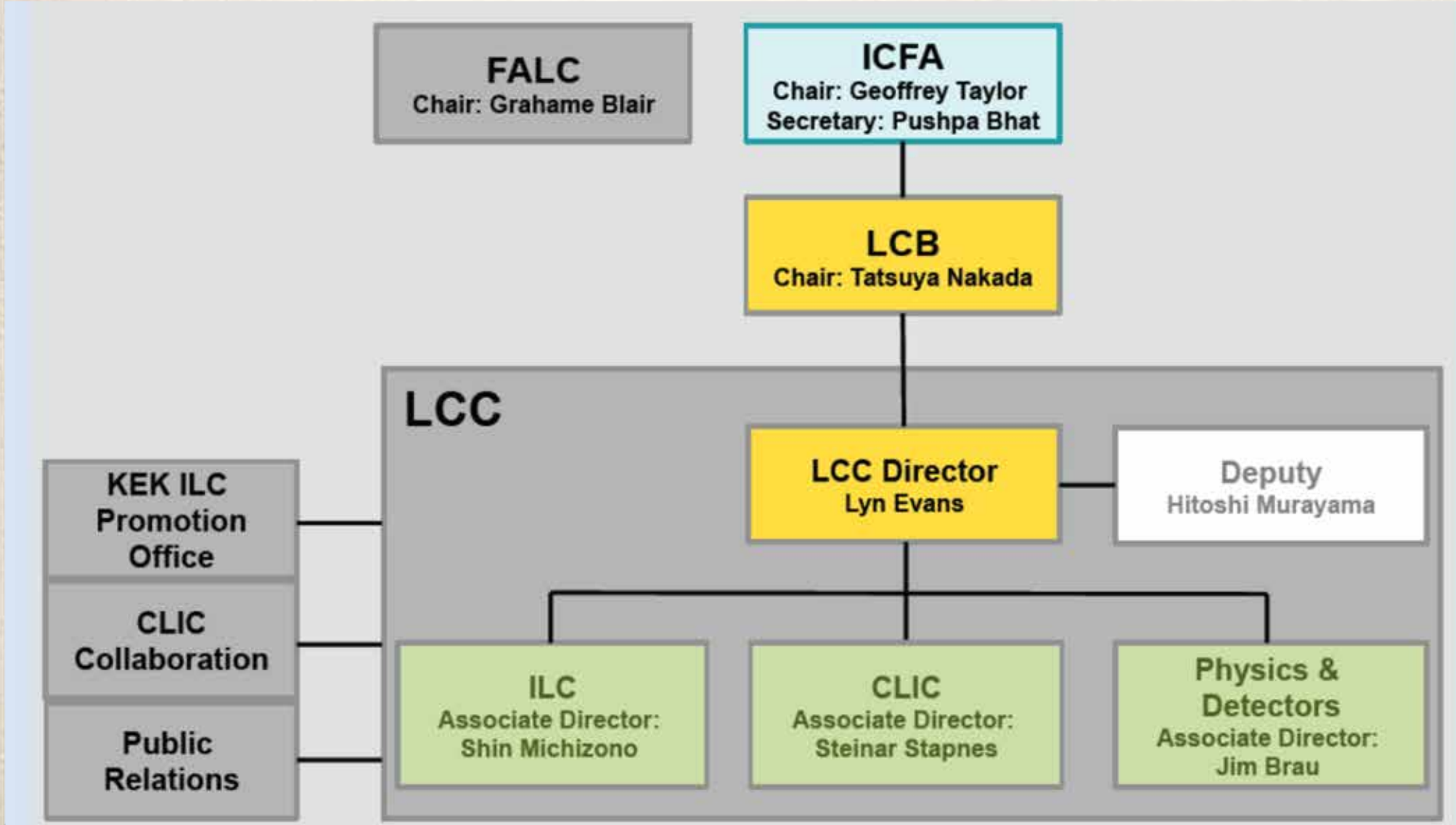
- Fall 2012: The Japanese HEP community expresses interest to host the ILC in Japan
- May 2013: ILC design report is published and the European Strategy for High Energy Physics supports the ILC in Japan
- Fall 2013: MEXT starts evaluation of ILC for possible realization in Japan
- MEXT set up 4 working groups under the ILC advisory panel
  Particle and Nuclear Physics WG & TDR validation WG (March 2015), Human resources WG (July 2016) & Organization and Management WG (August 2017) ➔ first two WGs were reactivated after design change to 250 GeV
- July 4, ILC Advisory Panel meeting
- July 5, meeting of the panel with prime minister Abe
- Autumn 2018, expect decision by MEXT,
- End 2018, expect decision by government
- Meanwhile, the political process continues, including visits of Diet members to Germany, France and the US
  ➔ additional visits are planned to Spain, Italy, UK later 2018 or early 2019



Backup

Slides

LCC Organization



ILC Site Candidate in Japan: Kitakami

- Preferred site selected by JHEP community,
- Endorsed by LCC, in 2013