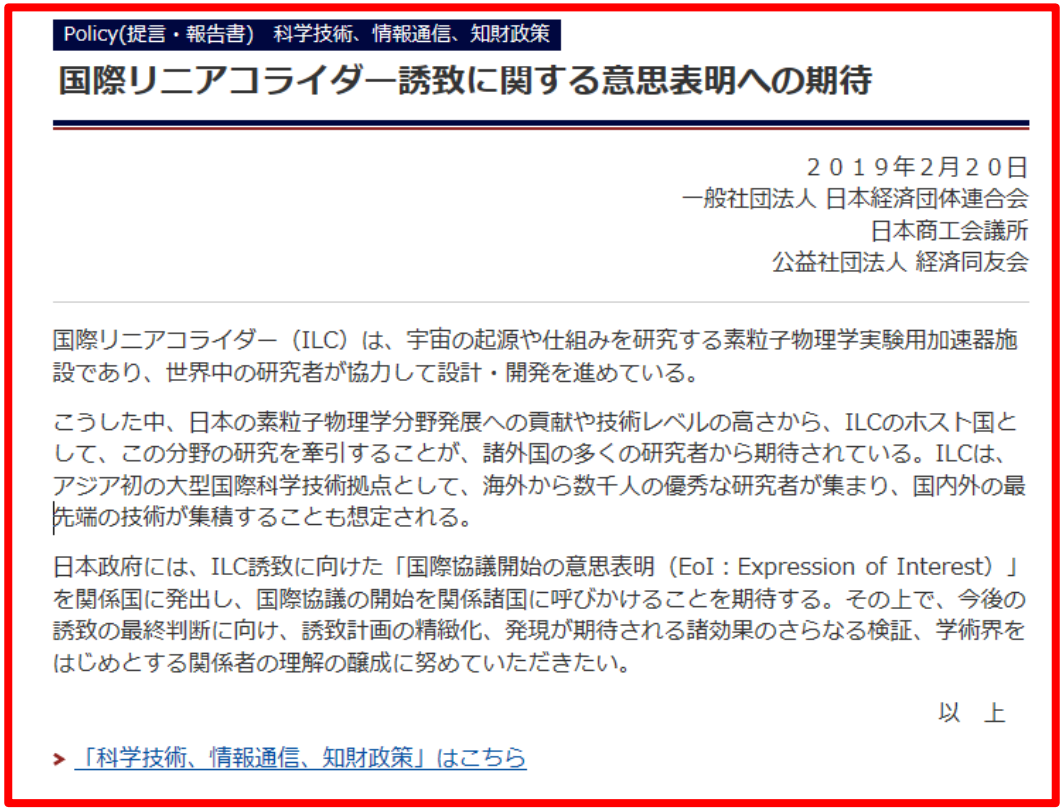
TCMB report

Shin MICHIZONO
KEK/Linear Collider Collaboration (LCC)

- *Recent news about the ILC*
- *European Strategy input (report at LCB/ICFA)*

Recommendations on the ILC from three economic parties (Feb.20,2019)

Expectations for manifestation of intention to attract international linear colliders
- Keidanren (Japan Business Federation)
- The Japan Chamber of Commerce and Industry
- Keizai Doyukai (Japan Association of Corporate Executives)



Policy(提言・報告書)　科学技術、情報通信、知財政策

国際リニアコライダー誘致に関する意思表明への期待

２０１９年２月２０日
一般社団法人 日本経済団体連合会
日本商工会議所
公益社団法人 経済同友会

国際リニアコライダー（ILC）は、宇宙の起源や仕組みを研究する素粒子物理学実験用加速器施設であり、世界中の研究者が協力して設計・開発を進めている。

こうした中、日本の素粒子物理学分野発展への貢献や技術レベルの高さから、ILCのホスト国として、この分野の研究を牽引することが、諸外国の多くの研究者から期待されている。ILCは、アジア初の大型国際科学技術拠点として、海外から数千人の優秀な研究者が集まり、国内外の最先端の技術が集積することも想定される。

日本政府には、ILC誘致に向けた「国際協議開始の意思表明（EoI：Expression of Interest）」を関係国に発出し、国際協議の開始を関係諸国に呼びかけることを期待する。その上で、今後の誘致の最終判断に向け、誘致計画の精緻化、発現が期待される諸効果のさらなる検証、学術界をはじめとする関係者の理解の醸成に努めていただきたい。

以　上

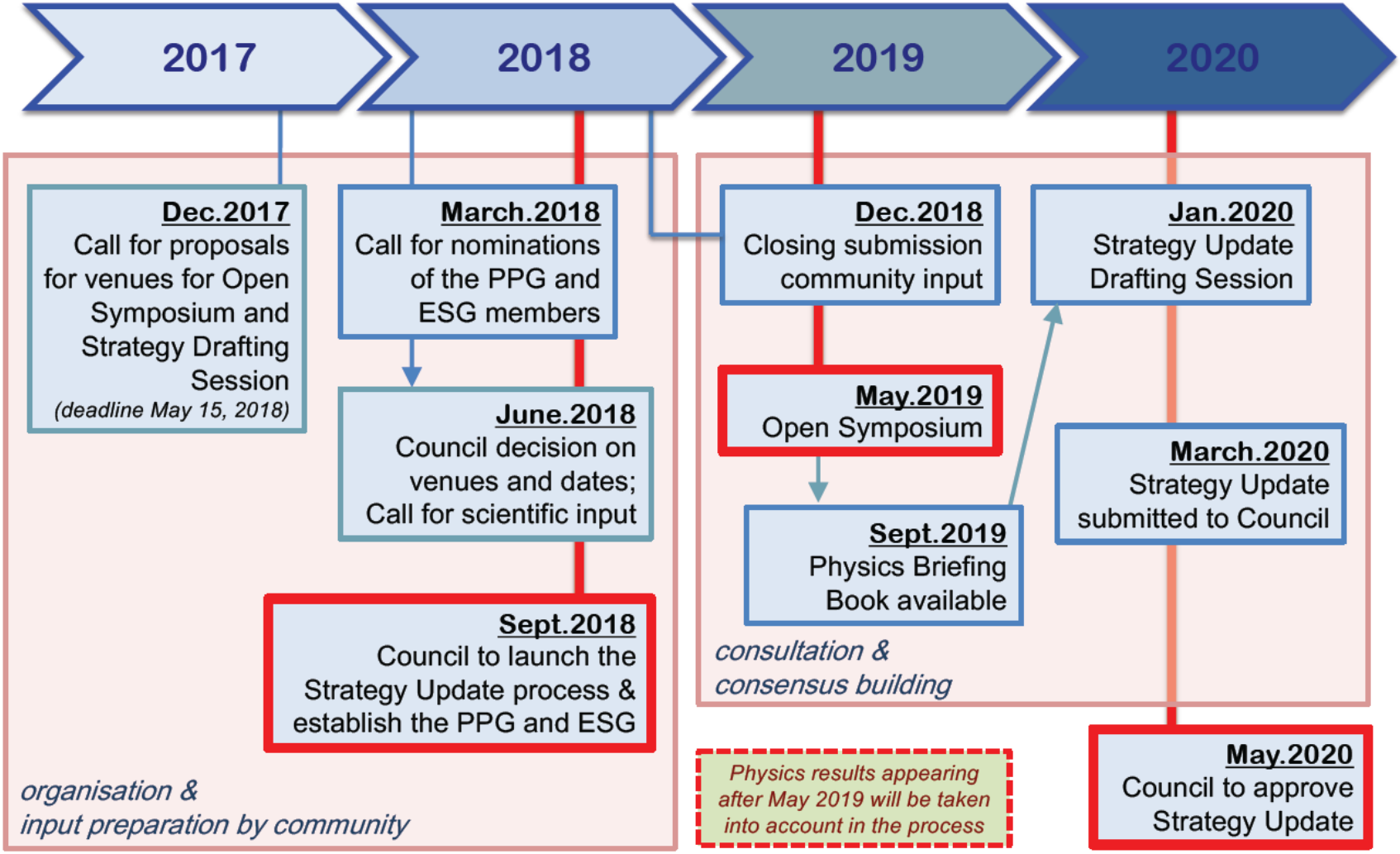
> 「科学技術、情報通信、知財政策」はこちら

Federation of Diet Members for the ILC (Feb.22,2019)

According to the Federation of diet members on Feb.22, MEXT will announce the government's "view" at ICFA on March 7.
It is expected to explain the idea of participating in discussions with overseas expecting construction in Japan while continuing discussion domestically about the pros and cons of attraction.

- It is foreseen that the Japanese Government will announce Japan's official position toward ILC at the LCB/ICFA meeting in March 2019 in Tokyo.
- ILC and ICFA will discuss their position concerning ILC in the update of the European Strategy for Particle Physics (ESPP).

European Particle Physics Strategy *Update*



Halina Abramowicz

ILC European Strategy documents

(1)ILC project overview

The International Linear Collider
A Global Project

Prepared by: Hiroaki Aihara[1], Jonathan Bagger[2], Philip Bambade[3], Barry Barish[4], Ties Behnke[5], Alain Bellerive[6], Mikael Berggren[5], James Brau[7], Martin Breidenbach[8], Ivanka Bozovic-Jelisavcic[9], Philip Burrows[10], Massimo Caccia[11], Paul Colas[12], Dmitri Denisov[13], Gerald Eigen[14], Lyn Evans[15], Angeles Faus-Golfe[3], Brian Foster[5,10], Keisuke Fujii[16], Juan Fuster[17], Frank Gaede[5], Jie Gao[18], Paul Grannis[19], Christophe Grojean[5], Andrew Hutton[20], Marek Idzik[21], Andrea Jeremie[22], Kiyotomo Kawagoe[23], Sachio Komamiya[1,24], Tadeusz Lesiak[25], Aharon Levy[26], Benno List[5], Jenny List[5], Shinichiro Michizono[16], Akiya Miyamoto[16], Joachim Mnich[5], Hugh Montgomery[20], Hitoshi Murayama[27], Olivier Napoly[12], Yasuhiro Okada[16], Carlo Pagani[28], Michael Peskin[8], Roman Poeschl[3], Francois Richard[3], Aidan Robson[29], Thomas Schoerner-Sadenius[5], Marcel Stanitzki[5], Steinar Stapnes[15], Jan Strube[7,30], Atsuto Suzuki[31], Junping Tian[1], Maksym Titov[12], Marcel Vos[17], Nicholas Walker[5], Hans Weise[5], Andrew White[32], Graham Wilson[33], Marc Winter[34], Sakue Yamada[1,16], Akira Yamamoto[16], Hitoshi Yamamoto[35] and Satoru Yamashita[1].

[17] *IFIC, U. Valencia-CSIC,* [18] *IHEP,* [19] *Stony Brook U.,*
[20] *Jefferson Lab,* [21] *AGH, Kraków,* [22] *LAPP/CNRS,*
[23] *Kyushu U.,* [24] *Waseda U.,* [25] *IFJPAN, Kraków,*
[26] *Tel Aviv U.,* [27] *U. California, Berkeley,* [28] *INFN,*
[29] *U. Glasgow,* [30] *PNNL,* [31] *Iwate Prefecture U.,* [32] *U. Texas, Arlington,* [33] *U. Kansas,* [34] *IPHC/CNRS,* [35] *U. Tohoku*

(*Representing the Linear Collider Collaboration and the global ILC community.*)

(2) European ILC project plans

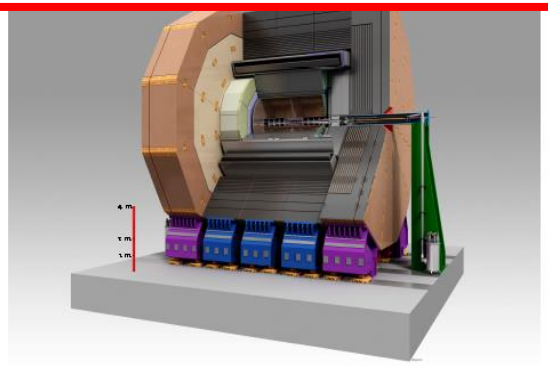
The International Linear Collider
A European Perspective

Prepared by: Philip Bambade[1], Ties Behnke[2], Mikael Berggren[2], Ivanka Bozovic-Jelisavcic[3], Philip Burrows[4], Massimo Caccia[5], Paul Colas[6], Gerald Eigen[7], Lyn Evans[8], Angeles Faus-Golfe[1], Brian Foster[2,4], Juan Fuster[9], Frank Gaede[2], Christophe Grojean[2], Marek Idzik[10], Andrea Jeremie[11], Tadeusz Lesiak[12], Aharon Levy[13], Benno List[2], Jenny List[2], Joachim Mnich[2], Olivier Napoly[6], Carlo Pagani[14], Roman Poeschl[1], Francois Richard[1], Aidan Robson[15], Thomas Schoerner-Sadenius[2], Marcel Stanitzki[2], Steinar Stapnes[8], Maksym Titov[6], Marcel Vos[9], Nicholas Walker[2], Hans Weise[2], Marc Winter[16].

[1] *LAL-Orsay/CNRS,* [2] *DESY,* [3] *INN VINCA, Belgrade,* [4] *Oxford U.,*
[5] *U. Insubria,* [6] *CEA/Irfu, U. Paris-Saclay,* [7] *U. Bergen,* [8] *CERN,* [9] *IFIC, U. Valencia-CSIC,* [10] *AGH, Kraków,* [11] *LAPP/CNRS,* [12] *IFJPAN, Kraków,* [13] *Tel Aviv U.,* [14] *INFN,* [15] *U. Glasgow,* [16] *IPHC/CNRS.*

https://ilchome.web.cern.ch/content/ilc-european-strategy-document

(3) ILD detector



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 3.5 T 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.

100 pager supporting document

The International Linear Collider
A Global Project[†]

Prepared by: Ties Behnke[1], Mikael Berggren[1], James Brau[2], Keisuke Fujii[3], Juan Fuster[4], Frank Gaede[1], Christophe Grojean[1], Benno List[1], Jenny List[1], Shinichiro Michizono[3], Akiya Miyamoto[3], Michael Peskin[5], Roman Poeschl[6], Frank Simon[7], Junping Tian[8], Marcel Vos[4], Andrew White[9], Graham Wilson[10] and Hitoshi Yamamoto[11]

[1] *DESY,* [2] *U. Oregon,* [3] *KEK,* [4] *IFIC, U. Valencia-CSIC,*
[5] *SLAC,* [6] *LAL-Orsay/CNRS,* [7] *Max Planck Munich,*
[8] *U. Tokyo,* [9] *U. Texas, Arlington,* [10] *U. Kansas,* [11] *U. Tohoku*

(Representing the Linear Collider Collaboration and the global ILC community.)
(Dated: February 20, 2019)

Input from the International Linear Collider community for the European Strategy Update: supplementary material

(1) ILC project overview

I. Introduction
II. Physics
III. Collider
IV. Detectors
    A. The full detector systems, ILD and SiD
    B. Detector R&D
V. Software and computing
VI. Discussion and summary

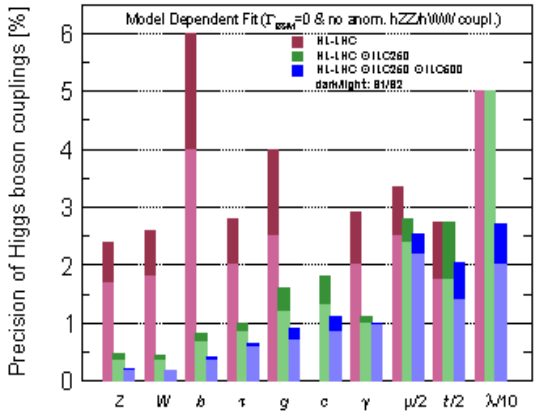


FIG. 1. Projected Higgs boson coupling uncertainties for the LHC and ILC using the model-dependent assumptions appropriate to the LHC Higgs coupling fit. The dark- and light-red bars represent the projections in the scenarios S1 and S2 presented in [9, 10]. The scenario S1 refers to analyses with

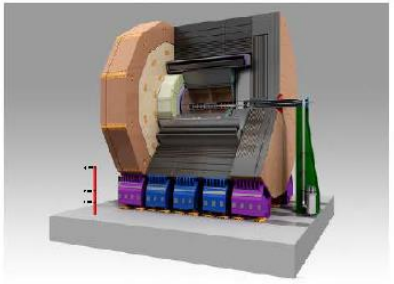


FIG. 4. The ILD detector concept.

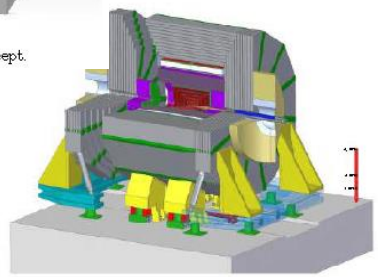


FIG. 5. The SiD detector concept.

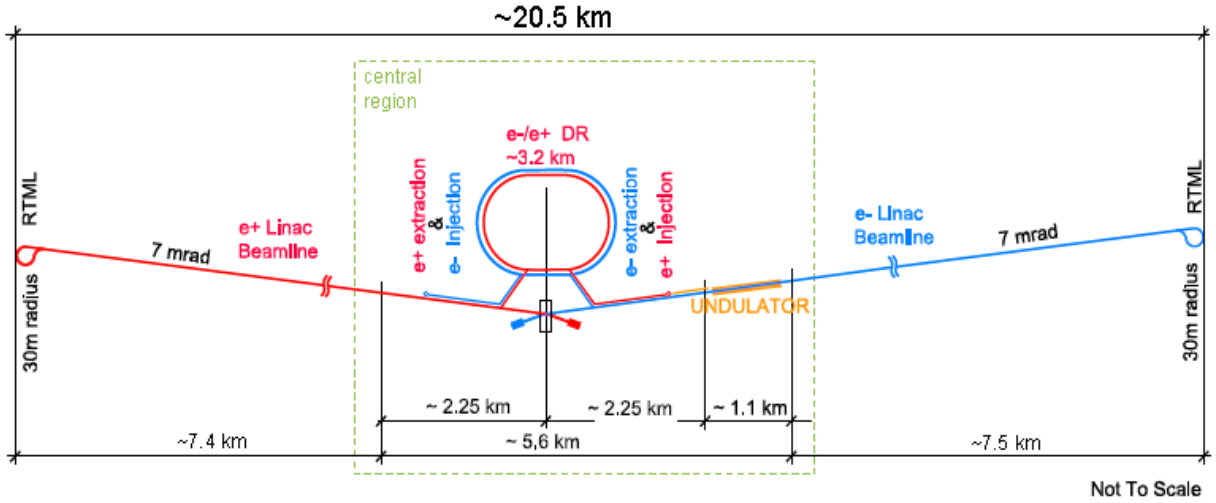


FIG. 3. Schematic layout of the ILC in the 250 GeV staged configuration.

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(2) European ILC project plans

I. Introduction
II. Accelerator
   A. ILC accelerator competence in Europe
   B. ILC accelerator Preparation Phase activities in Europe
   C. ILC accelerator in-kind contributions from Europe during the ILC Construction Phase
   D. Organisation of the accelerator activities

	Germany	France	Italy	Poland	Russia	Spain
Linac						
Cryomodules	✓	✓	✓	✓		
SCRF Cavities	✓		✓	✓		
Couplers and Tuners	✓	✓		✓		
Cold Vacuum	✓				✓	
Cavity String Assembly	✓	✓				
SC Magnets	✓			✓		✓
Infrastructure						
Accelerator Module Test Facility (AMTF)	✓			✓	✓	
Cryogenics	✓					
Sites & Buildings						
AMTF hall	✓					

TABLE I. Responsibility matrix for cryomodule production and testing for the European XFEL. More details and a similar matrix can be found in [2] concerning construction of SCRF modules for the ESS linac.

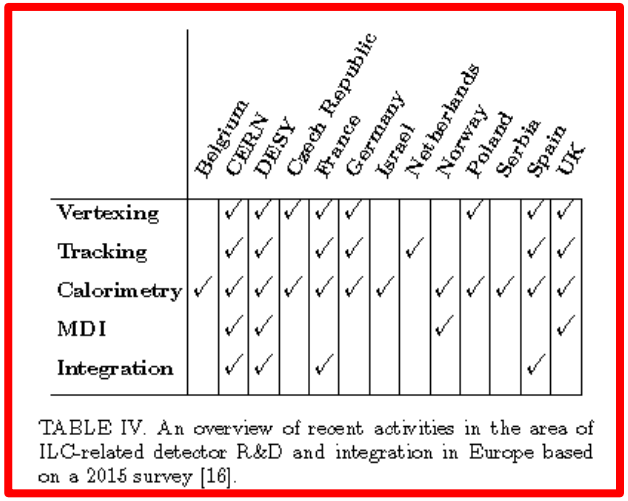
	SCRF	HLRF	Sources	Damping Rings	Instru-mentation	Beam Dynamics	Beam Delivery System	Cryogenics
CERN		C,O	O	G,C,O	C,G	C,G	C,G	O
France	X,E,G		G		A,G	G	C,G	
Germany	X,G	X	G	G	X	G		X,O
Italy	X,E,G			G				
Poland	X,E		O		E,O			X,E,O
Russia	X		G					
Spain	X,E				A		C,G	
Sweden	E						G	
Switzerland					X,C			
UK	E		G	G	A,C,G	C,G,A	C,G,A	

TABLE III. European expertise relevant for ILC accelerator construction, based on experience in the recent past. This is based on two major construction projects, the E-XFEL (X) and the ESS (E), several more R&D oriented efforts namely the GDE/LCC (G), ATF-2 (A), CLIC (C) and experience in other accelerator projects (O)

(2) European ILC project plans

III. Detectors
  A. ILC detector competence in Europe
  B. ILC Detector preparation phase activities in Europe
  C. Estimation of a European in-kind contribution to the ILC detectors
  D. Organisation of the detector activities

IV. Discussion
  A. Political synergy between Japan and Europe
  B. Organization of an European contribution
  C. Leveraging the expertise and the production capabilities of European industry
  D. Conclusion

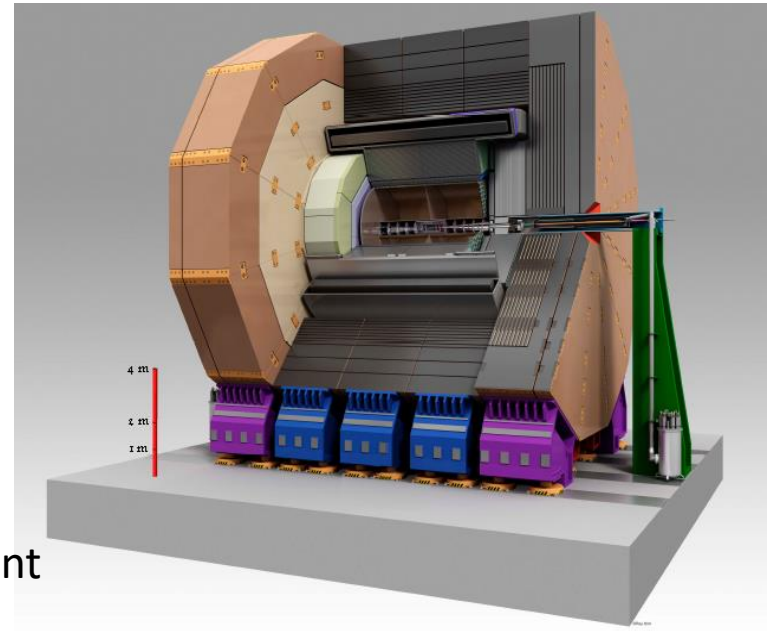


	Belgium	CERN	DESY	Czech Republic	France	Germany	Israel	Netherlands	Norway	Poland	Serbia	Spain	UK
Vertexing		✓	✓	✓	✓	✓			✓		✓	✓	
Tracking		✓	✓		✓	✓		✓			✓	✓	
Calorimetry	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
MDI		✓	✓						✓				✓
Integration		✓	✓		✓							✓	

TABLE IV. An overview of recent activities in the area of ILC-related detector R&D and integration in Europe based on a 2015 survey [16].

(3) ILD detector

I. Introduction
II. The ILD Detector Design: Requirements
III. Implementation of the ILD Detector
    A. Vertexing System
    B. Tracking System
    C. Calorimeter System
    D. The Forward System
    E. Detector Integration and Costing
IV. Science with ILD
V. Integration of ILD into the Experimental Environment
VI. The ILD Concept Group
VII. Conclusion and Outlook



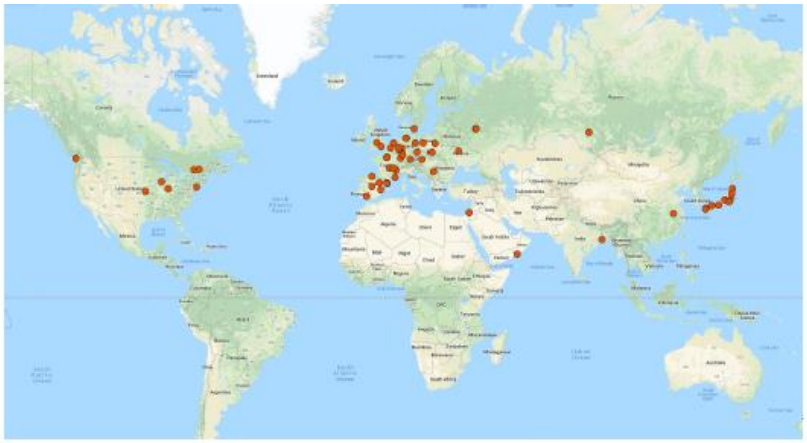


FIG. 5. Map with the location of the ILD member institutes indicated.

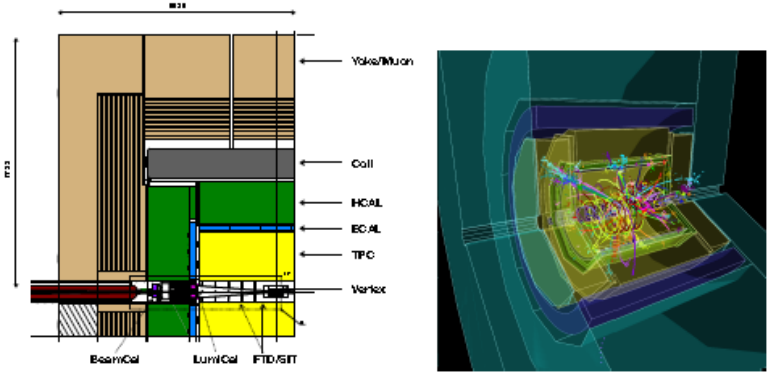


FIG. 1. Left: Single quadrant view of the ILD detector. Right: Event display of a simulated hadronic decay of a $t\bar{t}$ event in ILD. the colouring of the tracks show the results of the reconstruction, each colour corresponding to a reconstructed particle.

Supporting document for European Strategy input

100 pager document

Other supporting documents: TDRs documents, ILC 250 machine (arXiv:1711.00568) , ILC 250 physics (arXiv:1707621), SID and ILD detailed baseline designs, R&D document in preparation …

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