KEK
High Energy Accelerator Research Organization

ILC project Status

Yasuhiro Okada (KEK)

ILC detector meeting

March 30, 2017, at KEK, Japan

Contents of this talk

- Cover mostly recent developments after my presentation in the previous meeting in September 29,2016. https://kds.kek.jp/indico/event/22152/

DOE-MEXT discussion group and cost reduction R&D
Start of discussions on the staging scenario in the worldwide HEP community
ILC Panel in MEXT
KEK's efforts

KEK
High Energy Accelerator Research Organization

Recent Developments on Promotion of the ILC Project in Japan

- October 2012: Japanese HEP community proposed to host the ILC in Japan as a global project. "A Proposal for a Phased Execution of the ILC"
- Statements on ILC hosted in Japan
  The European Strategy for Particle Physics Update 2013
  ACFA/AsiaHEP Statement on the ILC (September 2013)
  P5 report (May 2014)
  ICFA statements (January and July 2014)
- September 2013: Science Council of Japan (SCJ) sent Report on the ILC Project to MEXT.
- May 2014: MEXT set up ILC Advisory Panel.
- After the 4th meeting in June 2015, ILC Advisory Panel disclosed "Summary of ILC Advisory Panel's Discussions to Date" in August 2015.
- In the recent meeting on February 1, 2017, the US-Japan cost reduction R&D and the HEP community's discussion on the staging scenario were reported.

KEK
High Energy Accelerator Research Organization

MEXT-DOE Discussion Group

- ✓ After the 4th visit by Japanese Diet members to Washington in February 2016, a follow-up meeting was set up between DOE and MEXT.
- ✓ High level officers from MEXT visited their counterpart in DOE at the end of May, and it was agreed to start the US-Japan discussion group co-chaired by Director, Office of Science, DOE and a corresponding level of officer at MEXT.
- ✓ Agenda of the discussion
  - Issues to be cleared
  - Possibilities of collaborative research for cost reduction
  - … etc.
- ✓ Meetings will be held every 2-3 months.

MEXT-DOE meeting on August 8, 2016 during ICHEP 2016

- ✓ KEK-DG and FNAL Director were invited to the meeting to propose cooperative R&D for cost reduction.

2nd MEXT-DOE Discussion Group Meeting in October, 2016

- ✓ MEXT and DOE agreed to start collaborative research for ILC cost reduction.

KEK
High Energy Accelerator Research Organization

US-Japan cooperative R&D for ILC cost reduction

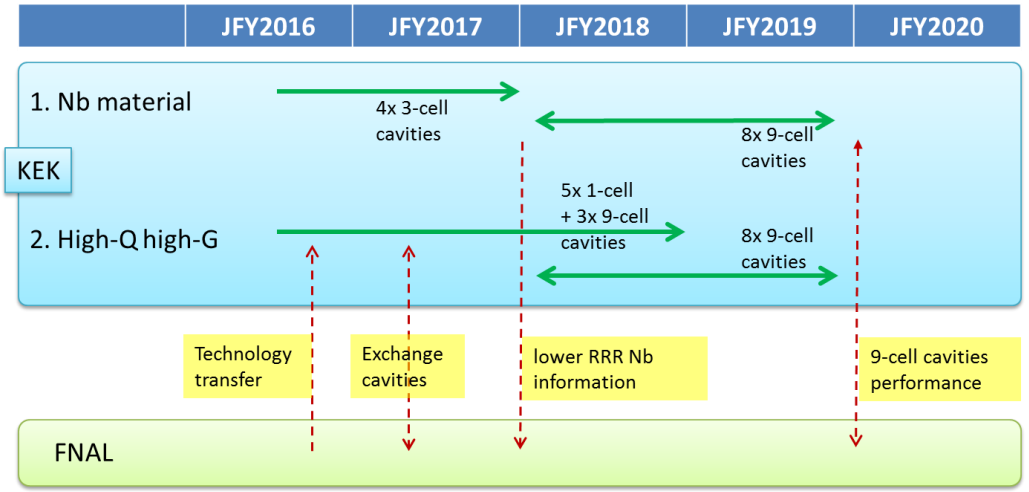
We use the existing framework of the US-Japan cooperation in HEP which started in 1979.

Singing of a new Project Arrangement concerning HEP between DOE and KEK, October 2015 at US embassy in Tokyo

Plan of cooperative R&D

1. Cost reduction in Nb material preparation
2. High-Q high-gradient SRC with nitrogen infusion

Aim to 10-12 % reduction of the ILC total accelerator construction cost.



LCWS 2016, Morioka, December 5-9, 2016

http://lcws2016.sgk.iwate-u.ac.jp/Welcome.html

The number of the participants is over 300.

The speech by Hon. Takeo Kawamura, Chair of Federation of Diet Members for the ILC, was very encouraging : “SCIENCE FIRST”.

Visit to Ohara Civic Center in Ichinoseki city

KEK
High Energy Accelerator Research Organization

Discussion on a staging scenario of the ILC

- In LCWS 2016, Morioka, November 2016, we agreed to start considering a staging scenario of the ILC seriously.

  Reduce the initial construction cost significantly.
  Focus on the Higgs Factory first.
  Take advantage of “Linear Machine” that has a flexible energy extendibility.

- LCB/LCC will work on a possible scenario of ILC staging to build consensus among the worldwide HEP community.

  Initial energy and a staging scenario
  Cost
  Impacts on physics

- Japanese HEP community (JAHEP) is investigating physics case of the ILC as a Higgs factory and preparing a statement.

ILC Advisory Panel in MEXT

KEK
High Energy Accelerator Research Organization

1st survey of technological spin-offs and Research trends (FY2014)
2nd survey of technology issues (FY2015)

Research contract

MEXT

Under ILC TF headed by State Minister of MEXT

ILC Advisory Panel

Established in May 2014

Particle and Nuclear Physics Working Group	**TDR Validation Working Group**	**Human Resources Working Group**	**Organization and management Working Group**
Established in June 2014	Established in June 2014	Established in Nov. 2015	Established in Feb 2017

- Special Committee investigates critical issues required to judge hosting ILC.
- ILC Advisory Panel's Summary (Aug 2015)
- "Report on measures to secure and develop human resources for the ILC" (July 2016)
- A new WG to investigate organizational and management issues was recently set up (Feb 2017).

KEK
High Energy Accelerator Research Organization

6th Meeting on February 1, 2017

- Report on US-Japan collaboration on ILC cost reduction R&D
- Report on LCWS 2016 at Morioka, December 2016
- Setup of a new WG on organization and management

1st Meeting of the WG on organization and management

March 9, 2017

Report on existing documents concerning this issue by the HEP community.
Project Design Guideline towards the ILC (ICFA)
KEK-ILC Action Plan
Project Implementation Planning (PIP) (GDE, LCB)

The WG is expected to be concluded in July 2017.

KEK
High Energy Accelerator Research Organization

Interim Report from the ILC Panel

Summer 2015

- Recommendation 1: "The ILC project requires huge investment that is so huge that a single country cannot cover, thus it is indispensable to share the cost internationally. From the viewpoint that the huge investments in new science projects must be weighed based upon the scientific merit of the project**,** a clear vision on the discovery potential of new particles as well as that of precision measurements of the Higgs boson and the top quark has to be shown so as to bring about novel development that goes beyond the Standard Model of the particle physics."
- Recommendation 2: "Since the specifications of the performance and the scientific achievements of the ILC are considered to be designed based on the results of LHC experiments, which are planned to be executed through the end of 2017, it is necessary to closely monitor, analyze and examine the development of LHC experiments. Furthermore, it is necessary to clarify how to solve technical issues and how to mitigate cost risk associated with the project."
- Recommendation 3: "While presenting the total project plan, including not only the plan for the accelerator and related facilities but also the plan for other infrastructure as well as efforts pointed out in Recommendations 1 & 2, it is important to have general understanding on the project by the public and science communities."

http://www.mext.go.jp/component/b_menu/shingi/toushin/__icsFiles/afieldfile/2015/08/05/1360596_3.pdf

FALC , February 15,2017, Valencia

- MEXT reported on the ILC Advisory Panel and US-Japan Discussion Group in the meeting of Funding Agencies for Large Colliders (FALC) held at IFIC, Valencia on February 15, 21007.
- KEK DG Yamauchi reported a proposed collaboration on ILC cost reduction R&D between KEK and Fermlab.
- ICFA chair Joachim Mnich reported the new mandate of LCC /LCB and discussion of staging by LCC/LCB.

KEK's plan for the ILC

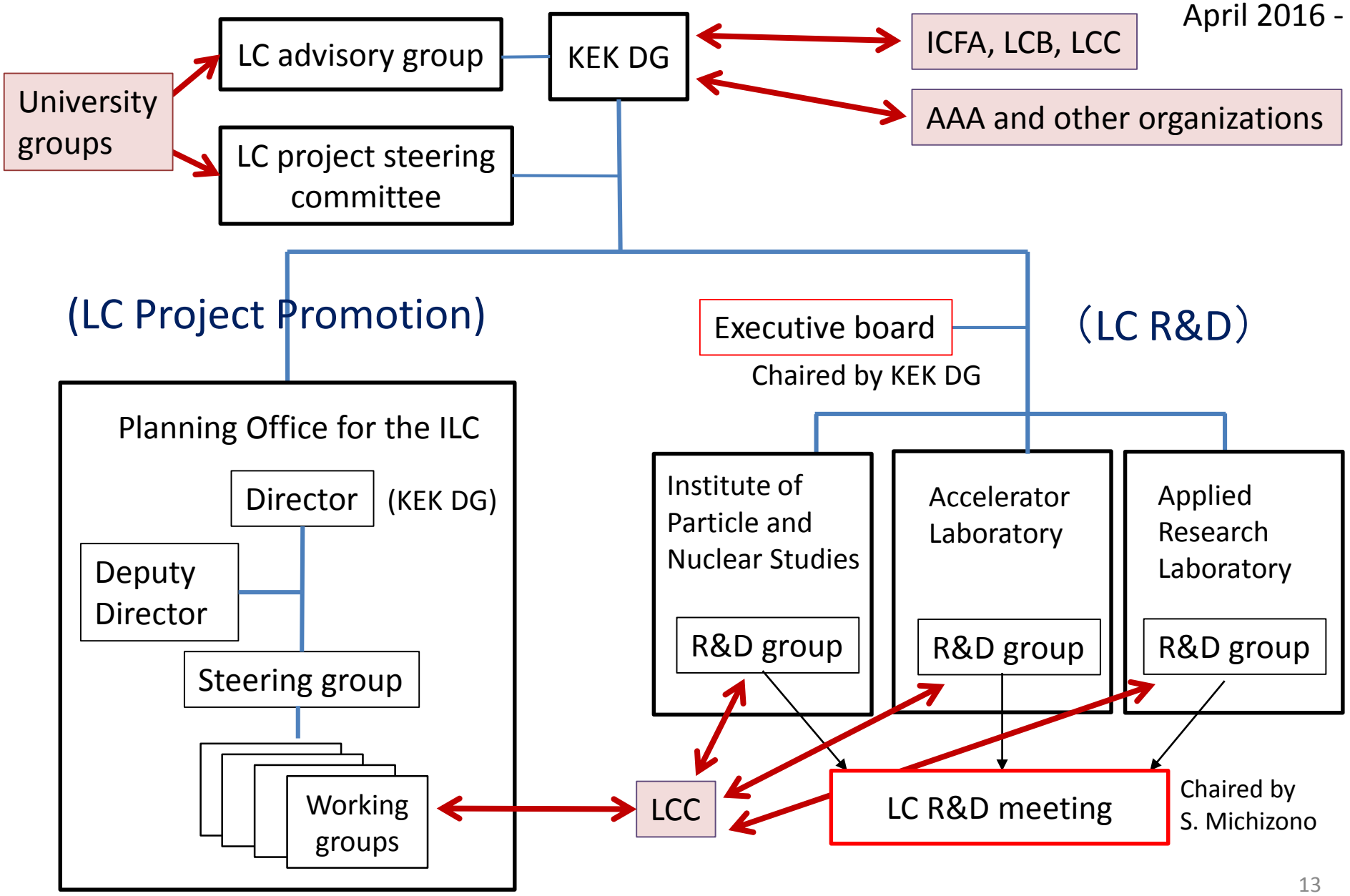
KEK will

- continue accelerator R&D program at ATF, STF and CFF facilities collaborating with the international team.
- provide the ILC Advisory Panel with appropriate information to help their timely conclusion.
- develop our Acton Plan to prepare for green light given by MEXT.
- intend to facilitate discussions between governments and physics communities.

KEK
High Energy Accelerator Research Organization

Reformation of ILC R&D and project promotion at KEK

April 2016 -



WG activities

WG's in the Planning Office for the ILC

WG1 PR for general public
WG2 Communications in HEP and close fields
WG3 Impacts to others
WG4 Nuclear physics research at ILC
WG5 Follow-up on the KEK-ILC Action Plan
WG6 Explanation of physics at the ILC

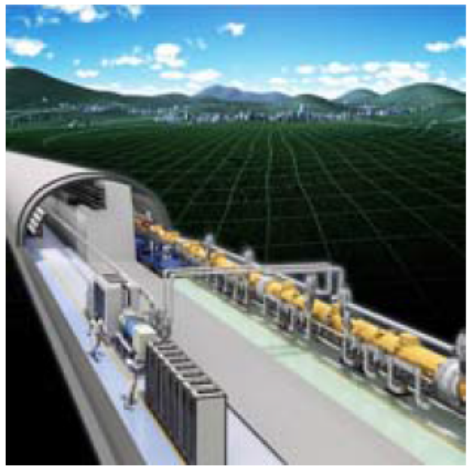
WG3 produced a report on technological impact of the ILC.
We are now preparing a KEK ILC booklet including outcomes of WG3 and WG6.
KEK has started a fund raising campaign to support PR activities of the ILC project.

KEK
High Energy Accelerator Research Organization

Fund raising campaign for the ILC

③国際リニアコライダー（ILC）理解増進のための寄附金

理解増進　～ILC計画をより知って頂くために



KEKは、加速器科学の世界三大拠点の一つとして、国際協力での様々な研究推進に貢献しています。その一つが国際リニアコライダー（ILC）計画です。ILCは、宇宙誕生直後の現象を徹底的に研究し未知の物理法則の解明を目指す次世代加速器計画です。世界中の研究者の総力を挙げて成す研究施設となるため、世界に一つだけ建設することが計画されています。KEKでは、ILC計画の意義を広くご理解頂くために、この度寄附金を募集することに致しました。何とぞ趣旨にご賛同いただき、皆様からの温かなご支援とご協力を賜りますよう、よろしくお願い申し上げます。

詳しくは、こちらから

Please visit
http://www2.kek.jp/ilc/ja/contents/contribution/index.html

KEK-ILC Action Plan and European Action Plan (EAP) for the ILC

KEK-ILC Action Plan

http://www.kek.jp/en/NewsRoom/Release/KEK-ILC_ActionPlan_160106-EN.pdf

KEK-ILC Action Plan was released in January 2016. It contains technical preparation tasks and a human resource development plan for the pre-preparation phase (current efforts) and the main-preparation phase (after "green sign" from MEXT). It focuses mainly on a development plan for KEK.

We have agreed to produce an EPA for the ILC with European colleagues.

- ✓ After having established a discussion group with DOE, discussions with Europe are likely to become the next important topic for MEXT. MEXT is closely monitoring ILC-related activities and EAP is yet another evidence of the European interest in the project.
- ✓ Using an existing EU-Japan cooperation framework under Horizon 2020 (E-JADE), we are working for EPA with European colleagues, which will be completed by he end of May 2017.
- ✓ EAP is a step towards the Worldwide Action Plan for the ILC and will be an important input to the next European Strategy for Particle Physics.

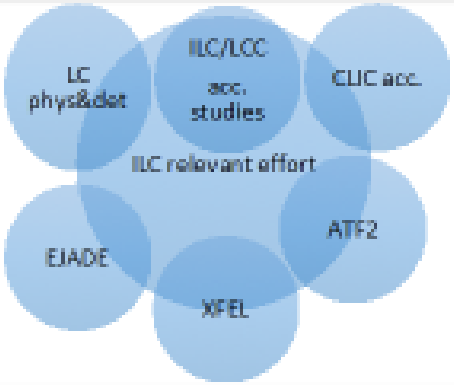
European Action Plan (EAP) for the ILC

ILC Action Plan

Okada:

"Producing a EAP (European Action Plan) for the ILC in timely manner is very important.

After having established a discussion group with DOE, discussions with Europe are likely to become the next important topic for MEXT. MEXT is closely monitoring ILC-related activities and EAP is yet another evidence of the European interest in the project."



EJADE participants:
CERN; Stapnes (scient coord)
CEA: Napoli, DESY: Walker
CNRS: Bambade/Jeremi
UK: Burrows, CSIC: Faus-Golfe
EJADE WP3 and centrally: Schoerner-Sadenius, Stanitzki
LCC: Foster
One addition so far not in EJADE: INFN Zoccoli
Reps from KEK

Preparing a European Plan for next phases (assuming Green Light in Japan):
Currently: several existing activities with relevance for ILC (mainly funded for other reasons) – see figure on the left
2019-2022: Preparatory phase (main focus of document)
2023- : Construction phase
Will use EJADE WP3 as framework for this and gradually include more participants in the discussion (this approach is agreed with LCC)

Will also – with this work – attempt to provide important **input to European Strategy " 2019** concerning capabilities, resources, timelines, etc

Work started in October, complete in 2017

Steinar Stapnes, CERN 10

Lyn Evans, LCWS2016, Morioka

KEK
High Energy Accelerator Research Organization

On-going efforts in/with Europe

- A new ILC Director Shin Michizono (also ILC R&D project leader at KEK) under LCC Director Lyn Evans has start talking with European institutes to coordinate R&D and design efforts in/with Europe.
- Two Diet members and Mr. Takashi Nishioka, President of AAA and Former CEO of Mitsubishi Heavy Industries, visited Strasbourg to attend the Grand Opening Ceremony and the VIP session of the 2016 IEEE NSS/MIC Symposium on October 31, 2016. This was a good opportunity to inform wider audience than the HEP community of the ILC project. (Discussion on how to approach the ESFRI process)
- Satoru Yamashita and I visited several institutions in Europe to share information on the ILC status in Japan and exchange opinions on how to proceed in February 2017. It was extremely useful visit.

  DESY, CERN, INFN, irfu, IN2P3, MICINN(Spain), CIEMAT

KEK
High Energy Accelerator Research Organization

Recent Progress in the political/governmental sector

- **US-Japan joint discussion group**: cost reduction study started
- **Progress in Europe & Asia**: political interactions
  - **Spain-Japan** (May-Jun.): Industry-Industry interaction, MoU between INEUSTAR and AAA
  - **Germany-Japan** (Oct): parliamentary member interactions@Tokyo

  Direct discussion for ILC between German Parliament Member and JP Diet members
  - **Europe-Japan & France-Japan** (Oct.): parliament & industry members interactions, IEEE@Strasbourg → create an entrance window to EU / France politics
  - **India-Japan** (Oct.): Parliamentary member interactions, IPU@Geneva, Inter-University organization in formation (Japan: A. Suzuki)

Summary

- The next 1.5 years are the critical time to realize the ILC in Japan.