

# Status and Activities of the International Development Team (IDT)

LCWS2023 at SLAC

Menlo Park, USA, 15-19 May 2023

Tatsuya Nakada

EPFL, Switzerland

Chair of the IDT Executive Board

# Contents

1. Introduction
2. Global project
3. ILC as a global project
4. Moving forward: IDT initiatives
5. Overall ILC timeline
6. Final remarks

# 1) Introduction

The IDT was established by ICFA in August 2020 to support the Japanese HEP community, who had proposed to host the ILC in Japan as a global project, with a mandate to pave a way for the preparatory phase of the ILC construction. During the preparatory phase, technical work resulting in the Engineering Design Report (including civil construction) and intergovernmental negotiation on the sharing of cost and responsibilities for the construction, operation and decommissioning, as well as the organization and governance model for the ILC Laboratory should take place.

The IDT produced a proposal for the ILC Preparatory Laboratory (Pre-lab) for the technical work during the preparatory phase:

- a laboratory based on the cooperation among worldwide national and intergovernmental laboratories, with its headquarters in Japan.

and indicated

- the importance of the Japanese government to express its interest to host the ILC that should trigger the start of the Preparatory Phase.

# 1) Introduction

After MEXT concluded that “**approval of the Pre-lab could only be made once the prospect for foreign contributions to the ILC would be clarified**”, the IDT made in depth analysis for the cause of the long lasting “**chicken and egg**” problem, i.e. a better understanding of a global project

The IDT also took a particular note on some of the **recommendations by the MEXT ILC Advisory Panel**

- to put the hosting issue aside for the moment and **continue with the accelerator R&D work**
- to have an **environment for intergovernmental discussions** among the potential partners.

and developed the next step, i.e.

- **ILC Technology Network (ITN)** and **IDT International Expert Panel (IEP)**,

Which was agreed by ICFA

## 2) Global project

**Global project:** Starts and evolves as a collaborative project of partner countries who make **collective decisions on all aspects of the project**, such as the scheme for cost and responsibility sharing, project organisation, and host and site location. The **ownership is shared among the partners**. ITER (an example of top down approach) and SKA (an example of bottom up approach) are examples of large global projects, while **HEP projects to date have been international projects**.

**International project:** Initiated as **a project of a laboratory with a limited international participation**, a total of  $O(10\sim 20\%)$  of the accelerator, like HERA (started as a DESY project) and LHC (started as a CERN project). This fraction may become larger but the ultimate ownership remains with the initiator.

*NB: Implementation of ITER is not necessarily judged as a success, but they succeeded to start as a global project.*

### 3) ILC as a global project

Technical work of ILC has already advanced to a **post-TDR stage** by the global effort under the GDE guidance. Meanwhile, there has been **no regular discussion among the partner government authorities** to drive the project forward politically, apart from exchanging “information” at FALC meetings. For this reason, there has been little advance in realisation of ILC as a global project.

For both **ITER and SKA**, the government authorities of partner countries had **regular interactions and drove the political side of the progress**, including site and host decision, **in parallel** with the technical development made by the community.

Japanese HEP community sought the government to declare its interest to host, supported by some Diet members. The government expressed **its interest in ILC (2019)**, however considers that the **decision of the host/site should be made through discussion among the partner countries** as the evolution process of a global project.

## 4) Moving forward toward Preparatory Phase

The following key issues must be be addressed in order to move forward:

- Resources are needed to move forward with technical work for engineering studies.
- Opportunities are needed to revitalise discussion of government authorities, supported by the community, on how to realise the ILC as a global project.

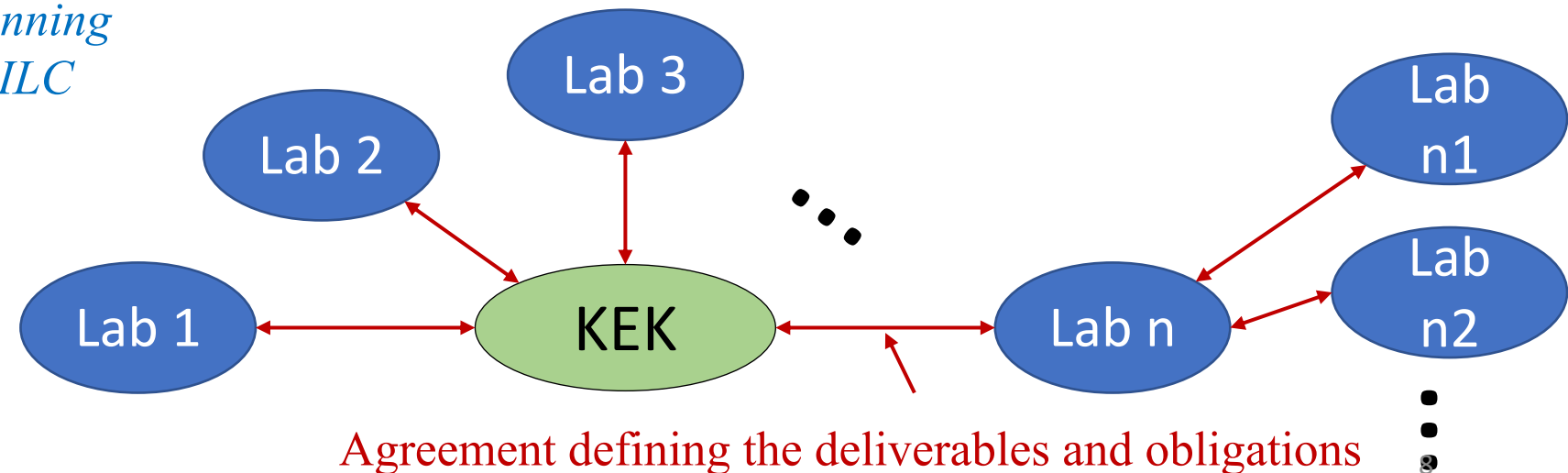
## 4) Moving forward toward Preparatory Phase

Move forward with engineering study, benefiting from the fact that:

- Pre-lab proposal identified the **necessary technical preparations** for ILC construction
- Many of the identified topics are in line with **broader interests in accelerator R&D**
- Increased Japanese budget for the ILC related technology R&D provides **a seed for required resources**

ILC Technology Network (ITN), based on **bilateral agreements between KEK and partner laboratories worldwide**, has been launched **to execute important work packages**, based on its own organisation. (See also presentations by S. Michizono and S. Asai)

*NB: IDT-WG2 will continue planning and overall coordination of the ILC accelerator development,*





## 4) Moving forward toward Preparatory Phase

Move forward with **the political process for**

- **Establishing regular interactions** among partner government authorities.
- **Developing a common view** on how to proceed with a global project, applicable to ILC.

A forum of government authorities/agencies of ITN participating laboratories is being setup (invitation by KEK), where the **IDT International Expert Panel** can interact with the forum participants **to foster common discussion and understanding on the ILC as a global project** among the participants.

Int. Expert Panel members (Chaired by the IDT EB Chair)

Ursula Bassler	(FR)	Philip Burrows	(GB)
Beate Heinemann	(DE)	Stuart Henderson	(US, ICFA Chair)
Karl Jakobs	(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)

# 5) Overall ILC timeline

-success oriented and assuming no major incident-

**Technology Network Phase**

**Preparatory Phase**

**Construction Phase**

**~10 years for the construction and commissioning**



R&D and effort to gain a common view and understanding.

ILC preparation laboratory and intergovernmental discussion/negotiation

- Technology Network Phase responds to the recommendations by the MEXT Expert Panel.
- ITN work packages are two to **four years**.
- MEXT funding programme for ILC-accelerator R&D is planned for five years.
- For **entering the Preparatory Phase**, interested government authorities, **not only Japanese but also European and US**, must become **ready to discuss ILC specific matters**.
- Given ITN, the **Preparatory Phase could be less than the four years** in the Pre-lab proposal for the accelerator and site-related work.
- **P5 discussion** in the U.S. and **FCC Feasibility Study** at CERN will impact the timeline.

## 6) Final remarks

- For a short moment in 90's, four high energy colliders were running in parallel: HERA, LEP, TEVATRON and TRISTAN. For recent years, LHC has been the only high energy collider in the world. **For the future**, i.e. a Higgs factory and beyond, given the cost and growing challenges for large infrastructure in general, **a truly global thinking would be needed.**
- **ILC is very attractive as a global Higgs factory;**
  - Thanks to the GDE effort, ILC is technically mature and ready to proceed to construction.
  - As a global project, ILC cost is affordable.
  - ILC power consumption and environmental impact is modest.
  - ILC has a clear upgrade path to higher energies: to t.t-bar threshold, to ZHH, to  $\sim 1$  TeV (and possibly beyond with technological advancement, when physics justifies).
  - ILC has been developed as a global project from its conception.

## 6) Final remarks

- IDT has put forward **a plan** to progress in **three to four years** to start the **Preparatory Phase** for ILC realisation
- In the meantime, the ILC Technology Network ensures that ILC will remain at the technological forefront among Higgs factory candidates. **Worldwide participation in the ITN is crucial.**
- As a global project, ILC is everybody's project. While we hope the success of **Japanese colleagues persuading the government**, we should **interact with our own governments** to pursue the ILC as a global project.