

22 September 2021

ILC  
International Development Team  
and  
European position towards the ILC

Summer camp on ILC  
Remote meeting  
21-24 September 2021

Tatsuya NAKADA  
EPFL (Swiss Federal Institute of Technology Lausanne)  
ILC International Development Team, Executive Board Chair

## *IDT: reminder for how it happened*

- In February 2020 ICFA/LCB meeting at SLAC:  
after the presentations by  
Mr. H. Masuko, Deputy-Director General, MEXT Research Promotion Bureau  
Hon. T. Kawamura, Chairperson of the Federation of Diet Members for the ILC  
ICFA **asked the LCB to propose a way to move to the preparatory phase for the ILC** to be constructed in Japan.
- LCB worked out a proposal to setup **the International Development Team (IDT)**, with KEK as the host, to pave a way to establish the ILC Pre-laboratory.
- In June 2020, LCB/LCC ended their terms defined by the ICFA.
- In August 2020 ICFA meeting  
ICFA setup the **ILC IDT and appointed the members of the Executive Board**, with an aim to establish the ILC Pre-lab within ~1.5 year.
- Since then,  
the IDT Executive Board has started working.

## *Reminder for ICFA mandate for the IDT*

- Clarifying the function and organisation of the ILC Pre-Lab based on the KEK International Working Group report,
- Developing a common understanding for the condition to start the ILC Pre-Lab,
- Providing an international framework for the ILC accelerator effort and coordinating further R&D and engineering design work for the ILC in order to sustain the community effort and to guarantee a smooth transition to the ILC Pre-Lab phase,
- Providing an international framework for the ILC physics and detector activities and coordinating physics and detector R&D effort in order to sustain the community effort and guarantee a smooth transition to the ILC Pre-Lab phase,
- Discussing with international partners (e.g. universities, national and regional laboratories) for resources needed for the ILC Pre-Lab, and
- Providing necessary information to the national authorities to support their discussion of the establishment of the ILC Pre-Lab.

# *Reminder for IDT organisation*

ICFA

## ILC-IDT

### Executive Board

Andrew Lankford (UC Irvine): Americas Liaison

Shinichiro Michizono (KEK): Working group 2 Chair

Hitoshi Murayama (UC Berkeley/U. Tokyo): Working group 3 Chair

Tatsuya Nakada (EPFL): Executive Board Chair and Working group 1 Chair

Yasuhiro Okada (KEK): KEK Liaison

Steinar Stapnes (CERN): Europe Liaison

Geoffrey Taylor (U. Melbourne): Asia-Pacific Liaison

Working group 1  
Pre-lab set-up

Working group 2  
Accelerator

Working group 3  
Physics & Detectors

**Scientific secretary: Wataru Ootani (Uni. Tokyo)**

**Communication team led by Rika Takahashi (KEK)**

Unlike LCB/LCC, **ILC-IDT is focused on the ILC.**

KEK provides administrative, logistic and some financial support.

## *IDT Recent activities*

- Completed the Pre-lab Proposal
- Communication team is working: e.g., (almost) monthly ILC Newsline and discussion on other activities on going, outreach events, ....
- WG1 liaison with national laboratories and authorities.
- WG2 sub-group regular meetings.
  - SRF
  - Source
  - Damping ring, Beam delivery and Beam dump
  - Civil engineering
- WG3 organising workshop (ILCX2021) and sub-group regular meetings
  - Machine-Detector Interface Subgroup
  - Detector and Technology R&D Subgroup
  - Software and Computing
  - Physics Potential and Opportunities
- Preparing for the interaction with the MEXT Panel

## *IDT work plan for the coming days*

- IDT is now **ready to start discussion with laboratories**
  - to identify matching between the work packages and **interest and expertise of laboratories**.
  - to understand conditions where the laboratory **could consider to signup for a work packages**.
- Further develop the governance model and organisational structure reflecting the political development
- Explore ways to **start the Pre-lab**
- Keep **stimulating the physics community** through promoting new physics ideas and facilitating common effort.

NB: It is planned that the progress will be assessed by the ICFA in March 2022.

## *Pre-lab and ILC Preparatory phase (I)*

- **Goal** of the preparatory phase
  - complete technical description for the accelerator, civil construction and infrastructure, (**technical/engineering work**)
  - reach international agreement for the organisation, governance and sharing of cost and responsibility for the ILC construction and operation, (**intergovernmental discussion/negotiation**)

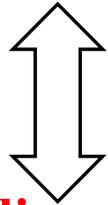
**in order to start the ILC Laboratory.**
- Preparatory phase will also
  - **validate the model for the ILC construction** as much as possible:  
cost and responsibility sharing, in-kind contribution, ...
  - **build up confidence in the ILC project planning:**  
technology, cost, expertise, international partnership, ...

## *Pre-lab and ILC Preparatory phase (II)*

- During the preparatory phase,

### **Technical/engineering work**

- reliable resource estimation for the construction and operation
- validation of technical expertise of the collaborating laboratories



### **Intergovernmental discussion/negotiation**

- confidence in collaborative work

**two processes need to proceed in parallel** for timely realisation.

- For technical/engineering work → ILC Pre-lab as an international community proposal (IDT)

## *Pre-lab Proposal contents*

- Organisational structure and governance model
- Possible legal structure and Pre-lab start-up scenario
- Work packages for Machine technical work
- Machine engineering design work
- Civil engineering and site related work
- Timeline for preparing the physics programme
- Reference cost for the Pre-lab work

## *Pre-lab governance model*

- Pre-lab is set up as an international collaboration of national, intergovernmental and university laboratories governed through the Memorandums of Understanding (MoUs).
- Technical preparation works are defined as work packages and delivered by the participating laboratories as in-kind contributions.
- Assembly of the participating laboratories is the highest decision making body of the Pre-lab. A forum for the funding agencies and national authorities to monitor the progress.
- Directorate headed by the director is running the Pre-lab and coordinate the overall work, but the execution of the work packages are fully under the control of responsible laboratories, including the resource acquisition.
- Pre-lab facilitates the community to develop ideas, to make R&D and to form collaborations for designing and proposing the ILC experiments.

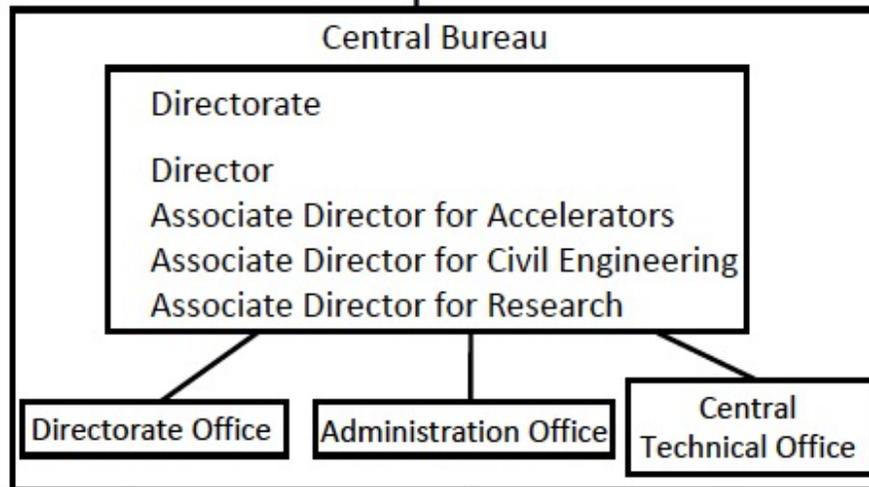
# Pre-lab organisation chart

*Decision making body by the representatives of laboratories providing In-kind contributions*

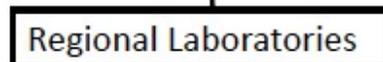
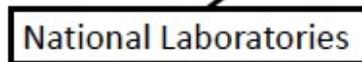


*A forum of funding agencies and national authorities the monitor the progress*

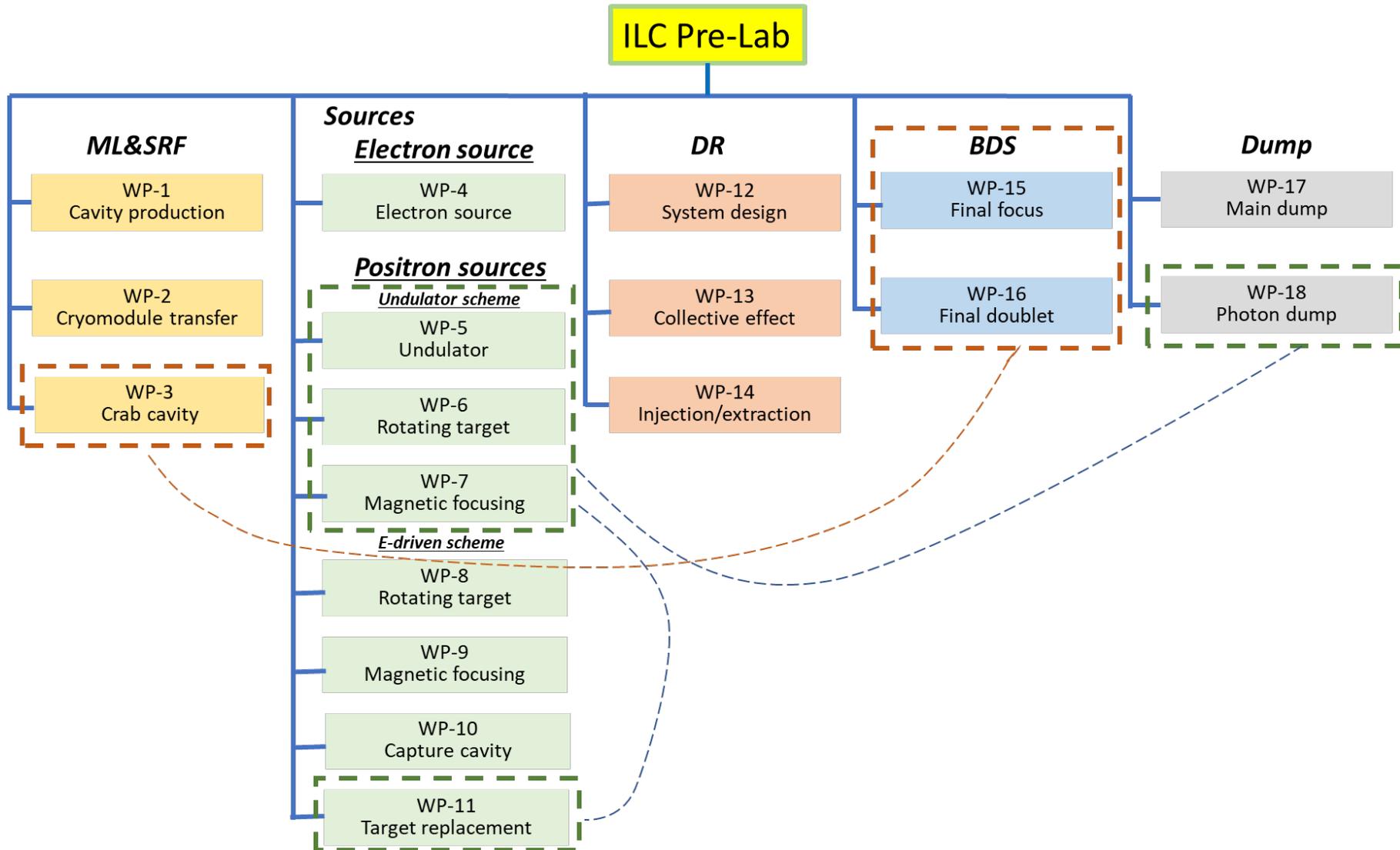
*Executive body of the Pre-lab and supporting groups located in Japan*



*Participants (stakeholder) of the Pre-lab providing work package deliverables as in-kind contributions*



# Pre-lab machine work packages



## *Pre-lab start-up process*

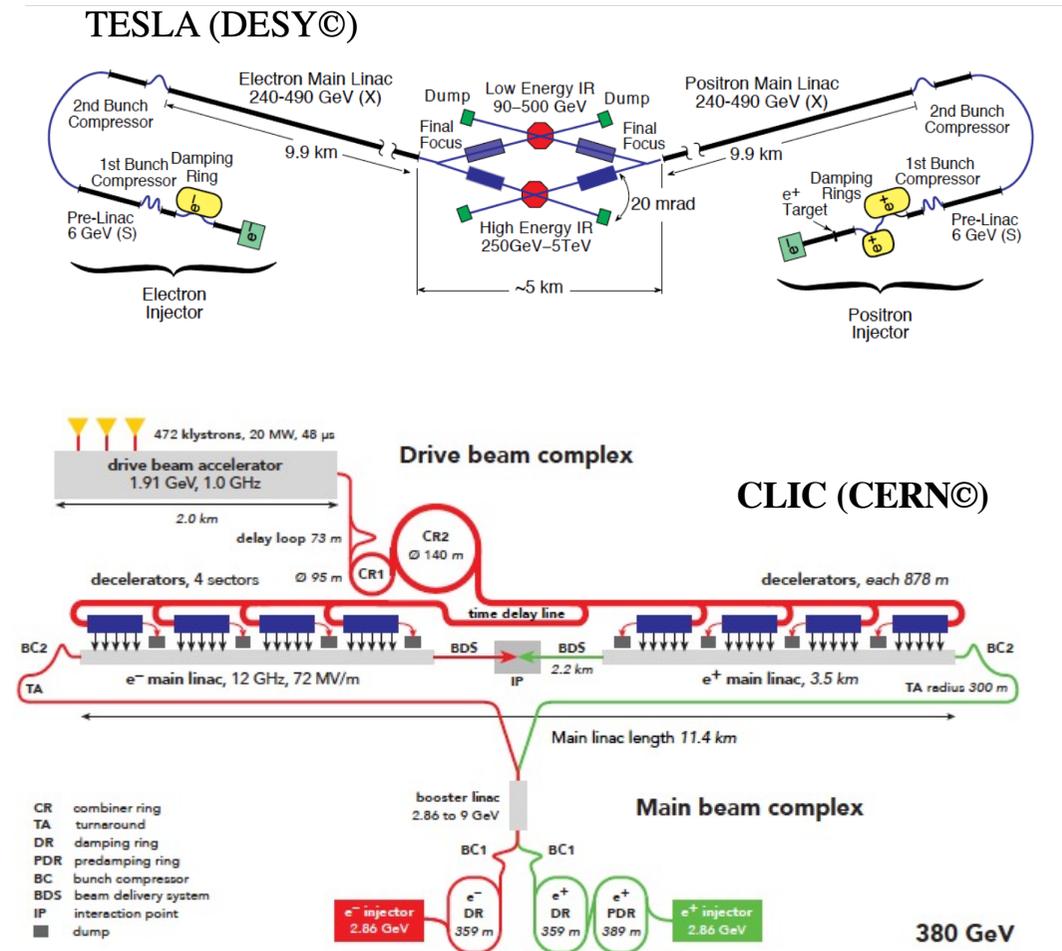
- The proposed process is in three stages primarily based on the laboratories planning to contribute to the Pre-lab:
  1. **Identifying a small number of major particle physics laboratories** worldwide who are ready to act as “**founding laboratories**” and discuss the procedure.
  2. **Common declaration of “founding laboratories”** to launch the ILC Pre-lab forming the Steering Board and appointing Director and Associate Directors, in consultation with other laboratories interested in participating in the Pre-lab.
  3. **Signing of MoUs with laboratories** defining their contribution to the Pre-lab and establishing the Central Bureau

where the IDT will facilitate this process

- The start of the process awaits **a positive indication from Japan for the interest to host the ILC and support to start the Pre-lab.**

# Europe and Linear Colliders

- Two European activities on linear colliders:
  - **TESLA** proposed by DESY, based on the **super conducting RF cavities**. Not accepted by the German government, **but taken over by the ILC effort** (together with JLC+NLC)
  - **CLIC** lead by CERN, based on the X-band frequency **normal conducting RF cavity fed by the drive-beam**. Small scale R&D work continues. If the ILC is built, it will be integrated into the ILC effort.



## *European position toward the ILC (I)*

- Many European laboratories and physicists have been the key members of the ILC, for both accelerator and physics/experiments: e.g. contribution to the ILC TDR (2013).
- European Strategy for Particle Physics:
  - First strategy in 2006  
*there should be a strong well-coordinated European activity, including CERN, through the Global Design Effort, for its design and technical preparation towards the construction decision, to be ready for a new assessment by Council around 2010.*
  - First update in 2013  
*The initiative from the Japanese particle physics community to host the ILC in Japan is most welcome, and European groups are eager to participate. Europe looks forward to a proposal from Japan to discuss a possible participation.*
  - Second update in 2020  
*The timely realisation of the electron-positron International Linear Collider (ILC) in Japan would be compatible with this strategy and, in that case, the European particle physics community would wish to collaborate.*

## *European position toward the ILC (II)*

- European community is still interested in the ILC continues to work on the ILC: see for example,
  - **2018 document: ILC European Action Plan**  
Towards a European Contribution to the International Linear Collider
  - Number of people participated in Pre-lab Proposal work
    - ▶ governance, organisation, start-up scenario  
**5 from EU**, 4 from US+CA, 1 from JP (WG 1)
    - ▶ accelerator work packages, site related issues, cost, work plan (WG2)  
**42 from EU**, 18 from US+CA, 16 from JP (mainly Working Group 2)
    - ▶ IDT WG 3 (56 + many more)  
Steering body with **24 from EU**, 17 from US+CA, 15 from CN+IN+JP  
and four sub-groups plus Speaker's Bureau

Important to note:

The ILC hosted in Japan is **an international project with Japanese initiative**, i.e. an indication of **interest to host by Japanese government is essential to start**

*Lastly*

We are all looking forward to the start of the ILC Pre-lab soon.