

19 October 2020

ILC International Development Team: Plans and perspectives

Presentation at
American Workhsop on Linear Collider 2020
Remote meeting hosted by SLAC
19-23 October 2020

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

Development in 2020

- In February 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, LCB/LCC ended their terms defined by the ICFA.
- In August 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.

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.

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: Tomohiko Tanabe (KEK)

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.

Pre-lab accelerator activities

- **Technical preparations & SRF R&D for cost reduction** [shared across regions]
 - SRF performance R&D
 - Positron source final design and verification
 - Nanobeams (ATF3 and related): Interaction region: beam focus, control and Damping ring: fast kicker, feedback
 - Beam dump: system design, beam window, cooling water circulation
 - Other technical developments considered performance critical
- **Final technical design and documentation** [central office in Japan with a support from other labs]
 - Engineering design and documentation, WBS
 - Cost confirmation/estimates, tender and purchase preparation, transport planning, mass-production planning and QA plans, schedule follow up and construction schedule preparation
 - Site planning including environmental studies, civil engineering, safety and infrastructure (see below for details)
 - Review office
 - Resource follow up and planning (including human resources)
- **Preparation and planning of deliverables** [distributed across regions coordinated by the central office]
 - Prototyping and qualification in local industries and laboratories, from SRF production lines to individual WBS items
 - Local infrastructure development including preparation for the construction phase
 - Financial follow up, planning and strategies for these activities
- **Civil engineering, local infrastructure and site** [mainly by the Japanese institutions]
 - Engineering design including cost confirmation/estimate
 - Environmental impact assessment and land access
 - Specification update of the underground areas including the experimental hall
 - Specification update for the surface building for technical scientific and administrative needs

(detailed discussion in S. Michizono's talk)

Pre-lab physics and detector activities

- **Preparing the ILC physics programme** by
 - setting up the ILC Committee (ILCC) as a programme committee for the ILC at the start of the Pre-lab.
 - Call for Expressions of Interest (EoIs) after ~0.5 year for experiments covering a broad physics spectra which can be done at the ILC.
 - Call for Letters of Intent (LoIs) about one year after the EoIs. The ILCC will select a subset of LoIs to proceed for the next step.
 - Call for a Technical Proposal/Technical Design Report shortly before the transition to the ILC Laboratory, where the final approval of the experiments will be made by the ILC Laboratory.
- **Approving and monitoring of the progress for the detector R&D programme** by the ILCC.
- **Organising occasional physics workshops** to reflect on the on-going progress relevant for the ILC physics.

This timeline is the current IDT thoughts and the actual implementation will be led by the Pre-lab directorate

(See the afternoon plenary session on Thursday 22nd with Google Doc question possibility)

Rough timeline of the ILC under discussion

ILC IDT (~1.5 years)

- Prepare the work and deliverables of the ILC Pre-laboratory and workout with national and regional laboratories a scenario for their contributions
- Prepare a proposal for the organisation and governance of the ILC Pre-laboratory

In parallel:

Positive “signs” from the host country (Japan) government and agreements by the national/regional laboratories for providing their contributions.



ILC Pre-laboratory (~4 years)

- Complete all the technical preparation necessary to start the ILC project (infrastructure, environmental impact and accelerator facility)
- Prepare scenarios for the regional contributions to and organisation for the ILC.

In parallel:

Positive outcomes of the inter-governmental negotiation for the responsibility and cost sharing among the host (Japan) and partner countries



ILC laboratory

- Construction and commissioning of the ILC (~10 years)
- Followed by the operation of the ILC
- Managing the scientific programme of the ILC

Intended IDT goals for this year

- Try to establish
 - a preliminary list of **Pre-lab tasks and deliverables** and **national/regional laboratories which might be interested** in contributing to those
 - **Pre-lab resource needs** for the regional activities and central office (a few % of the ILC cost)
 - a preliminary **proposal for the Pre-lab organisation and governance** by the end of this year.
 - ⇒ **Needed for the Pre-lab Japanese funding request** preparation by KEK in 2021 to obtain funding in 2022: a similar requirement for the other countries expected.

(for details, see S. Stapnes and A. Lankford's talk)

IDT activities for the next year include

- Finalise all the inputs needed to set-up the Pre-lab
- Try to attract more (new) people for the physics and detector activities by
 - Encouraging the next Linear Collider workshop (LCWS series) in spring 2021 in Europe where the programme could include a broad discussion on the ILC physics opportunities. (see talk by S. Stapnes)
 - Organising a dedicated workshop in autumn 2021 to discuss ideas for experiments at the ILC, at the collision point and beyond covering broad physics spectra, and associated R&D activities.

Final remarks

The ILC International Team has just started to work in August:

setting up the working groups

establishing a firm understanding for the Pre-lab work, function and organisation

establishing a common understanding for the Pre-lab startup conditions

estimating the required resources by the Pre-lab

etc., etc.

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**A lot of work ahead and not much time available,
but an exciting moment and a worldwide support is needed
from the community, e.g. through the Snowmass process!**