

# IDT-WG2 report

## *Shin MICHIZONO (KEK/IDT-WG2)*

### *(July 26, 2022)*

July 17-26: Snowmass Community Summer Study Workshop

<http://seattlesnowmass2021.net/>

NOTE: This schedule is not yet final	Saturday, July 16	Sunday, July 17	Monday, July 18	Tuesday, July 19	Wednesday, July 20	Thursday, July 21	Friday, July 22	Saturday, July 23	Sunday, July 24	Monday, July 25	Tuesday, July 26	Wednesday, July 27
		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	
7:30 AM												
8:00 AM		Registration								National Study NAS EPP Decadal study		
8:30 AM												
9:00 AM												
9:30 AM												
10:00 AM		Introductory Plenary	Parallel	Parallel	Parallel	Parallel	Parallel	Parallel	Parallel	Snowmass Summary (Program under development)	Snowmass Summary (Program under development)	
11:00 AM												
12:00 PM												
1:00 PM		Lunch	Lunch, Poster & Exhibit	Lunch, Poster & Exhibit	Lunch, Poster & Exhibit	Lunch	Lunch	Lunch & Communicating HEP to the public and the govt.	Lunch	Lunch	Closing Remarks	
2:00 PM												
3:00 PM		Introductory Plenary	Parallel 1: AI/ML Parallel 2: Underground	Panel: Careers and Training the Next Generations	Parallel 1: Neutrino Parallel 2: Rare processes	Colloquium on Rare Processes and Precision Measurements	Colloquium on Underground Physics	Colloquium on Energy Frontier Physics	Presentation: Snowmass Early Career	Panel: Interconnections with other fields		
3:30 PM												
4:00 PM		Coffee	Parallel 1: The next accelerators Parallel 2: LQCD	Parallel 1: Lepton Colliders Parallel 2: Cosmic	Colloquium on Instrumentation	Colloquium on new Accelerators and R&D	Colloquium on Theory	Colloquium on Computing	Parallel 1: Underrepresented Minorities Parallel 2: Instrumentation projects	Talks: National, International Leaders		
5:00 PM	Pre-Registration	Planning US HEP: past, present, future	Coffee	Coffee		Coffee	Coffee	Coffee	Coffee			
6:00 PM			DEI: Talks and Panel	Colloquium on Community Engagement		Colloquium on Cosmic Frontier Probes of Fundamental Physics	Colloquium on Neutrino Physics	Quantum Information Science in HEP	talks DOE, NSF, FNAL Director, other US labs	Panel International Status and Plans		
7:00 PM												
8:00 PM			Reception & Poster & Industry Partners		Adam Riess Public Lecture	Physics Slam		Colliderscope				
9:00 PM				stry Networking			Conference Dinner					
10:00 PM												

Next IDT-WG2 meeting : **Aug. 23 (Tue.)**  
(No meeting on Aug.9)

IDT-WG2 meeting on July 26, 2022

Monday, July 25

**4:00 PM → 5:30 PM Physics Highlights from the Frontiers: National & International Laboratory Plans**

description here

[7-25 Interconnectio...](#) [July 25 Plenary Mor...](#) [National and Intern...](#) [Snowmass Questio...](#)

**4:00 PM**

**Introduction**

**Speaker:** Jonathan Bagger (Johns Hopkins University)

[Bagger-Snowmass....](#) [Bagger-Snowmass....](#)

**4:10 PM**

**CERN Perspective**

**Speakers:** Fabiola Gianotti (CERN), Fabiola Gianotti (CERN)

[Snowmass-CERN-p...](#) [Snowmass-CERN-p...](#)

**4:25 PM**

**Fermilab Perspective**

**Speakers:** Lia Merminga (TRIUMF), Lia Merminga (FNAL)

[Merminga - Snowm...](#) [Merminga - Snowm...](#)

**4:40 PM**

**IHEP Perspective**

**Speaker:** Yifang Wang (IHEP)

[IHEP-roadmap.pdf](#) [IHEP-roadmap.pptx](#)

**4:55 PM**

**KEK Perspective**

**Speakers:** Masa Yamauchi (KEK), Masanori Yamauchi (KEK), Masanori Yamauchi (KEK)

[Snowmass July 202...](#) [Snowmass July 202...](#)

**5:10 PM**

**Questions and discussion**

**5:30 PM → 7:10 PM Physics Highlights from the Frontiers: Examples of International and National Status and Plans**

description here

[7-25 Interconnectio...](#) [July 25 Plenary Mor...](#) [National and Intern...](#) [Snowmass Questio...](#)

**5:30 PM**

**View from the CERN Council**

**Speaker:** Eliezer Rabinovici (Hebrew University)

[250722 Eliezer SNO...](#)

**5:45 PM**

**Particle Physics in Latin America**

**Speaker:** Fernando Quevedo

**5:55 PM**

**View from Canada**

**Speaker:** Nigel Smith (TRIUMF)

[2022-07-24 Snowm...](#)

**6:10 PM**

**View from ICFA**

**Speaker:** Stuart Henderson (Thomas Jefferson National Accelerator Facility)

[ICFA Snowmass v2....](#) [ICFA Snowmass v2....](#)

**6:25 PM**

**HEP in Africa**

**Speaker:** Ketevi Adikle Assamagan (Brookhaven National Laboratory)

[CSS-HEP-in-Africa-J...](#)

**6:35 PM**

**Report from ILC International Development Team**

**Speaker:** Tatsuya Nakada (EPFL)

[IDT-report.pdf](#)

**6:45 PM**

**Questions and discussion**



# **Particle Physics Program in Japan**

**July 25, 2022  
Snowmass Meeting in Seattle**

**M.Yamauchi  
KEK**

## Five-party meeting (Mar. 2021 - )

- ILC Federation of Diet Members
- MEXT
- Physicists
- Industrial sector
- Candidate site

Productive discussions of possible solutions to the problems to realize ILC by all the stakeholders

## ■ Outcome of the meeting so far

- It was agreed that the physics community will report on the progress made over the past three years.
- It was recommended to MEXT to hold a meeting of experts to evaluate this report and the Pre-lab proposal by the IDT.
- It was also at this meeting that MEXT was recommended to exchange views with the governments of US and European countries.

## ILC-Japan (May 2021 - )

- Spokesperson: Shoji Asai (U. Tokyo)
- Executive board
- Taskforces
- Working groups

Organize activities of the Japanese physics community to realize the ILC.

## ■ Activities of ILC-Japan

- We focused on providing good input to the ILC Advisory Panel at MEXT.
- ILC communications
- Activities to deepen the understanding of ILC by scientists in other fields

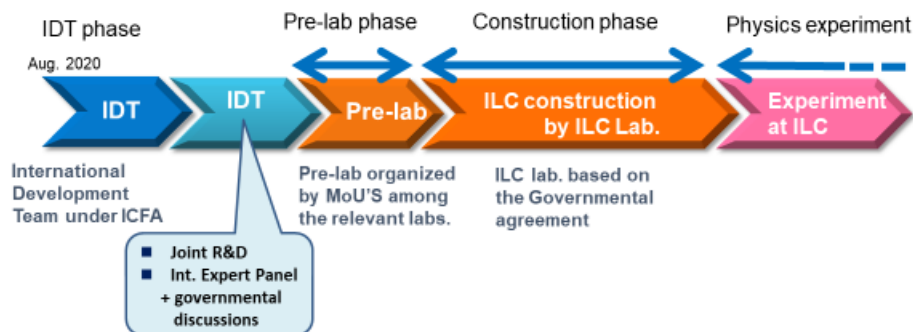
KEK

## ■ Create a new international collaborative framework to implement the most urgent work packages.

- We believe that it is highly likely that the budget for this will be approved in Japan in JFY2023.
- Detailed R&D plan is being elaborated in the IDT-WG2.
- We are about to start discussions with related laboratories to exchange MOU's between the laboratories.

## ■ An International Expert Panel will be set up by IDT to deepen discussions in two or three stages, and then, hold meetings to explain the progress to the representatives of the relevant governments. With this as a starting point, we will encourage intergovernmental discussions on the ILC.

- At least one meeting attended by the government representatives will be held by the end of this year.



## • Particle physics program at KEK

- Long baseline neutrino program at J-PARC/SuperKamiokande
- Flavor physics at J-PARC:  $K_L$  and  $\mu$
- High precision measurements of  $B$ ,  $D$  and  $\tau$  decays with SuperKEKB/Belle II
- >100 Japanese physicists are involved in ATLAS. KEK takes a role of supporting them.

## • KEK is also working on next step in (astro-)particle physics.

- Upgrade of J-PARC MR for HyperKamiokande
- Contribution to HL-LHC and the ATLAS upgrade
- LiteBIRD to test cosmic inflation and quantum gravity

## • We are committed to play a leading role in realizing ILC.

- Create a new international collaborative framework to implement the most urgent work packages in advance.
- An International Expert Panel will be set up by IDT to deepen discussions in two or three stages, and then, hold meetings to explain the progress to the representatives of the relevant governments.

Report from  
the ILC International Development Team  
Community Snowmass Study, Seattle, 17-26 July 2022

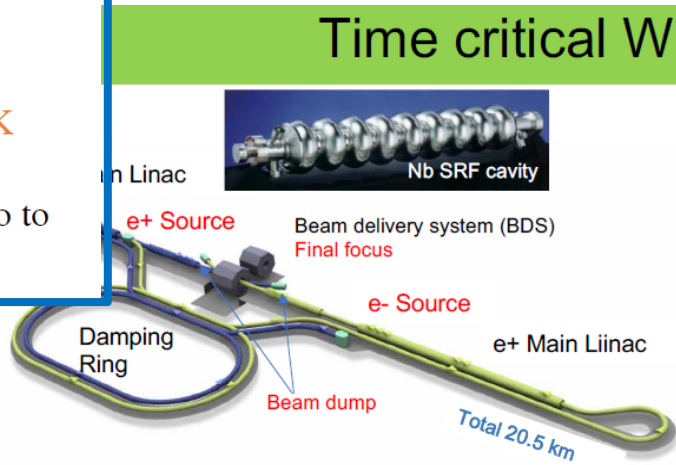
Tatsuya NAKADA (EPFL, Lausanne Switzerland)  
Chair of the IDT Executive Board

# What are the current IDT activities ? I

## International network for the ILC related technology development

- Making further advances in the development of ILC related technologies in view of providing more solid bases for the ILC engineering design and opportunities for other accelerator applications.
- The work programme derived from the work packages in the ILC Pre-lab proposal by selecting technically most critical items and those that require long time to develop.
- Based on collaboration agreements between KEK and interested laboratories worldwide.
- The execution of the work will be managed by the each collaborations. The IDT will provide the overall coordination work including
  1. Technical description of the work programme
  2. Definition of deliverables and required resources
  3. Distribution of the deliverables and defining the timeline
  4. Help drafting of MoU and research agreements
  5. Follow up and monitoring of the overall project
- Anticipated start in April 2023, the start of the Japanese Fiscal Year 2023 for a period of two to four years depending on the work.

completed  
in progress  
require substantially  
increased funding @KEK  
(See M. Yamauchi talk)



### Time critical WPs

Item	Parameters
C.M. Energy	250 GeV
Length	20km
Luminosity	$1.35 \times 10^{34} \text{ cm}^{-2}\text{s}^{-1}$
Repetition	5 Hz
Beam Pulse Period	0.73 ms
Beam Current	5.8 mA (in pulse)
Beam size (y) at FF	7.7 nm@250GeV
SRF Cavity G.	31.5 MV/m (35 MV/m)
Q <sub>0</sub>	$Q_0 = 1 \times 10^{10}$

Area	Role	Topics	WPs
Sources	Produce the required amount of e-/e+	Undulator e+ source e-Driven e+ source e- source	WP-prime 6/7/11 WP-prime 8/9/10/11 WP-prime 4
SRF	Accelerate e-/e+ to the required energy at Main Linacs	High performance cavity Cryomodule design Crab cavity	WP-prime 1 WP-prime 2 WP-prime 3
Nano-beam	Narrow the beam to obtain a required luminosity	Final focus Damping ring Beam dump	WP-prime 15/16 WP-prime 12/14 WP-prime 17



# What are the current IDT activities ? II

## Setting up the IDT International Expert Panel, for

### Step 1 **Developing a path for a global project adoptable for the ILC:**

- Establish the full lifecycle of an accelerator global project, adoptable to the ILC
- Identify decision points and decision makers in the lifecycle
- Identify associated responsibilities for the decision makers
- Identify consequence of those decisions.
- Share this idea with the government authorities (CA, CERN, DE, ES, FR, GB, IT, JP, US and possibly others)
- Produce a discussion document summarising the emerging consensus

### Step 2 **Developing the ILC decision roadmap by adopting this path**

- Adapting the ILC realisation to the process described in the discussion document
- Achieving the consensus among the government authorities for the adaptation.
- Producing a second discussion document

After this exercise, the governments might be in a better position to discuss the ILC, which could lead us to the Pre-lab and beyond.

#### IDT International Expert Panel members

Panel members		Core Group
Ursula Basser	(FR)	Andrew Lankford
Philip Burrows	(GB)	Steinar Stapnes
Beate Heinemann	(DE)	Geoffrey Taylor
Stuart Henderson	(US, ICFA Chair)	
Karl Jacobs	(DE, EFCA Chair)	
Andrew Lankford	(US, IDT-EB Americas)	
Nadia Pastrone	(IT)	
Antonio Pich	(ES)	
Steinar Stapnes	(CERN, IDT-EB Europe)	
Nigel Smith	(CA)	Chair
Geoffrey Taylor	(AU, IDT-EB Asia-Pacific)	Tatsuya Nakada (IDT-EB Chair)
Katsuo Tokushuku	(JP)	Scientific Secretary
		Wataru Ootani (IDT EB Scientific Secretary)

What is the goal in spring 2023?

- The International Network for the ILC related technology development is ready to start or even has started.
- The International Expert Panel makes a significant advancement in the discussion for Step 1

Your support would be needed!