



IUPAP Working Group 1: International Committee for Future Accelerators (ICFA) Report to the 30th IUPAP General Assembly

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Stuart Henderson (ICFA chair, JLAB)

Thomas Schörner-Sadenius (ICFA secretary, DESY)

New ICFA leadership; ICFA membership

At the beginning of the year 2021, ICFA leadership changed. After Joachim Mnich (DESY, Germany, 2015-17) and Geoffrey Taylor (U Melbourne, Australia, 2018-20), Stuart Henderson (JLAB, USA) took over the office of ICFA chair for a three-year term. Similarly, long-time ICFA secretary Pushpalatha Bhat (FNAL, USA) passed the office on to Thomas Schörner (DESY, Germany).

The years since the last ICFA report to the IUPAP General Assembly also saw several changes in ICFA membership. The current composition of the working group can be found on the corresponding web page, <https://icfa.hep.net>.

Working Group Chair's Perspective

ICFA is a very active organization that plays a central role in fostering communication and collaboration, and coordinating activities across the globe in the field of particle physics. ICFA has served this essential role for nearly 50 years, and should certainly continue.

Global planning for HEP

The past four years since saw, among other things, the publication of a new European strategy for particle physics in August 2020 and the initiation of the new round of strategy updates in the USA via the so-called Snowmass process.

ICFA applauded the former in a statement in 2020¹, in which it congratulated the European particle physics community and CERN on the bold vision for particle physics articulated in the Strategy Update, and supported its call for strong international collaboration that continues to be a unique strength in the field.

As ICFA provides a framework for discussion amongst the world's particle physics laboratory directors, regular updates on regional progress are included in each ICFA meeting to foster information transfer and coordination.

¹ https://icfa.hep.net/wp-content/uploads/ICFA_Statement_2020ESPPUpdate.pdf

ILC International Development Team IDT

The past three years have seen substantial activity in the field of linear colliders and in particular for the International Linear Collider (ILC) and for linear colliders in general. Prior to summer 2020, the work in this field was organized by the Linear Collider Collaboration (LCC), led by the Linear Collider Collaboration Board (LCB), an international panel under ICFA. Since then, the International Development Team IDT has been installed and now coordinates the efforts towards the ILC, as described below.

In July 2018, the MEXT ILC Advisory Panel published its report² on the maturity of the ILC project, taking close looks at the scientific merit and validating the cost estimates, the human resources planning, the organization of the project and the international cooperation aspects.

ICFA and LCB reacted to this report and to MEXT's conclusions on it with a letter³ and a statement⁴ in March 2019 that acknowledged MEXT's continued interest in the ILC, while emphasizing that the lack of a clear statement of Japan's position regarding hosting the ILC will be a consideration in global planning for HEP.

Upon completion of the LCC mandate in June 2020, ICFA approved the formation of the ILC International Development Team⁵ (IDT) in August 2020 as the first step towards the preparatory phase of the ILC project, with a mandate to make preparations for the ILC Pre-Laboratory (Pre-Lab) in Japan.

The ILC International Development team will work towards making a timely realisation of the ILC possible. The team consists of the Executive Board and three working groups (see figure 1). The team is hosted by the High Energy Accelerator Research Organization (KEK) in Japan. In detail, the tasks of the IDT are the following:

- Clarify the function and organization of the ILC pre-laboratory.
- Develop a common understanding for the condition to start the ILC pre-laboratory.
- Provide an international framework for the ILC accelerator effort.
- Coordinate further R&D and engineering design work for a smooth transition to the ILC pre-laboratory phase.
- Provide an international framework for the ILC physics and detector activities.

² https://icfa.hep.net/wp-content/uploads/MEXT_AdvPanel_Report_July2018.pdf

³ https://icfa.hep.net/wp-content/uploads/LCB_letter_to_MEXT-signed.pdf

⁴ https://icfa.hep.net/wp-content/uploads/ICFA_Tokyo_Statement_March2019.pdf

⁵ https://icfa.hep.net/wp-content/uploads/ILC_Pre_lab_Proposal.pdf

- Coordinate physics and detector R&D effort for a smooth transition to the ILC pre-laboratory phase.
- Negotiate with international partners for resources needed for the ILC pre-laboratory.
- Work with national authorities to help in establishing the ILC pre-laboratory.



Figure 1: IDT organisational structure.

In June 2021, the IDT submitted a proposal for the ILC pre-laboratory to MEXT, detailing answers to the above questions and specifying a clear work package structure (see figure 2).

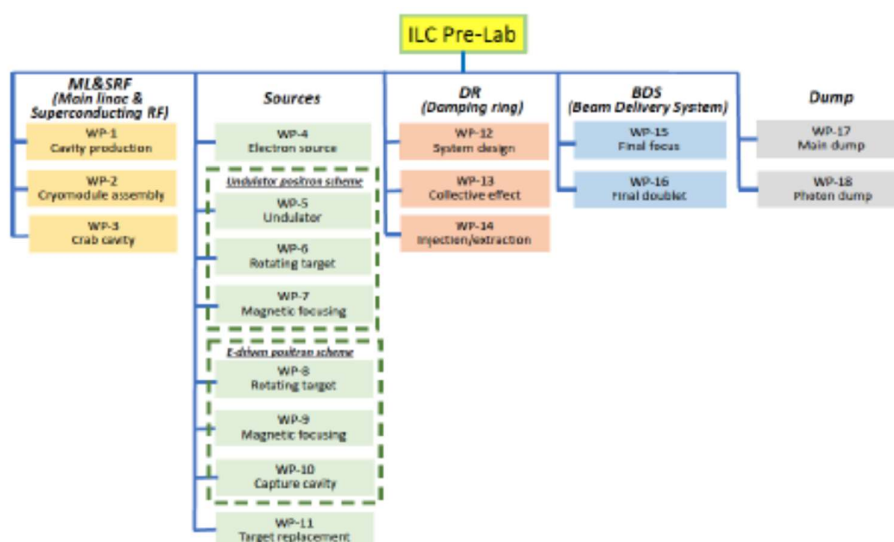


Figure 2: Work packages of the IDT pre-laboratory proposal.

There have also been recent political developments, not least a letter from ICFA to MEXT Minister Hagiuda in April 2021⁶. In May, ICFA received a reply from the minister, stating that

- ... under *“the current situation that the perspective of broad internal and external cooperation for the ILC project itself as well as its pre-laboratory is not promised, it is difficult to obtain the Japanese citizens’ understanding for investing in the pre-laboratory.”*
- It is also *“necessary to obtain the clear perspectives on financial contributions to the ILC project itself by the United States and European countries prior to considering the pre-laboratory budget.”*

As a consequence of these developments, MEXT did not request a pre-lab budget for fiscal year 2022, and has re-engaged the MEXT ILC Advisory Panel to assess progress, prospects for international cooperation and cost sharing, academic significance, technical feasibility, cost estimate, etc. Similarly, MEXT will – on a short timescale – again contact US and European counterparts in order to discuss potential collaboration and probably cost sharing. As MEXT stated: *“With regard to the above-mentioned discussion, considering the comments from the US and European counterparts, it would be important that the progress of communications between particle physics researchers in the US and European countries and their government authorities is made.”*

Consequently, the current focus of the IDT is on addressing the questions on the ILC progress during the past three years that are currently again being considered by MEXT’s ILC Advisory Panel. IDT is also preparing a virtual workshop in October 2021 on potential experiments (ILCX2021, 26-29 October) that aims at broadening the scientific basis of research at the ILC.

ICFA seminar

The last ICFA Seminar – a triennial event for about 250 leaders of the field surveying the status of particle physics – took place in November 2017 in Ottawa, Canada. Another ICFA seminar was planned for October 2020 in Berlin, Germany, but – due to the Covid-19 pandemic – had to be shifted twice, first to October 2021 and then to March 2022.

Given the lingering global pandemic situation and the persisting travel restrictions in many parts of the world, ICFA recently decided to cancel the ICFA seminar, postponing it indefinitely until safe travel and the organization of an in-person meeting for several hundred people is practical.

⁶ <https://icfa.hep.net/wp-content/uploads/ICFA-Letter-to-Minister-Hagiuda-March-17-2021.pdf>

ICFA panels

There are currently seven ICFA panels in existence as listed below (panel chair in brackets):

- ILC International Development Team (Tatsuya Nakada, EPFL, Lausanne)
- [ICFA Instrumentation Innovation and Development Panel](#) (Ian Shipsey, Oxford)
- [ICFA Beam Dynamics Panel](#) (Ingo Hofmann, GSI/TUD)
- [ICFA Panel on Advanced and Novel Accelerators](#) (Philippe Piot, Argonne/NIU)
- [ICFA Standing Committee on Interregional Connectivity](#) (Harvey Newman, Caltech)
- [ICFA Study Group on Data Preservation in High Energy Physics](#) (Cristinel Diaconu, CPPM, Marseille)
- [ICFA Panel on Sustainable Accelerators and Colliders](#) (Thomas Roser, BNL)

All panels are actively working; an assessment of the validity of their mandates (leading to small modifications of the latter) has taken place in summer 2021. Also in summer 2021 the chair of the panel for sustainable accelerators changed to Thomas Roser; and the chair of the beam dynamics panel is in transition from Ingo Hofmann to Yunhai Cai (SLAC). Most of the panels regularly organize workshops, and one (beam dynamics) regularly publishes reports in the literature.

A next step for ICFA is to have a closer look at panel membership and to ensure that panel members are regularly exchanged, that they reflect the proper diversity of the fields, and that they always represent the state of the art in the respective fields.

ICFA is starting to discuss the idea for a panel on HEP software.

A set of rules for the endorsement of conferences and workshops by ICFA has been worked out recently.

A new development in the field of the “Instrumentation Innovation and Development” panel is the introduction of “instrumentation awards” and “instrumentation studentships”. The former will come in the shape of one senior and one junior award for particular achievements in the field of instrumentation; they will first be awarded in 2022.

On the question of instrumentation studentships, a survey of best practices was conducted by the panel that is now developing a proposal to seek funding (UNESCO & EU) to create a pilot program of studentships partnering national labs and universities modelled on the CERN Technical and Doctoral Student and on the U.S. DOE HEP GIRA programs.

Past and future ICFA meetings

Since 2017, ICFA meetings have taken place on a regular basis, typically two or three times a year. Since the beginning of the Covid-19 pandemic, meetings have mostly been virtual, though.

- November 2017: 80th ICFA meeting and 12th ICFA seminar, Ottawa, Canada
- 2018: ICFA meetings in Cambridge (UK) and Seoul (South Korea)
- 2019: ICFA meetings in Tokyo (Japan) and Toronto (Canada)
- 2020: ICFA in -person meeting at SLAC (USA); two virtual meetings
- 2021: virtual ICFA meetings in March and June.

The next ICFA meeting is about to be scheduled either for late autumn 2021 or for early 2022 (possibly in the framework of the Lepton-Photon conference in Manchester, UK).