



DIRECTOR'S CORNER

This technology network has acceleration potential

by Shinichiro Michizono



During the recent kick-off meeting of the ILC Technology Network ITN at CERN, some 20 research and R&D labs from around the world came together to see whether they would like to contribute to the network, and if so, what. Shin Michizono, head of all things acceleration in the International Development Team, sees great potential in the ITN, not only for progress on the ILC accelerator itself, but also for the participating labs and many varied fields of potential application.

ANNOUNCEMENTS

Save the date! LCWS2024 to be held in Tokyo



The next International Workshop on Future Linear Colliders (LCWS2024) will take place in Tokyo, Japan on July 8-11. It continues the workshop series devoted to the study of the physics, detectors, and accelerators related to high-energy linear electron-positron colliders.

Significant progress during this year includes the conclusion of the Snowmass/P5 process, the ongoing ECFA Higgs/EW/top factory study, the ILC Technology Network kick-off, and the setting up of Detector R&D collaborations (to pick just a few). We look forward to how these activities will shape the field, for example the upcoming update of the European Strategy for Particle Physics.

Join us in Tokyo to discuss these developments and work towards our future, in a wide ranging program of plenary, parallel, and poster sessions.

AROUND THE WORLD

From KEK: Promoting the technological development of the International Linear Collider

ILC Technology Network kicks off with well attended information meeting



The ILC Technology Network Information Meeting was held at CERN on October 16 and 17. The event was jointly hosted by KEK and the IDT, and 21 research institutes from the Americas, Europe, and the Asia-Oceanian region presented their progress in ITN activities, or their areas of expertise and technical interests.

AROUND THE WORLD

American Physical Society awards 2024 Robert R. Wilson Prize to Kaoru Yokoya, Diamond Fellow of KEK



The American Physical Society (APS) has announced that the 2024 Robert R. Wilson Prize for achievement in the physics of Particle Accelerators will be awarded to Kaoru Yokoya, a Diamond Fellow and Professor Emeritus of KEK Accelerator Laboratory, and former ILC Global Design Effort Asian Regional Director. He receives the prize for his outstanding contributions in the areas of the theory and control of beam polarization in electron storage rings, beam-beam interactions in linear colliders, crab-crossing and coherent beam-beam interactions in circular colliders, and bunched beam instabilities. Congratulations to Kaoru!

VIDEO OF THE WEEK



Shoji Asai goes science festival: ILC lecture and workshop with young science fans at Science Agora 2023

by Rika Takahashi

On 19 November, Shoji Asai, Spokesperson for ILC-Japan, together with Shunki Sugai, a popular Japanese science communicator on YouTube, presented a lecture and workshop for young science enthusiasts at "the Science Agora," Japan's one of the biggest science festival held in Tokyo.

A group of 24 participants, ranging in age from 10 to college seniors, attended the workshop with an audience of about 150 people. The archived footage of the event has already been viewed over 13,000 times in one day.

IN THE NEWS

from *Nikkan Sports*

20 November 2023

大谷翔平と小中高ともにプレーの幼なじみの父「まさかこんなにビッグに」故郷の人々は応援続ける

故郷の人々は、世界レベルで戦う大谷の応援を続ける。その一方で、奥州市も世界と戦っている。「国際リニアコライダー (ILC)」と呼ばれる、ビッグバンを再現できるという直線加速器の研究施設を東北に誘致するため、政府や国際機関と話し合いを継続中。—野球と直接的な関連はないが、世界を舞台に羽ばたく意味では、その姿が重なる。(People in his hometown continue to support Shohei Otani as he competes at the world level. Meanwhile, Oshu City is also competing with the world. It is in ongoing discussions with the government and international organizations to bring the International Linear Collider (ILC), a linear accelerator research facility that is said to be able to recreate the Big Bang, to Tohoku. —Although not directly related to baseball, the two cities overlap in the sense that they are competing on the world stage)

from *CERN Courier*

09 November 2023

The future is international

The successful accomplishment of ongoing programmes (SuperKEKB, J-PARC upgrade and Hyper-Kamiokande) is the top priority in the coming years. KEK also has photon factories, and upgrades to these are urgent. The International Linear Collider (ILC) is the top priority after SuperKEKB and the construction of Hyper-Kamiokande (Hyper-K).

from *Tokyo Web*

08 November 2023

中国の加速器、27年着工も 全周100キロ、日欧に対抗

宇宙誕生の謎を探る次世代加速器について、中国が2027年にも全周約100キロの巨大円形加速器 (CEPC) の建設開始を目指していることが8日分かった。欧州の新型円形加速器 (FCC) や、岩手・宮城両県の北上山地が候補地に挙がる国際リニアコライダー (ILC) の両計画に対抗、素粒子物理学で主導権を握る狙いとみられる。(On August 8, it was learned that China is aiming to start construction of a giant circular accelerator with a circumference of 100 km (CEPC) in 2027 to explore the mysteries of the birth of the universe. It is believed that China aims to take the lead in particle physics, competing with Europe's new FCC and the International Linear Collider (ILC) project, which has the Kitakami Mountains in Iwate and Miyagi prefectures as a candidate site.)

from *Swissinfo*

06 October 2023

CERNの次世代加速器に吹く追い風 日本のILCも再加速

FCCはLHCの「後継」的存在だが、ILCは「補完」的役割を担う。日本とCERNはライバルではなく協力関係というわけだ。CERNは今年7月、ILCの加速器技術開発の重点事項を国際共同で進める枠組み「ILCテクノロジーネットワーク」の第1号参画機関として、日本の高エネルギー加速器研究機構 (KEK) と協定を結んだ他のサイトへ。(The FCC is the “successor” to the LHC, but the ILC plays a “complementary” role. In July of this year, CERN signed an agreement with Japan's High Energy Accelerator Research Organization (KEK) as the first participant in the ILC Technology Network, a framework for international collaboration on priority issues in accelerator technology development at the ILC.)

from *Physics.org*

03 November 2023

Physicists ask: Can we make a particle collider more energy efficient?

C3 is one of a number of different proposals for a next-generation accelerator capable of probing the Higgs and beyond, although they all follow one of two basic designs: linear accelerators, such as C3 and the proposed International Linear Collider, and synchrotrons, or future circular accelerators, such as the Future Circular Collider or the Circular Electron Positron Collider.

from *TBS News*

01 November 2023

ILC国際リニアコライダーの誘致実現を支援 推進協議会へ寄付金

ILC=国際リニアコライダーの東北誘致を支援しようと先月31日、飲料メーカーの取引会社で構成する団体が講演会を開き、県ILC推進協議会へ寄付金を贈りました。—共生会は2013年から寄付を続けていて、これまでの総額は202万円あまりにのぼります。協議会は寄付金を講演会の実施など様々な活動に充てる予定です。(In an effort to support the ILC (International Linear Collider) project in Tohoku, a group of companies that do business with beverage manufacturers held a lecture last month and presented a donation to the Prefectural ILC Promotion Council on March 31. —The group has been making donations since 2013, totaling more than 2.02 million yen to date. The council plans to use the donation for various activities, such as holding lectures.)

from

PREPRINTS

ARXIV PREPRINTS

[2311.06452](#)

Two Higgs doublet model fitting and $t\bar{t}b\bar{b}$ signal at the ILC

[2311.00525](#)

Search for new particles at the ILC

[2310.20534](#)

Reconstructing long-lived particles with the ILD detector

[2310.17617](#)

Experimental prospects for indirect BSM searches in $e^+e^- \rightarrow q\bar{q}$ ($q=c,b$) processes at Higgs Factories

[2310.17406](#)

Long-lived HNLs at lepton colliders as a probe of left-right symmetric models

[2310.17270](#)

Searches for axion-like particles via $\gamma\gamma$ fusion at future e^+e^- colliders

[2309.16233](#)

Hunting for sterile neutrino with collider signatures

This technology network has acceleration potential

Shinichiro Michizono | [27 November 2023](#)



In the International Development Team's (IDT) Working Group 2 about ILC accelerators there are about 50 accelerator researchers. A total of 18 work packages have been proposed in five accelerator fields for R&D items and are summarised in [the technical proposal document](#). There are three work packages on the main linac and superconducting radio frequency fields, eight work packages in the area of the electron-positron source, three work packages for the damping rings, two in the beam delivery system and two on the beam dump. The technical proposal document was discussed by a review committee chaired by Tor Raubenheimer from SLAC National Accelerator Laboratory. These WPs will be shared internationally as an in-kind contribution.

In 2022, we compiled these items into 15 work packages (WP), especially the most time-critical and important items from this list. These are called Time-critical WPs and are extracted from the Pre-lab WPs as WP-prime. The entire cost is expected to be \$14M, and 120 FTEs. The framework for implementing the WPP is called the ILC Technology Network (ITN), a new framework aimed at promoting research and development for the ILC, and the Information Meeting held at CERN in October was the first opportunity to hear what the participating accelerator institutes in the WPP are interested in doing. The broad framework is divided into superconducting radiofrequency (SRF), the particle source, and the nanometer-level beam, each of which includes important technology development items not only for the ILC but also for advanced accelerators. For example, SRF is an essential technology for high-energy and high-current beam acceleration due to its excellent power efficiency, and in the coming years, it is expected to be applied to industrial and medical applications. Also, particle sources, such as polarized electrons and positrons, are used to search for physical properties, and targets that produce positrons share the same technology for producing high-power secondary particles (including neutrons). Nanobeam technology to obtain a high beam quality is also expected to have broad applications, including synchrotron radiation technology, microbeam development for use in industrial medical applications, and beam tuning technology including machine learning

I believe that the framework of the ITN for international collaboration is attractive not only for laboratories interested in the ILC, but also for laboratories around the world that are developing advanced accelerators. We were pleased to see the participation of many

laboratories and their interest in the various work packages. We will now begin the process of matching the interests of each institute with the work packages to be implemented by the ITN.

The ILC is a global project to be implemented through global collaboration, and the ITN, although smaller in scale, is also seeking results through global collaboration. In the ITN, there is great value not only in the technical results, but also in the fact that the project will be implemented through collaboration among research institutes around the world.

Approximately 28 research institutes participated in this ITN meeting, which I felt was a very effective opportunity to kick off the network. We made a list of WPPs that each laboratory has expressed interest in, and each laboratory will be asked to confirm this list and send a name of the contact person from their lab for each WPP. If necessary, members of IDT-WG2 will explain the details of the WPP and move on to a discussion of which parts of the WPP they might be willing to take on. Coordination will be necessary to avoid overlap in the WPP and still be able to meet the interests of each lab. Besides the technical aspects, it would also be essential for the IDT's executive board to coordinate the whole process. We would then proceed with the necessary procedures for MoU with KEK and labs around the world (if necessary). It was a very good meeting that gives us hope for the global expansion of the ITN.

Copyright © 2024 ILC International Development Team
Printed from <http://newslines.linearcollider.org>

ANNOUNCEMENTS

Save the date! LCWS2024 to be held in Tokyo

27 November 2023

The next International Workshop on Future Linear Colliders (LCWS2024) will take place in Tokyo, Japan from 8 to 11 July. It continues the workshop series devoted to the study of the physics, detectors, and accelerators related to high-energy linear electron-positron colliders.

Significant progress during this year includes the conclusion of the Snowmass/P5 process, the ongoing ECFA Higgs/EW/top factory study, the ILC Technology Network kick-off, and the setting up of Detector R&D collaborations (to pick just a few). We look forward to how these activities will shape the field, for example the upcoming update of the European Strategy for Particle Physics.

Join us in Tokyo to discuss these developments and work towards our future, in a wide ranging program of plenary, parallel, and poster sessions.

For details, visit <https://agenda.linearcollider.org/e/lcws2024>.

Registration and abstract submission will open in early 2024.

VIDEO OF THE WEEK

Shoji Asai goes science festival: ILC lecture and workshop with young science fans at Science Agora 2023

[Rika Takahashi](#) | [27 November 2023](#)

On 19 November, Shoji Asai, Spokesperson for ILC-Japan, together with Shunki Sugai, a popular Japanese science communicator on YouTube, presented a lecture and workshop for young science enthusiasts at “the [Science Agora](#),” Japan’s one of the biggest science festival held in Tokyo.

A group of 24 participants, ranging in age from 10 to university seniors, attended the workshop with an audience of about 150 people. The archived footage of the event has already been viewed over 13,000 times in one day.

重さはどうやってうまれたのだろう？【イベント生中継】

