

# LC NEWSLINE

THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

## DIRECTOR'S CORNER



## A year with the ILC

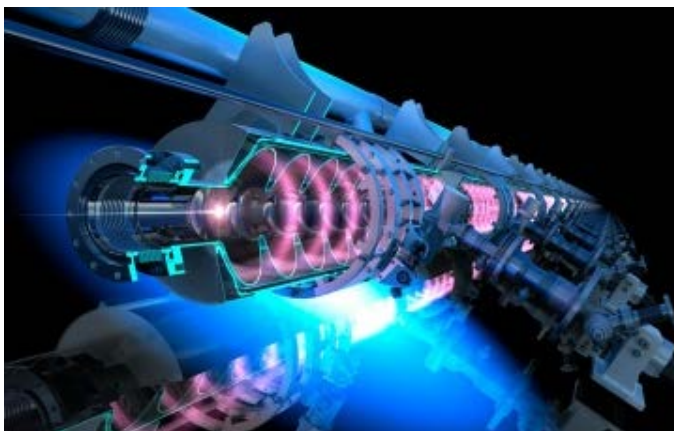
by Mike Harrison

For the ILC, 2014 was a year of progress in many areas, but the most important activities were centred in Japan, where Japan's Ministry of Education, Culture, Sports, Science and Technology has started deliberations to evaluate the physics justification as well as the scope and cost of the project. The past year also featured nice results from the ATF2 facility in Japan and the XFEL in Europe. Mike Harrison, associate director for the International Linear Collider in the Linear Collider Collaboration, didn't avoid the temptation to look back before looking ahead to 2015.

## FEATURE

## Register now for a different and fun linear collider meeting

by Rika Takahashi



Register now for a new style of Asian regional linear collider workshop, ALCW 2015! ALCW to be held in Tsukuba and Tokyo, Japan.

## VIDEO OF THE WEEK

## The ILC blues

by Perrine Royole-Degieux



This week we're pleased to present you a rather original message submitted on our Youtube channel to support the ILC project. Featuring P. Q. Hung, Professor of Physics, with the participation of Duong Quoc Dat, Graduate student, both from the University of Virginia, US. You too can contribute (even if you don't sing!) by participating in the #mylinearcollider video campaign.

## IMAGE OF THE WEEK



## A kimono for a laboratory

by Barbara Warmbein

The mayor of **Ichinoseki** city, Osamu Katsube, and the whole city sent a special gift to CERN for its 60th birthday, which it celebrated in 2014: a red chanchanko set. It consists of a red vest, hat and folding fan. "Kanreki" is one of the ancient traditions of celebrating longevity. It is held to celebrate the long life and health of someone who has reached a certain age and to pray for their continued health. This age is 60 years," the mayor explains in the accompanying letter. "We wish CERN further progress with its motto 'Science for Peace'."

[Find out more about the tradition](#)

## IN THE NEWS

from **ibc News**

6 January 2015

[達増理事 | ILC誘致と震災復興に取り組む](#)

達増知事は6日、今年最初の定例記者会見に臨み、改めて、震災からの復興の推進や、ILC＝国際リニアコライダーの誘致に向け取り組む姿勢を強調しました。(Iwate Prefecture Governor Tatsuya Tasso said in the press conference on 6 January that he will promote the activities toward the recovery from the earthquake and invite the ILC to Japan.)

from **Iwate Nippo**

4 January 2015

[次代の「国際人」育成に一助 2月、若者にセミナー](#)

県国際交流協会（は2月、高校、大学生を対象にしたセミナー「いわて青年国際塾」を開く。国際リニアコライダー（ILC）の誘致が実現すると、本県に移住してくる研究者やその家族ら多くの外国人への対応が想定されることから、次代を担う「国際人」育成の一助と位置付ける。(Iwate International Association will hold a seminar for high school and university students in February. Many scientists and their family are expected to live around the area once the ILC project is approved. This seminar aims to nurture more internationally-minded younger generation to prepare for the ILC construction.)

from **BBC News**

31 December 2014

[What science stories will be big in 2015?](#)

To help ring in the new year, the BBC's science and environment journalists weigh in on the blockbuster stories heading our way in 2015.

from **nature**

30 December 2014

[What to expect in 2015](#)

The long wait is over: the Large Hadron Collider (LHC) will reboot in March after a two-year shutdown.

from **Basler Zeitung**

29 December 2014

[Was die Wissenschaft 2014 bewegte](#)

Sie wollen ebenfalls den grössten Beschleuniger beherbergen – mit einem Speicherring, der 80 Kilometer Umfang hat. Und in Japan ist der weltweit grösste Linearbeschleuniger geplant, der 31 Kilometer lange International Linear Collider (ILC). Alle Projekte dürften Kosten im zweistelligen Milliardenbereich verursachen.

from **Iwate Nippo**

26 December 2014

## 英語環境の整備急務 ILC誘致、一関の団体が市に提言

一関地方の異業種交流団体・両磐インダストリアルプラザは、国際リニアコライダー（ILC）に関連するまちづくり座談会の報告書をまとめ、25日、勝部修市長に提出した。報告書は、ILC建設を見据え、▽教育▽食と文化▽魅力の3分野で課題と対策を提案。(A cross-industrial association in Ichinoseki, Iwate, Ryoban Industrial Plaza, compiled a report on the city development associated to the expected construction of the ILC, and handed it to Ichinoseki Mayor, Osamu Katsube. The report pointed out the issues in education, culture and food, and attractiveness of the area, and proposed some solutions.)

from *Tanko Nichi Nichi*

24 December 2014

### ILC誘致と理解構築 その本気度は？（2014報道回顧）

The plan of the international conference in Ichinoseki and Oshu should have been communicated with local residents in the early stage. The public understandings toward the realization of the ILC won't be gained only by the lectures and classes. The key for success would be how much attention paid to the local people. the efforts not to build the emotional barrier between scientists/administration and local citizen are expected.) 国際会議の開催は、いち早く市民に周知されるべきだったのではないか。ILC計画の実現に向けた市民理解は、何も講演会や出前授業の開催だけで築かれるものではない。日ごろから市民を意識し、丁寧に心を配っているのが鍵を握るのだろう。研究者・行政サイドと市民サイドとの間に見えない心の壁をつくらぬよう努めてほしい。

## CALENDAR

### Upcoming events

#### SiD Workshop

SLAC, California, USA

12- 14 January 2015

#### CLIC Workshop

CERN, Switzerland

26- 30 January 2015

[View complete calendar](#)

## PREPRINTS

### ARXIV PREPRINTS

[1412.8664](#)

A Three-Loop Neutrino Model with Global U(1) Symmetry

[1412.8572](#)

Probing the Top Quark Flavour-Changing Neutral Current at a Future Electron-Positron Collider

[1412.8480](#)

Observable Effects of General New Scalar Particles

[1412.7745](#)

Warm Dark Matter in Two Higgs Doublet Models

[1412.5905](#)

Single Higgs boson production at the ILC in the left-right twin Higgs model

[1412.5766](#)

The LHC Higgs Boson Discovery: Implications for Finite Unified Theories

[1412.5392](#)

Higgs boson decay to charm pair at full one-loop level in the MSSM with flavour violation

[1412.5157](#)

NLO electroweak automation and precise predictions for  $W$ +multijet production at the LHC

[1412.4789](#)

The Relic Neutralino Surface at a 100 TeV collider

[1412.4226](#)

Neutrinos, a window on new physics

[1412.3107](#)

Precision Natural SUSY at CEPC, FCC-ee, and ILC

[1412.3004](#)

Laser Wire Scanner Compton Scattering Techniques for the Measurement of the Transverse Beam Size of Particle Beams at Future Linear Colliders

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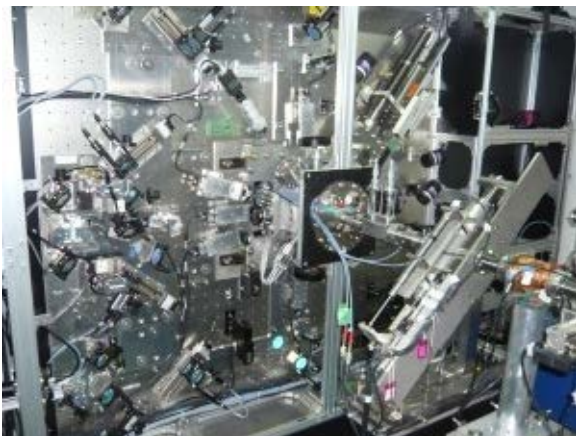
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## DIRECTOR'S CORNER

### A year with the ILC

Mike Harrison | [8 January 2015](#)



*The Shintake monitor at ATF2. Image: KEK*

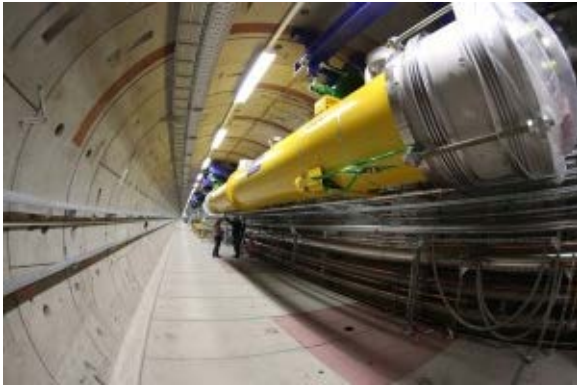
At this time in the calendar it is difficult to avoid the temptation to look back at the past year and ahead to the upcoming one. I have proved unable to successfully fight that impulse so the first Directors Corner of 2015 involves some personal observations and conjectures both past and future.

For the ILC, 2014 was a year of progress in many areas, but the most important activities were centered in Japan. Following the ILC *Technical Design Report*, which addressed the major technical issues, the question of how and where the ILC might be realised became a topic that could no longer be ignored. As such it was encouraging to see the Japanese political process engage in a comprehensive fashion to answer the question of whether Japan should prepare for the possibility of hosting the ILC. Given the scope and resources necessary for such a large project, the subject requires very careful scrutiny. Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) was charged to evaluate the physics justification as

well as the scope and cost. These deliberations took place throughout 2014 and involved many presentations and question-and-answer sessions by our Japanese HEP colleagues. This process is now in its final stages and a "wise man" council within MEXT is now preparing their final decisions on the subject. Hopefully their analysis results in a positive recommendation.

The machine design evolved in 2014 to reflect the preferred site at Kitakami. This step is a high priority and necessary to specify the conventional construction layout. A design for the experimental hall has been adopted which involves a vertical shaft as the principle access. Fixing the experimental hall layout allows the detector design work to progress unimpeded but in addition serves to help specify an acceptable topology, hence location, for the interaction point. A proposal to make the final-focus layout identical for both detectors was accepted and is presently wending its way through the change control process. In addition to the Detector Hall, collision point timing constraints also provide criteria to define the tunnel length. The exact tunnel length is a combination of the damping ring circumference, bunch spacing, and overall path length. Once fixed, the tunnel length also serves to specify the SCRF accelerating gradient, the location of the cryogenic penetrations and the linac end location. A tunnel length proposal is now under active consideration by the Change Management Board. Thus many of the fundamental machine features are now close to finalisation; the site-specific design is starting to take shape.

Another notable feature of 2014 was cryomodule production for the European XFEL project. While superconducting radiofrequency (SCRF) technology was well demonstrated during the Global Design Effort phase, it is a demanding process and mass production is expensive enough that only a construction project would have the necessary resources to verify large-volume production. 2014 was the year when cavity and cryomodule production rates for the first time achieved the kind of levels needed for the ILC programme. Thank You XFEL!



*Installation of Test Module XM-2 in the tunnel of the European XFEL. Image: DESY*

Finally in 2014, the Accelerator Test Facility at KEK, Japan (ATF2) demonstrated the complex optics of the beam delivery system in [achieving a 38-nanometre vertical spot size in a final focus scenario](#). A linear collider, as a single-pass device, relies on ultra-small beam sizes to produce the desired luminosity. This in turn requires a very complicated system of optics. The ATF2 facility has been in operation for several years, making the kind of steady progress which has finally resulted in the validation of the TDR design concepts and tuning algorithms. This work is not over yet however, with further work needed in regard to beam intensity effects and feedback system stability. Nonetheless 2014 was a year of great progress for the ATF2 team.

Looking ahead to 2015 we can anticipate another interesting year in many regards. The most obvious item will be the start of the Large Hadron Collider Run 2 in the spring. Run 1 brought us the Higgs discovery, and Run 2 will be

at the significantly higher collision energy of 13 TeV and increased luminosity. Obviously it is impossible to predict the results which will arise from this next phase of operations but it does have the possibility of impacting the ILC parameters in a fundamental way. A new discovery would probably be reflected in some form of optimisation of the ILC design parameters. Only time will tell but we should start to see the first new LHC physics results by the end of 2015.

I also expect to see further progress in Japan towards formulating a decision in regards to an ILC project. As well as domestic considerations, increased international negotiations will surely form a part of these activities as this next phase starts. A consensus environment inevitably results in a multi-step process. We are well along this path but we are at the point where increased internationalisation needs to progress beyond the HEP community and into the political one. This will introduce another series of challenges to be faced in 2015, traditionally at least as difficult than the technical ones. As we were reminded by Kawamura-san, chair of the Federation of Diet members to promote the construction of an international laboratory for the linear collider in his [message at the Tokyo workshop](#) in 2013, politicians' expertise in physics is only rivaled by physicists' expertise in politics.

On the technical side of things, 2015 will see the completion of XFEL cryomodule production, allowing the full production data set to allow the illumination of such issues as degradation – the loss of cavity gradient when placed in a cryomodule – where sufficient statistics were heretofore lacking. The site-specific design work will continue and I expect the first complete ILC footprint using the Kitakami site. Slowly resources are accreting into the project and hopefully 2015 will see work resume in the positron system and damping rings area and continue in the other sub-systems.

So we enter 2015 knowing that this will be a very important year in many ways in the evolution of the ILC. I expect that we will emphasise the international part of the name and a significant feature of the activities will be political. As always, only time will tell how the programme will unfold.

[ACCELERATOR R&D](#) | [ATF2](#) | [CHANGE CONTROL BOARD](#) | [DETECTOR R&D](#) | [EUROPEAN XFEL](#) | [JAPAN](#) | [KITAKAMI SITE](#) | [LHC](#) | [MDI](#) | [MEXT](#)

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## FEATURE

### Register now for a different and fun linear collider meeting

Rika Takahashi | [8 January 2015](#)

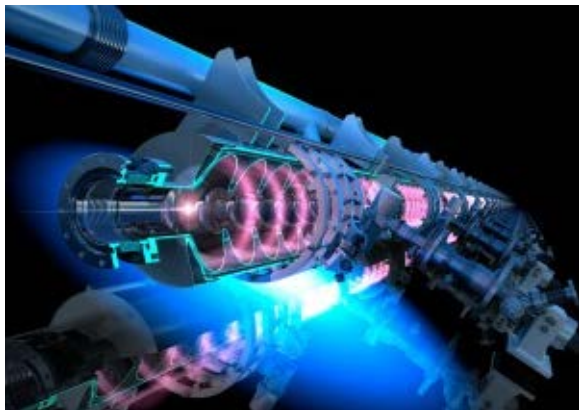


Image: Rey. Hori

International conferences and workshops related to the linear collider are traditionally held twice a year: one global meeting, and another regional one. Next April, a new style of Asian regional linear collider workshop will be held in Tsukuba and Tokyo, Japan.

The [Asian Linear Collider Workshop 2015 \(ALCW2015\)](#) will take place from 20 to 24 April 2015. This workshop will be devoted to accelerator, physics and detector aspects of future high-energy electron-positron linear colliders.

What is different about this workshop? This workshop is the first Asian regional workshop since the start-up of Linear Collider Collaboration. Being different from the past regional workshops in Asia this workshop is co-organised by KEK, ACFA, and LCC, and a new session organisation is attempted: the detector sessions consist of several mini-workshops of detector concept and R&D groups.

ALCW2015 is also different because it will be held in two cities – Tsukuba and Tokyo. The the middle day of the workshop, Wednesday 22 April, will be a special day in Tokyo. Because the workshop is being organised at a critical time for the ILC project development in Japan, it will have a special focus on the ILC progress in Japan. And, this Tokyo event will not only be open for the AWLC participants, but for anybody who is interested in the development of the linear collider project.

In the morning of 22 April, there will be a special plenary session of the ALCW workshop. In the afternoon, a special symposium will be held where you can catch the latest news about moves towards the realisation of the ILC with invited speakers from various fields. After the symposium will be a banquet of a special kind – the taste of TDR, with booths offering local specialities from as many countries represented in the TDR signatories list as possible. The organisers are now trying hard to find as many caterers of different cuisines as possible. This food festival also serves as a public outreach event to which schools, local residents, industry.

Details of the event will be announced in the workshop webpage: [www-conf.kek.jp/alcw2015/index.html](http://www-conf.kek.jp/alcw2015/index.html)

Registration for ALCW is now open: [www-conf.kek.jp/alcw2015/registration.html](http://www-conf.kek.jp/alcw2015/registration.html)

We hope to have as many participants as possible in Tokyo and accelerate processes to launch the ILC project. Let's get together in Tsukuba and Tokyo !

[ACCELERATOR R&D](#) | [ALCW2015](#) | [DETECTOR R&D](#) | [FOOD FESTIVAL](#) | [OUTREACH](#)

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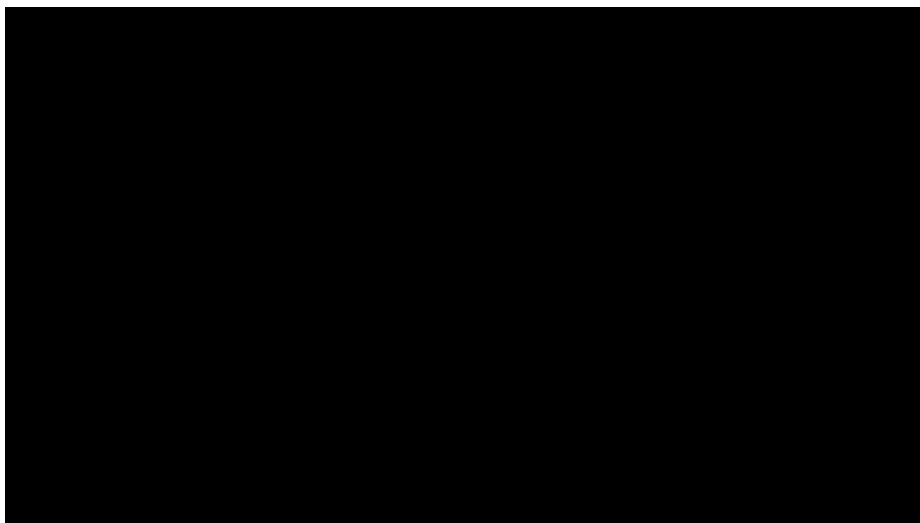
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## VIDEO OF THE WEEK

### The ILC blues

[Perrine Royole-Degieux](#) | [8 January 2015](#)

This week we present another very inspired testimony of support for the ILC. Enjoy this exclusive version of what we named “The ILC blues”, from P. Q. Hung, Professor of Physics at the University of Virginia, USA, Honorary Professor, Hue University College of Education, Vietnam with the participation of Duong Quoc Dat, Graduate student at the University of Virginia.



The Linear Collider Collaboration is actively reaching out to its collaborators and supporters to participate in the #mylinearcollider video campaign. The series of short, informal videos is posted on our [ILC Youtube channel](#) and will be shared with the relevant committees and organisations in the world.

You don't need to sing... but your message will really make difference. [Participate in the #mylinearcollider video campaign](#), and ask your colleagues and friends to join, too!

[MYLINEARCOLLIDER](#) | [SONG](#)

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## IMAGE OF THE WEEK

### A kimono for a laboratory

Barbara Warmbein | [8 January 2015](#)



*Akira Yamamoto, Asian Director for the ILC in the Linear Collider Collaboration, hands the gift over to Rolf Heuer, Director General of CERN. Image: CERN.*

The mayor of [Ichinoseki](#) city, Osamu Katsube, and the whole city sent a special gift to CERN for its 60th birthday, which it celebrated in 2014: a red chanchanko set. It consists of a red vest, hat and folding fan. “Kanreki” is one of the ancient traditions of celebrating longevity. It is held to celebrate the long life and health of someone who has reached a certain age and to pray for their continued health. This age is 60 years,” the mayor explains in the accompanying letter. “We wish CERN further progress with its motto ‘Science for Peace’.”

Find out more about the tradition here: [www.e-shrine.org/kanreki.html](http://www.e-shrine.org/kanreki.html)

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