NEWSLINE
THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

FEATURE

Linear collider technology checks LHC lumi

by Barbara Warmbein

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AROUND THE WORLD

Tokyo event during ALCW: Taste of Discovery

by Rika Takahashi

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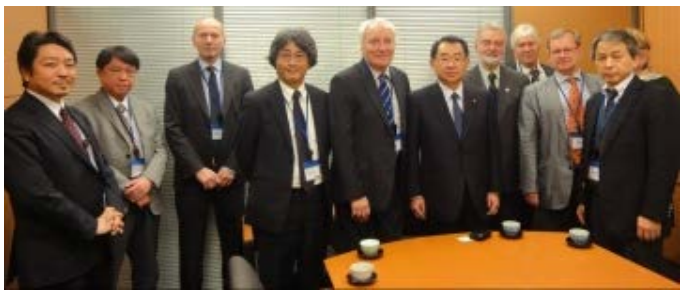
DIRECTOR'S CORNER

Towards global political support

by Hitoshi Murayama



Who are the counterparts to the Japanese Federation of Diet members in support of the ILC? What are the timescales for other future collider projects like FCC and the muon collider? LCC Deputy Director Hitoshi Murayama says the physics community should stay focused, consistent, and strategically uniform if it wants to convince decision makers to support the ILC.

VIDEO OF THE WEEK

Altogether now: ILC! #mylinearcollider

by Perrine Royole-Degieux

This video of support for the ILC was recorded during the latest project meeting of ATF2 which took place from 24 to 26 February 2015 at LAPP laboratory in Annecy, France. Your message really makes difference. Participate in the #mylinearcollider video campaign, and ask your colleagues and friends to join, too!

IN THE NEWS

from ***New Scientist***
4 March 2015
Opinion: Will the revamped LHC make or break physics?
But there are alternatives. Some argue that messy collisions between protons are not the ideal way to find physics beyond the standard model. Plans already exist for more precise electron colliders – from the International Linear Collider, which might be built in Japan, to a circular collider at CERN up to 100 kilometres long – far bigger than the LHC.

from ***Nature***
4 March 2015
Developing world: The minority minority
Women are under-represented in physical sciences and in science in the developing world. Meet three who beat both sets of odds.

from ***The Shorthorn***
20 February 2015
'It's all because of physics': an interview with Michio Kaku
Before taking the stage, Kaku spoke with The Shorthorn in an interview about his experiences as a burgeoning scientist, his thoughts on the unanswered questions of science and his biggest fear for the future of humanity.

CALENDAR

Upcoming events

ALCW2015
KEK and Univesity of Tokyo, Japan
20- 24 April 2015

Upcoming schools

Joint Universities Accelerator School (JUAS)
Archamps, Haute Savoie, France
12- 20 March 2015

View complete calendar

PREPRINTS

ARXIV PREPRINTS

1502.07970
Off-shell effects in Higgs processes at a linear collider and implications for the LHC

1502.07716
Fingerprinting the extended Higgs sector using one-loop corrected Higgs boson couplings and future precision measurements

1502.07197
Multi-Higgs models. Perspectives for identification of wide set of models in future experiments at colliders in the SM-like situation

1502.07032
PeV Scale Right Handed Neutrino Dark Matter in S4 Flavor Symmetric extra U(1) model

1502.06955
A Quartz Cherenkov Detector for Compton-Polarimetry at Future e+e- Colliders

1502.06877
A longitudinal study of field emission in CEBAF's SRF cavities 1995-2015

1502.06445
Sources of Charged Higgs Pair Through Double or Triple Higgs Production in Two Higgs Doublet Model Type II at Linear Colliders

1502.05915
Testing sterile neutrino extensions of the Standard Model at future lepton colliders

LC NEWSLINE
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Linear collider technology checks LHC lumi

Barbara Warmbein | 5 March 2015

The luminometer was installed in the CMS detector in January. Image: CERN

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The luminometer, part of the beam radiation instrumentation and luminosity (BRIL) project at CMS, consists of the so-called pixel luminosity telescope PLT and another part called BCM1F. It's the BCM1F, a DESY-CERN coproduction, that has its roots in the forward calorimeter. The forward calorimeter is located in a tough area that needs radiation-hard equipment in order to survive. Already several years ago the FCAL collaboration tested several different technologies and settled on diamond sensors. It was actually during one of the test beam periods at CERN that the collaboration for the CMS luminometer was born when the LC FCAL started chatting to CERN experts on beam halo monitoring.

Radiation-hardness isn't the only thing that sets the BCM1F lumi tool apart: its sensors use diamond crystals that deliver ultra-short signals when a particle passes through. The application-specific integrated circuit (ASIC) to amplify the signal, developed and commissioned by a team from AGH-UST Cracow, CERN and DESY (Zeuthen), takes only a few nanoseconds to be back online, making it possible to count particles that pass through at very short intervals. Physics can deduce whether the particle comes from a collision or from beam background based on the time they passed through.

The luminometers were installed in CMS in January. The setup consists of two semi circles with an outside radius of 10 centimetres. They sit at 1,8 metres distance from the interaction point and, once the LHC starts up again, send their information about luminosity and particle count from the beam-induced background to the CMS and LHC control rooms every second.

The BCM1F sets itself apart thanks to diamonds and speed. Image: Wolfgang Lohmann, DESY

Meanwhile, over at the linear collider's FCAL, the FCAL collaboration will use the experience acquired in the operation of the CMS luminometers in the LHC's run 2 for the construction of prototypes of forward calorimeters. ASICs experts will get to work on FCAL-specific integrated circuits with the help of funds from the AIDA2020 programme. So in true particle physics cross-fertilisation tradition the technology that started in the linear collider community will give its first performance in the LHC only to to be developed further with the experience gained from that first performance.

The BRIL collaboration. Image: CERN

AIDA2020 | ASIC | DETECTOR R&D | FCAL | ILC | LHC | LUMINOSITY

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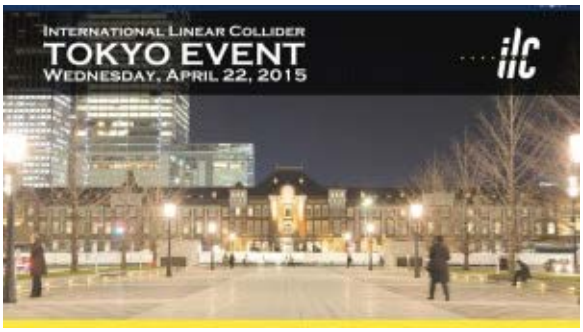
Rika Takahashi | 5 March 2015



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Organisers are working hard to plan and prepare for the events to provide very special experiment in Tokyo. Some exciting plans are on the list, and will be announced when they are ready. Please don't miss the opportunity to attend this important moment for the ILC toward its realisation.

Discussions whether Japan would host the International Linear Collider Project are ongoing at government level, and the ALCW2015 happens at a critical time. It is very important for the community to show its enthusiasm and support for the project, so if you are not yet registered for the ALCW, register now! Registrants for the ALCW2015 will get a entry pass for both symposium and food festa. The symposium is open for public (registration form is under preparation). Sign up to catch up the latest news on the ILC.

See you in Toyo!

ALCWS

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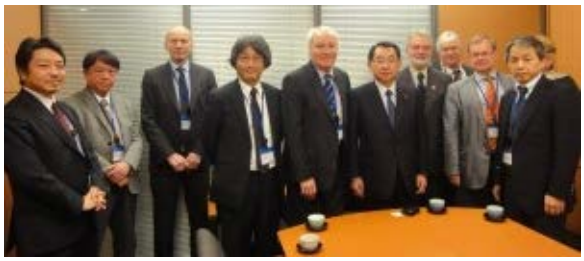
DIRECTOR'S CORNER

Towards global political support

Hitoshi Murayama | 5 March 2015

When the LCC visited the Tohoku region in January, we had an opportunity to see a couple of Diet members and their staff. One of them was very succinct about the problems concerning ILC. He pointed out that the *Federation of Diet members to promote a construction of international laboratory for LC* boasts more than 20% of the Diet members. And if the ILC would come to the floor, there was no question whether it would pass; that is not the problem, he said. Instead, he saw two other problems.



Discussions with the chair of the Federation of Diet members yielded some surprising results. Image: Rika Takahashi, KEK

The first problem is the lack of global political support. The ILC is supposed to be an international project, and Japanese politicians by themselves cannot make it happen. He expressed frustration about not being able to identify counterparts in other nations to work together towards the realisation of the project. We explained that LCC members have been working with funding agencies in respective countries, but it is hard to go beyond that.

At the end of the day, a clear idea emerged. Mr. Ryu Shionoya, the General Director of the Federation will visit Washington DC to meet some of the US policymakers to start conversations about the ILC. He is the No.2 in the hierarchy of Liberal Democratic Party's Policy Research Council, which is responsible for the policymaking. It is already official and scheduled to be from 30 April to 1 May. A detailed agenda is being put together. It is only the beginning of the conversation, but it needs to start somewhere. I was so impressed by the will of Mr. Shionoya and *Federation* for the realisation of ILC. I very much hope there will be similar conversations with other countries.

The second problem are the "mixed messages" from the scientific community. We keep talking about various possible future machines or different scientific objectives. It is the nature of us scientists. We speak up freely, express our minds and opinions, argue and debate on just about anything. But from the outside, it is difficult to understand. The timescales under discussions are very different for, say, ILC vs FCC vs muon collider. It is understood within the community, but it is not clear to those who are not part of our community.

I've learned that we have to be much more careful in what we say. As the project comes closer to the decision point, inevitably there will be no noise and scrutiny. We as the community need to find a way to stay focused, consistent, and strategically uniform.

Meanwhile, committees under MEXT are doing their work to evaluate both science and feasibility, and I'm hearing that the process is progressing very well. From what I understand, this type of committees is an official undertaking by a governmental ministry, and has a totally different character from the study done by Science Council of Japan, which is completely bottom-up. I was initially worried that having more committees meant a delay tactics, but my friends in Japan tell me that it is not the case. The fact that the government entity is officially engaged in the ILC matter should be viewed as a major progress, they say.

Everything takes time, but I hope eventually things will converge. It is moving forward. And we should use what we scientists are the best at: remain optimistic. Meanwhile, it is not too late to join #mylinearcollider campaign to show your support publicly!

FEDERATION OF DIET MEMBERS | ILC HOSTING | JAPAN | MEXT

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ATF2 is a test facility at the KEK laboratory in Japan which contains a prototype of an advanced optics design of the final focus for use at any future linear collider. (Read more about ATF2 latest news in *LC NewsLine*). ATF2 collaborators meet twice a year for their project meeting, traditionally once at KEK in Japan and once outside.

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 (535 posted online to date) is posted on our ILC Youtube channel and will be shared with the relevant committees and organisations in Japan that are overseeing the evaluation process.

Your message really makes a difference. Participate in the #mylinearcollider video campaign, and ask your colleagues and friends to join, too!

Photo: CNRS/LAPP, Sophie Lieunard.

ATF2 | FJPPL | FRANCE | JAPAN | MYLINEARCOLLIDER