

# LC NEWSLINE

THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

## DIRECTOR'S CORNER

### The CLIC 2014 workshop at CERN

by Steinar Stapnes



As the worldwide linear collider community comes together during the LCWS 2013 meeting in Tokyo next week, the CLIC collaboration has already started to plan their next major event, the **2014 CLIC workshop** at CERN from 3 to 7 February. Steinar Stapnes, Associate Director for the Compact Linear Collider Study, reports.

## FEATURE

### From concept to consortium

SiD workshop at SLAC

by SiD spokespersons Marcel Stanitzki and Andy White



The SiD detector concept held a workshop at SLAC from 14 to 16 October. This was the first workshop held since the

completion of the Detailed Baseline Design document and was an opportunity to consider the next steps in detector development and organisation of the concept. The workshop agenda can be found [here](#).

## AROUND THE WORLD

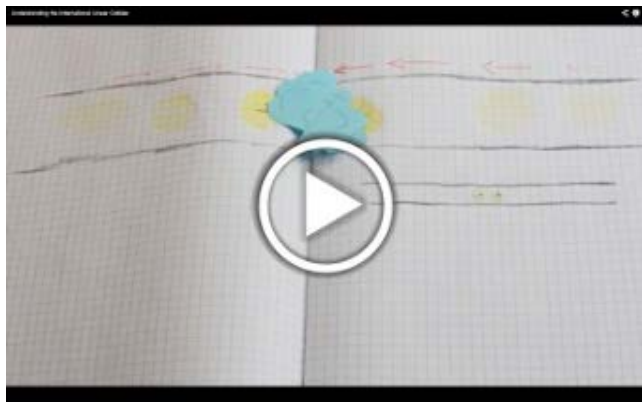
### Running like an electron

by Barbara Warmbein



Hundreds of children (as well as some playful adults) turned into human electrons at the ILC exhibit for the German accelerator lab DESY's Open Day on 2 November in a mini ILC.

## VIDEO OF THE WEEK



## Understanding the ILC (hand-made animation inside)

Credit: University of Texas-Arlington

A nice hand-made animation explains why a linear collider is needed to study the Higgs particle in great detail. Enjoy the description of the ILC machine "and then BOOM... science".

## IN THE NEWS

from **ScienceGuide**

6 November 2013

[Kernonderzoek met Europees smaakje](#)

Wat is de toekomst van het fameuze CERN? Heeft het een antwoord op de plannen voor de International Linear Collider die hoogstwaarschijnlijk in Japan gebouwd gaat worden? De Japanse overheid is bereid de helft van de kosten voor zijn rekening te nemen, dus er komt flink beweging op dit terrein op wereldschaal.

from **CNN.com**

5 November 2013

[International Linear Collider will search for 'unifying theory of everything'](#)

STORY HIGHLIGHTS

The International Linear Collider aims to "discover an overarching theory of everything"

The vast new facility will increase understanding of the Higgs Boson, commonly known as the "God particle"

Research into the particle led to the awarding of this year's Nobel Prize in Physics

from **UTA The Shorthorn**

30 October 2013

[UTA helps plan new linear particle collider](#)

UTA is involved in planning the next large-scale machine to further study the Higgs boson.

from **Market Watch**

28 October 2013

[Studiul defectelor induse de iradiere, primul pas spre creșterea rezistenței la radiație a detectorilor de Si utilizați în experimentele LHC](#)

Această tematică de cercetare a INCD pentru Fizica Materialelelor (INFM) este strâns legată de colaborarea cu CERN, prin intermediul proiectului RD50, și este motivată în principal de provocarea impusă de noile acceleratoare de particule ca Large Hadron Collider (LHC), operabil în prezent la CERN, precum și de upgradarea viitoare a acestuia (SLHC), International Linear Collider (ILC) sau de sursele de fotoni cu brilianță mare, ca XFEL, prevăzute și ele pentru acest deceniu.

## CALENDAR

Upcoming events

[LCWS 2013](#)

The University of Tokyo, Japan

11- 15 November 2013

[ILC Tukasui Workshop 2013](#)

KEK

17- 19 December 2013

## ANNOUNCEMENTS

**Rendez-vous at the Journées Collisionneur Linéaire**

The 2013 CEA/Irfu Linear Collider Days organised jointly with CNRS/IN2P3 will take place at CEA Saclay in Building 526 Amphitheatre Joliot Curie from 27 to 29 November. This will be the second "Journées Collisionneur Linéaire" of the French community, following the first event organised in Lyon on 13-14 May 2013.

## Upcoming schools

[Eighth International Accelerator School for Linear Colliders](#)  
Antalya, Turkey  
4- 15 December 2013

[View complete calendar](#)

## PREPRINTS

### ARXIV PREPRINTS

[1311.0067](#)

Higgs Pair Production at the LHC and ILC from general potential

[1310.8361](#)

Higgs Working Group Report of the Snowmass 2013 Community Planning Study

[1310.7098](#)

Charged Higgs Pair Production in a General Two Higgs Doublet Model at  $e^+e^-$  and  $\mu^+\mu^-$  Linear Colliders

[1310.6183](#)

Laboratory studies of THGEM-based WELL structures with resistive anodes

[1310.5881](#)

Testing Higgs Physics at the Photon Collider

The goal of the meeting is to discuss the roadmap for the future French linear collider activities in the areas of physics and phenomenology, detector and accelerators technologies.

Special attention will be devoted to the discussion of the future technological and engineering efforts needed for the timely ILC realisation and to the connections established with our worldwide partners. For more information please consult the [meeting website](#).

### European ILC informal discussion

In conjunction with the French Linear Collider days, the Linear Collider Collaboration (LCC) is organising an “Informal Discussion” about the current status of EU projects, in particular the future EU Horizon-2020 call and its implications for the ILC community. The meeting should include a few representatives from each European country. It will take place on Friday, 19 November (14:00-18:00); a [special Indico page](#) has been setup for this event.

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## The CLIC 2014 workshop at CERN

Steinar Stapnes | [7 November 2013](#)



*Artist's impression of the CLIC accelerator at the foot of the Jura mountains. Image: CERN*

As the worldwide linear collider community comes together during the LCWS 2013 meeting in Tokyo next week, the CLIC collaboration has already started to plan their next major event, the [2014 CLIC workshop](#) at CERN from 3 to 7 February.

The yearly CLIC workshop brings together accelerator, detector and physics experts directly involved or connected to the CLIC project development. A large emphasis is put on presentations by young researchers, students and postdocs. In the 2013 workshop almost 300 participants and around 150 presentations demonstrated the vitality of the ongoing efforts and the important contribution of the young researchers in the CLIC studies. The 2014 workshop will follow the model from 2013, covering accelerator as well as detector and physics studies, addressing both the present status and the programme for the coming years. For the accelerator studies the workshop spans over five days, from 3 to 7 February, while for the detector and physics studies the workshop spans over 3 days, 3 to 5 February.

In addition to the obvious links to ILC activities and project development, the CLIC project is also engaged in an increasingly focused effort towards developing options for future higher-energy machines at CERN after the LHC. The major options for hadrons and leptons, a higher-energy LHC in the existing tunnel or in a new 80-100 kilometre tunnel, or a linear collider based on CLIC technology, are supposed to be developed as options towards the next European Strategy update in five years time. Related to this overall framework, the CLIC workshop will start on Monday afternoon with an open plenary session giving an overview of the CLIC project (accelerator, physics/detector) and linking to and involving related studies for machines at the energy frontier.

In the dedicated Accelerator and Detectors/Physics parallel sessions on Tuesday and Wednesday numerous collaboration presentations will cover all the activities inside the accelerator and detector/physics studies. Several accelerator streams will be run in parallel, covering parameters and design, X-band technologies, experimental verifications and system tests, implementation studies with particular focus on energy/power efficiency, including joint sessions as needed between the above. The technical development projects and presentation will be distributed on these sessions to encourage interactions between the developers and users/specifiers. Other parallel sessions will cover detector studies, R&D and associated physics studies. An Institute Board meeting on Tuesday evening will allow the more formal aspects of the detector and physics activities to be discussed.

There is an increased effort inside the CLIC project to look how various aspects of the CLIC technology can be used in applications outside particle physics, and consequently increase the industrial base for key elements of the technology. Such developments are highly encouraged by several of the CLIC collaboration partners as well as our industry partners, and we will therefore include a dedicated

session in the CLIC workshop covering high gradient normal-conducting accelerators for industrial and medical applications as well as XFELs, using CLIC and other high-gradient technology developments. A similar session in January 2013 was very successful and well attended.

The workshop will be wrapped up by a plenary session on the Friday morning focusing on existing and future system tests addressing key CLIC project challenges. The open meetings are followed by a CLIC collaboration meeting Friday afternoon to discuss the main collaboration matters, and also allowing all the partners to raise particular issues relevant for their effort and future planning.

On the social side there will be reception Monday evening and a workshop dinner on Wednesday evening. After LCWS 2013 in Tokyo you are all welcome to CERN in February, and the [registration](#) opened already this week.

[ACCELERATOR R&D](#) | [CERN](#) | [CLIC](#) | [DETECTOR R&D](#)

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## FEATURE

### From concept to consortium

#### SiD workshop at SLAC

SiD spokespersons Marcel Stanitzki and Andy White | [7 November 2013](#)



*The members of SiD detector concept are taking steps to become a fully established collaboration. Image: Jim Brau*

The SiD detector concept held a workshop at SLAC from 14 to 16 October. This was the first workshop held since the completion of the Detailed Baseline Design document and was an opportunity to consider the next steps in detector development and organisation of the concept. The workshop agenda can be found [here](#).

The next phase for SiD will be known as the “SiD Consortium”. It is intended to be a step towards an eventual full collaboration to construct and operate the SiD detector at the ILC. The SiD Consortium has two spokespersons, an Executive Committee, and an Institute Board and will benefit from the appointment of several key individuals. The Institute Board is chaired by Phil Burrows from Oxford University; Jim Brau (U. Oregon) serves as R&D Coordinator, and Martin Breidenbach (SLAC) is the Technical Coordinator.

The Consortium has adopted a set of bylaws to guide its work. It was emphasised during the workshop that the SiD Consortium is open to any

institute or individual who is interested in SiD and would like to contribute to its development. To apply for membership, please send an email to the Institute Board Chair, [Phil Burrows](#).

At the workshop news from Japan was given by the LCC Associate Director for Physics and Detectors, Hitoshi Yamamoto. He gave details of the ILC site selection and discussed the recent statement by the Japanese Science Council concerning the ILC. The results of the Snowmass Community Study were presented by Michael Peskin from SLAC with his interpretation of the ILC moving forward. “The statement that the ILC physics case is very strong has been accepted by the Snowmass study,” his summary slide stated.

The second day of the workshop consisted of presentations of the latest R&D results with a focus on calorimetry. The first results from a beam test of a prototype silicon-tungsten electromagnetic calorimeter were presented, along with updates on the development of RPC-based digital hadron calorimetry and scintillator-based analog hadron calorimetry. Additional topics included the Chronopix vertex detector chip, forward calorimetry, pixel developments in the UK, and the gain stabilisation of silicon photomultipliers. On the final day of the meeting the current status of the Machine-Detector-Interface was reviewed by Marco Oriunno, also in-light of the site decision. Martin Breidenbach summarised the additional R&D, detector optimisation, and resources needed to write a “real” Technical Design Report for SiD, setting the scale of the work that will be required.



The next steps for SiD, possible detector optimisation, and further benchmarking were summarised by Andy White in his close-out talk. The meeting ended with a lively Spokesperson Question Time, with questions such as “How do we keep the momentum of SiD while we wait for an official announcement from Japan?” The answer: we study detector optimisation, recruit more collaborators, and argue for a detector part of an ILC budget in the U.S. and discussion about ILC political developments.

[DETAILED BASELINE DESIGN](#) | [DETECTOR R&D](#) | [SID](#)

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*Spokesperson Question Time with Marcel Stanitzki and Andy White. Image: Jim Brau*

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AROUND THE WORLD

## Running like an electron

Barbara Warmbein | [7 November 2013](#)

Hundreds of children (as well as some playful adults) turned into human electrons at the ILC exhibit for the German accelerator lab DESY's Open Day on 2 November. The group that normally takes care of linear collider technologies – cavity inspection, diagnostics, cavity treatments and the like – developed a mini particle accelerator for the event. A set of LEDs embedded in drawings of cavities in the walls of the eight-metre mock-up tunnel switched from red to green, telling people when to accelerate using the traditional method of running. They had to stay in phase with the green lights that accelerated towards the collision point – a big, soft mat with the drawing of an ILC event. Successful “electrons” received a packet of gummy bears. And there were many successful self-accelerated human electrons amongst the nearly 19,000 visitors at DESY's Open Day!



*A favourite at the DESY Open Day: an ILC tunnel experience using the traditional acceleration method of running. Image: DESY / Lars Berg*



*The linac in daylight. Image: DESY / Aliaksandr Navitski*



*Collision!*

Head designer of a team of about seven students and technicians of the mini ILC is Aliaksandr Navitski, DESY postdoc. “We wanted to show what acceleration is and how important it is to get the timing right,” he explains. “I think we succeeded – some kids stayed over an hour and accelerated again and again.” Even though kids repeating the tour sounds more like a storage ring, the idea is that of a linear collider and its radio frequency. The controls for the LEDs were matched to what a slow-motion ILC could be phased at and could be adjusted on the spot. The idea is to keep the setup, add measurements of speed and time and use it again in the future.

The acceleration game was one of many hands- and feet-on experiments and demonstrations on show at DESY's Open Day. Visitors could visit the tunnel of the European X-ray Free-Electron Laser XFEL, walk a mile underground in the HERA accelerator, learn about crystals or superconductivity, tomograph a kinder egg, drive an overhead crane or admire the heavy-duty DESY workshops. More than 100 activities kept the crowds busy from noon to midnight.

[ACCELERATOR RESEARCH](#) | [DESY](#) | [OUTREACH](#)

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