SLIDESHOW

Impressions from Daegu, Korea

This week, linear collider researchers meet in Daegu, Korea for KILC12. Among other topics, they discussed the final production stages of the Detailed Baseline Design and *Technical Design Report*. To top it all off, conference organisers are treating attendees to their choice of excursions through the vibrant city of Daegu.

AROUND THE WORLD

Test facility at KEK becomes an accelerator

by Rika Takahashi

KEK's superconducting radiofrequency test facility, called STF, has graduated. No longer a test facility, it is now a fully fledged accelerator.

DIRECTOR'S CORNER

On roadmaps and signposts

This week's issue features a Director's Corner from Brian Foster, Global Design Effort European Regional Director

by Brian Foster

Roadmaps, like many things in life, become outdated and eventually misleading and useless. The only way to avoid this is to update them when it is clear that the landscape has, or is about to, change significantly.

IN THE NEWS

from ***Smithsonian***
May 2012
Fast Forward: The Dark Energy Camera
A new project representing 23 scientific institutions is investigating this mysterious cosmic propellant, called dark energy. The centerpiece is the Dark Energy Camera, which will be operational in July after it is installed in the telescope at the Cerro Tololo Inter-American Observatory in Chile.

from ***physicsworld.com***
23 April 2012
Cosmic-ray theory gets the cold shoulder
One of the leading theories describing how the most energetic cosmic rays are produced may need a rethink in light of a new study by physicists at the IceCube Neutrino Observatory in Antarctica.

from ***My navi news***
23 April 2012
反物質世界は近くには存在しない – KEKらが日米共同宇宙線観測実験で実証
KEK、JAXA、東京大学の3者は、南極上空を周回する高高度気球(画像1)による合計1カ月以上に及んだ日米共同の宇宙線観測実験「BESS-Polar(ベスポーラー)」で、1～14GVのRigidity(運動量/電荷)の範囲内での宇宙線観測により得られた4800万例のヘリウム原子核の中から、反ヘリウム原子核は1例も観測されなかったと発表した。

from ***Iwate Nippo***
18 April 2012
ILCを地域のコアに 東京で高エネ研、宮原氏が講演
国際経済政策調査会（東京）主催の加速器科学研究会は１７日、東京・赤坂の会館で約１３０人が参加して開かれた。本県が誘致を目指す国際リニアコライダー（ＩＬＣ）計画の施設設計の現状について高エネルギー加速器研究機構（茨城県つくば市）特別技術専門職の宮原正信氏が講演。

CALENDAR

UPCOMING EVENTS

Joint ACFA Physics and Detector Workshop and GDE meeting on Linear Collider (KILC12)
Daegu, Korea
23- 26 April 2012

FCAL Workshop
DESY, Zeuthen
07- 09 May 2012

ILD Workshop 2012
Kyushu University, Fukuoka, Japan
23- 25 May 2012

15th International Conference on Calorimetry in High Energy Physics (CALOR 2012)
Santa Fe, New Mexico
04- 08 June 2012

UPCOMING SCHOOLS

The 2012 European School of High-Energy Physics
Anjou, France
06- 19 June 2012

View complete calendar

PREPRINTS

ARXIV PREPRINTS

1204.5668
Systematic improvement of QCD parton showers

1204.4853
WHIZARD @ LCForum 2012: A Status Report

1204.4579
The Higgs Portal from LHC to ILC

SLIDESHOW

Impressions from Daegu, Korea

26 April 2012

Images: Nobuko Kobayashi (meeting series), KILC12 (group photo) and Tsunehiko Omori (feast image)

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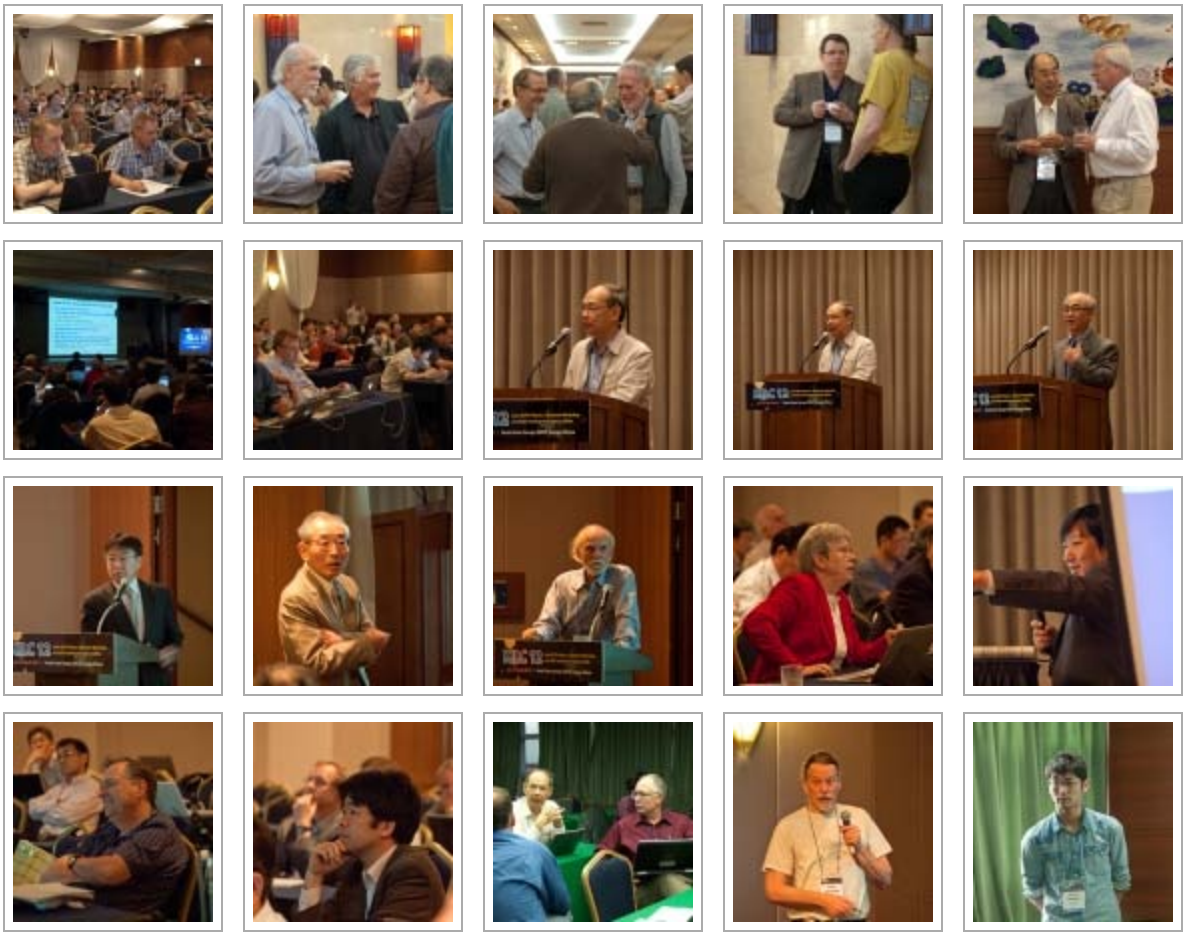
[Show as slideshow]














KILC12 | KOREA

AROUND THE WORLD

Test facility at KEK becomes an accelerator

Rika Takahashi | 26 April 2012

No longer a test facility, STF is now an operating accelerator. Image: Nobu Toge

On 13 April at KEK's superconducting radiofrequency test facility (STF), researchers successfully transported beam to the beam dump. The dump, located in the last part of the accelerator, is designed to absorb the energy of particles within accelerated beam. Now STF is no longer a test facility: it is the STF accelerator.

STF is an important facility for ILC R&D on superconducting RF accelerating systems. Scientists have been conducting an array of R&D and tests towards beam operation of the accelerator for the Quantum Beam Project. The aim of this project is to develop a compact and high-quality X-ray source for use in broad areas such as medicine, life science, information technology, nanotechnology and quantum science.

Full-scale remodeling of the test facility into an accelerator started in 2011. Two superconducting accelerating RF cavities were loaded into a cryostat and installed in the beamline. The photocathode RF electron gun for producing low-emittance beam was placed at the upper stream of the cryostat, and the focus beamline for the compact, high-flux X-ray source was set in place at downstream.

"We worked on the improvement of our electropolishing facility in parallel with accelerator development," said Hitoshi Hayano, professor at KEK's accelerator laboratory, who leads the R&D at STF. To realise the high accelerating gradient, it was important to maintain the smoothness and cleanliness of the cavities' inner surfaces, as well as the purity of the niobium, the cavity material.

"We introduced a new rinsing method, using detergent to get rid of residue, such as niobium oxide or sulfur particles, leftover from electropolishing. We also optimised the subsequent baking process in the cleanroom so that we could prevent the melting of the indium coating on the Helicoflex seal," said Hayano. As a result of these optimisations, researchers realised the high gradients for two cavities installed in STF accelerator: 40 and 33 megavolts per metre (MV/m), well over the ILC specification of 31.5 MV/m.

On 12 April, scientists finished the final setup of the two nine-cell cavities and started beam operation with the RF electron gun and the cavities. They confirmed the successful acceleration and transportation of the beam to the beam dump the very next day.

Scientists are planning to install an optical cavity for laser beam accumulation during the short shutdown in May. This optical cavity is another critical component for producing high-intensity X-rays. They developed a four-mirror cavity system that circulates and stores the laser pulses. The beam operation with the four-mirror cavity is planned to begin running in June with a goal to demonstrate high-flux X-ray generation using inverse Compton scattering.

"This is a wonderful R&D milestone toward realising the ILC," said Akira Yamamoto, project manager of the Global Design Effort and head of KEK's linear collider office.

JAPAN | KEK | MILESTONE | QUANTUM BEAM PROJECT | SRF | STF

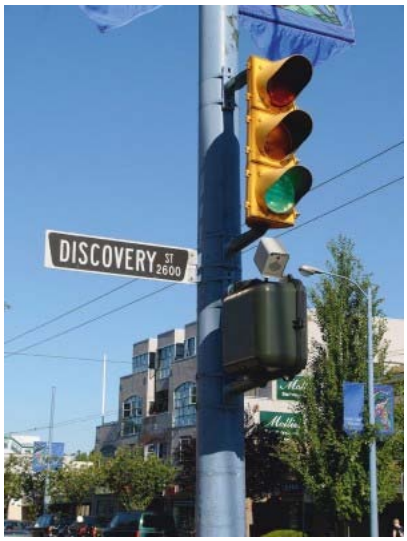
ilc newsline

DIRECTOR'S CORNER

On roadmaps and signposts

This week's issue features a Director's Corner from Brian Foster, Global Design Effort European Regional Director

Brian Foster | 26 April 2012



Signposts point the way along a narrow track that can be difficult to find. Image: Youhei Morita

When I was a young postdoc, the only roadmaps I was familiar with were useful for planning vacations. In particle physics, we didn't necessarily know where we were going but we still seemed to reach our goals with the vehicles to hand: PETRA at DESY, to discover the gluon, SppbarS (or SPS) at CERN, to discover the W and Z, LEP at CERN to put the Standard Model on firm footing, the Tevatron at Fermilab, to discover the top quark. I don't remember if we had a roadmap when we were discussing the Large Hadron Collider (LHC) and the Superconducting Supercollider, but if we did, it surely included a linear electron-positron collider to complement the LHC and investigate the finer details of the hoped-for discoveries.

One thing is however certain: roadmaps like many things in life become outdated and eventually misleading and useless. The only way to avoid this is to update them when it is clear that the landscape has, or is about to, change significantly. In 2005, CERN Council reinvented its role, laid out in the CERN Convention, of leading European developments in particle physics that could go beyond CERN the laboratory in Geneva. After a year of deliberations in 2006, including an open meeting at LAL in Orsay for the community to express its views, the steering group produced a document that set out the European priorities. These were the delivery and exploitation of the LHC, R&D into accelerators, including the Compact Linear Collider (CLIC) Study, support of the ILC as the next likely machine for energy-frontier research and a variety of other measures. By agreement with the European Union, this document was incorporated into the European Strategy Forum for Research Infrastructures' (ESFRI) own roadmap for large-scale facilities with a substantial European involvement. This opened up a variety of EU Framework 7 funding opportunities for the cornerstones of the CERN Roadmap, LHC, ILC and CLIC. For the ILC, we have received substantial R&D funding as well as support for investigations into governance for an ILC laboratory from the ILC-HiGrade project, which has just finished its funding. Other EU projects with ILC involvement enabled via the ESFRI roadmap include CRISP, which is in its early stages, and is designed to share best practice and information between a variety of so-called "preparatory phase" projects, such as the ILC.

CERN Council agreed that the European Roadmap should be reviewed and revised every five years. This review was thus put in train last year with a view to producing a new strategy early in 2013, which will then be formally adopted at a meeting in Brussels in May or June 2013. This is planned to coincide with a meeting involving European Research Ministers so that they can be exposed to the new strategy. A call for input both from individuals and interest groups has been issued by the CERN Council Strategy Secretariat, led by Tatsuya Nakada. These inputs should be available in advance of the Open Meeting to be held in Cracow from 10 to 13 September.

I, as European Director of the ILC Global Design Effort (GDE), Steinar Stapnes as Leader of the CERN Linear Collider Study and Juan Fuster as Chair of the European Committee for Future Accelerators (ECFA) Study for the Linear Collider, discussed how best

to prepare an input to this process. The first thing we decided was that it made no sense to have a specifically European response on an issue which is of its very nature completely international; the input should be carefully coordinated with our colleagues from other regions. On the other hand, there are particular European issues and perspectives that ought to be reflected in a contribution to a European strategy. This led us to decide to set up a working group that contained experts from all three regions but had a preponderance of Europeans and a European chair.

The charge for the working group is as follows:

> *The committee is requested to review the physics case for a linear electron-positron collider in the centre-of-mass energy range from around 250 GeV – 3 TeV in the light of LHC results up to mid-2012 and building on previous studies.*
>
> *The committee should consider the case for a linear collider in terms of the physics reach beyond that of the LHC under the assumptions in the current CERN planning: a) 300 fb^{-1} and b) 3000 fb^{-1}.*
>
> *It should assume linear collider performance based on the details contained in current documents from ILC and CLIC but without a detailed comparison of the relative performance of the machines. The aim is to make the strongest possible case for a generic linear collider for submission to the European Strategy process.*
>
> *The committee is requested to submit its draft report to the GDE European Regional Director, the CERN Linear Collider Studies Leader and the Chair of the ECFA Study for the Linear Collider by June 18th 2012.*
>
> *The final version of the report should be delivered by end July.*

We were delighted that Francois Le Diberder, who is also a member of the ILCSC, agreed to chair the working group. In conjunction with him, we invited experts from across the world and were also delighted that we could convince so many to devote considerable time to preparing this input. The final composition of the working group is: Francois Le Diberder (Paris-VII University, LAL, Orsay) (chair); Jim Brau (University of Oregon); Rohini Godbole (Indian Institute of Science, Bangalore); Mark Thomson (University of Cambridge); Harry Weerts (Argonne National Laboratory); Georg Weiglein (DESY); James Wells (CERN) and Hitoshi Yamamoto (Tohoku University). They will work on updating our long-standing physics case for the linear collider in the light of the exciting results already beginning to emanate from the LHC.

The group has already had several meetings and welcomes input from colleagues at any stage. In order to facilitate this input and discuss the issues, the working group has organised an open meeting which will take place in Paris on 16 May. I would like to encourage you all to give the working group your views and if possible to attend this meeting, which is taking place at a time when the physics bedrock is moving under our feet as LHC results continue to flood in. This should guarantee an interesting discussion. It should be possible for most Europeans to fly in early on the morning of the 16th and catch the last flight back, should they feel able to resist the delights of a longer stay in Paris in the springtime.

Unfortunately I myself and other members of the GDE and Physics Directorates cannot attend as the only possible date that suited the working group clashes with the ILC Program Advisory Committee meeting in Fermilab. The working group will take some time to digest the results on the meeting and the other inputs from the community before producing the first draft of the report. This will be made available for comments from the community before it is input to the CERN strategy process. We hope that, having taken input from the community worldwide, this document will be helpful as the other regions update their own roadmaps. For example, the US is planning its own exercise, which will culminate in the traditional gathering in Snowmass in summer 2013.

Roadmaps are of course useless unless one has a vehicle to get to the destination. In the linear collider community, we are clear that we need two of these vehicles. One is the LHC, which is doing a great job in clarifying the highway we need to drive down. Often, however, the greatest points of interest can only be reached by following a signpost along a narrow track that can be very difficult to find. The ILC can explore such routes and ensure that we can reach the distant horizon from where we all expect that we will be able to see physics much more clearly than today.

CLIC | EUROPEAN STRATEGY FOR PARTICLE PHYSICS | LHC | PHYSICS CASE