Around the World

Creating polarised positron beams

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Participants of the PosiPol Workshop held in Hiroshima, Japan.

The PosiPol2008 workshop was held from 16 to 18 June in Hiroshima, Japan. An unfamiliar word, "PosiPol" stands for "polarised positrons", meaning that the "spins" of positrons are aligned when they meet electrons at the centre of a linear collider. The electron beam is designed to be polarised at the ILC, but according to the baseline configuration positrons are unpolarised (or left naturally polarised) because making polarised positron is a difficult task to do.
Read more...

-- Tohru Takahashi

Calendar

Upcoming meetings, conferences, workshops

Joint CesrTA Kickoff Meeting and ILC Damping Rings R&D Workshop (ILCDR08)
Cornell University, USA
8-11 July 2008

34th International Conference on High Energy Physics (ICHEP'08)
Philadelphia, USA
29 July - 5 August 2008

Conference on the Design/ Optimization of the Silicon Detector at the International Linear Collider
University of Colorado at Boulder, Colorado, USA
17-19 September 2008

Feature Story

***From interactions.org:* Five million Euros to prepare Europe for the International Linear Collider**

ILC-HiGrade will produce a mini series of cavities.

The partners of the 'ILC-HiGrade' proposal for the European Commission's Seventh Framework Programme have just started a contract for five million Euros funding over the next four years with the European Commission. 'ILC-HiGrade' stands for 'International Linear Collider and High Gradient Superconducting RF-Cavities.' One of the main objectives of the proposal is a small serial production of accelerating cavities, superconducting components made of pure niobium for the planned International Linear Collider (ILC), that reach the high technical standards needed for the planned particle physics project. Other objectives of the ILC-HiGrade proposal are the development of a possible organisation and governance for the ILC and measures to prepare for the actual construction of the machine, including a detailed study on possible sites in Europe.
Read more...

In the News

From *Scientific American*
1 July 2008
As LHC Draws Nigh, Nobelists Outline Dreams--And Nightmares
...Gross said that such a result, going against the standard model, would itself be "enormously exciting." What worried him was finding the Higgs and nothing else, because then it would be impossible to persuade world governments to fund future machines such as the proposed International Linear Collider,
Read more...

Director's Corner

The ILC-ECFA Workshop in Warsaw

Stefan Pokorski describes various scenarios for physics at a linear collider.

From 9 to 12 June, the Faculty of Physics at the University of Warsaw, Poland, together with the Institute of Nuclear Studies hosted a workshop under the mandate of the European Committee for Future Accelerators (ECFA) to discuss the physics and detectors for a linear collider. This well attended workshop covered a broad range of topics from the physics of a linear collider to R&D for detectors. The attendants discussed the physics in advance of and preparing for the first results from the Large Hadron Collider (LHC) at CERN that will set the future course for the energy frontier.
Read more...

-- Barry Barish

Director's Corner Archive

Image of the Week

Cavities around the world

Calling all NewsLine readers with digital cameras! As you are heading off to your various holiday (and

Upcoming schools

The second Trans-European School for High Energy Physics (TES-HEP)
Buymerhovka, Sumy region, Ukraine
3-9 July 2008

Third International Accelerator School for Linear Colliders (2008 LC School)
Oak Brook, Illinois, USA
19-29 October 2008

= Collaboration-wide Meetings

GDE Meetings calendar

View complete ILC calendar

From *Courier News*
1 July 2008
Funding will prevent more Fermilab layoffs
New federal dollars save jobs, restart projects
Read more...

From *Frankfurter Allgemeine Zeitung*
30 June 2008
Der Urknall von Genf
...Denn was man im Untergrund des schweizerisch-französischen Grenzgebiets zu sehen bekommt, ist die größte Maschine, die sich Physikerhirne je ausgedacht haben – ein Teilchenbeschleuniger und Speicherring der Superlative, ausgestattet mit modernster Technik.
Read more...

From *Guardian*
30 June 2008
The Big Bang Machine / Cosmic building blocks / The particle menagerie
Today's Guardian features a special supplement on the most incredible scientific experiment ever - the Large Hadron Collider at Cern
Read more...

From *Guardian*
30 June 2008
Beyond the Standard Model
Experiments at Cern will tackle a dilemma at the heart of modern physics that defeated even Einstein, says Jim al-Khalili
Read more...

vacation) destinations, keep your eyes open for cavity lookalikes like this one, spotted in Cornwall's Eden Project. There are more out there than you think! Send them to communicators@ linearcollider.org and they may show up in NewsLine...

Announcements

ILC Note
2008-046
Mechanical tests of Titanium-Stainless Steel bimetallic transition joints

arXiv preprints
0806.4905
Two-Loop QED Heavy-Flavor Contribution to Bhabha Scattering

0806.4560
Applying the POWHEG method to top pair production and decays at the ILC

0806.2698
Leptogenesis in the minimal extension of the Zee-Babu model

Creating polarised positron beams

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However, polarised positrons are very useful if we can make them well controlled and highly polarised, strengthening the position of linear colliders as machines to explore the quantum universe.

Participants of the PosiPol Workshop held in Hiroshima, Japan.

Polarised positrons are created by hitting dense matter with polarised gamma rays. That means that making a high enough number of polarised gamma rays is one of the key techniques. The PosiPol workshop focuses (amongst other things) on so-called laser-Compton-based positron sources in which polarised gamma rays are created by flashing a strong laser at an electron beam.

While discussing many issues directly concerning polarised positron sources at linear colliders, possible application of techniques were also an important topic of the workshop. The gamma and X-rays created by the laser-Compton techniques have a wide range of applications in industrial, medical, as well as scientific sectors as reported in a past issue of ILC NewsLine. In this workshop, there was an introduction of a project to create X-rays by a combination of accelerator and sophisticated optical techniques. We also learned about the usefulness of high-flux gamma rays for nuclear waste management.

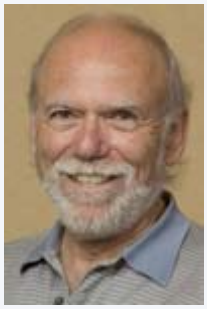
As is getting more and more popular in recent workshops, people who cannot come to the workshop gave talks remotely via an internet connection. In this workshop about a quarter of the talks were given that way. A fast and stable internet connection at the workshop site seems to be essential not only for e-mail connections but more so for the workshop organisation.

Though the rainy season had already set in in the Hiroshima area, we had unexpectedly nice weather during the workshop. The present participants enjoyed a walk around downtown Hiroshima and dinner cursing in Setonaikai inland sea in addition to fruitful scientific discussions. The next PosiPol workshop will be hosted by CERN. Participants expect to enjoy good wines in next workshop while we enjoyed many fresh fish from the Hiroshima area this year.

-- Tohru Takahashi

Director's Corner

3 July 2008


Barry Barish

The ILC-ECFA Workshop in Warsaw

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Stefan Pokorski describes various scenarios for physics at a linear collider.

Pokorsky began his talk by stating that his was a "risky subject," because he was going to try to draw up a roadmap for the future, based on available hints, but noting that the most important input, LHC results, do not yet exist. Nevertheless, he plunged into his subject energetically and first he reminded us that despite the fantastic successes of the Standard Model there are many hints that point to physics beyond it, mentioning the "naturalness of the 1 TeV Fermi scale, dark matter, and at much higher energies, neutrino masses (see-saw mechanism), grand unification, leptogenesis, etc". He then went on to argue that the Standard Model with a Higgs particle would be fine if it were the "theory of everything," but that it is theoretically problematic when embedded into a bigger theory that has a new high mass scale. Therefore, according to Pokorsky, we have reasons to expect a new low mass scale for physics beyond the Standard Model, and he pointed out that so far hierarchical mass scales in particle physics have natural explanations.

As to what we may see around the 1-TeV mass scale, Pokorski noted that there are hundreds of theoretical models, but only a few basic concepts. He went on to describe various more or less exotic ideas like supersymmetry, Higgs doublet as a pseudo-Goldstone boson, Higgsless models and gravity in suitably compacted extra dimensions, concluding that our primary task will be to build what he called the 'next Standard Model' at the 1-TeV mass scale. He played out various scenarios of which he said that supersymmetry appears the most likely. Interestingly, he stressed the connections between particle physics and cosmology, including understanding the dark matter of the Universe.


Rolf Heuer giving a personal view of the future.

The presentation by Rolf Heuer allowed a glimpse at the orientation and approach of the incoming CERN Director-General. From the title of his talk, one might have thought he would mostly review the main recommendations of the long-range strategy published last year, following a study requested by the CERN Council. Although that strategy was contained within Rolf's talk, he focused more on what he called his personal vision for the future. His vision is clearly driven by science! He described our main future tasks as getting ourselves ready to "explore the Dark Universe." Although he took a somewhat different approach from Pokorski,

for example pointing out the important roles of the LHC and a future lepton collider in uncovering this science, the two talks had very synergistic and complementary underlying themes.

A special feature of the Warsaw meeting was the first meeting of the International Detector Advisory Group (IDAG), a new committee that has been formed to help guide the detector development for the ILC. This group's mandate is to help guide the Letter of Intent (LOI) process toward technical designs of complementary detectors that is being undertaken on the same timescale as the Global Design Effort Technical Design Report in 2012. Sakue Yamada, ILC Research Director, will discuss the wok of the IDAG, which is being chaired by Michel Davier, in his future Research Director reports in *ILC NewsLine*.

Warsaw, Poland site of the ECFA Workhop.

Ever since the GDE was formed, we have made a special effort to have joint meetings of the ILC physics and detector groups and the ILC accelerator R&D and design groups. We departed from that format this time, with the physics detector meeting sponsored as an ECFA workshop in Warsaw and the GDE meeting held at Dubna to explore Russia's ILC involvement, including their possible site for the machine. These separate meetings were an exception and we plan return to having a productive joint meeting, LCWS08 and ILC08, next autumn in Chicago.

-- Barry Barish