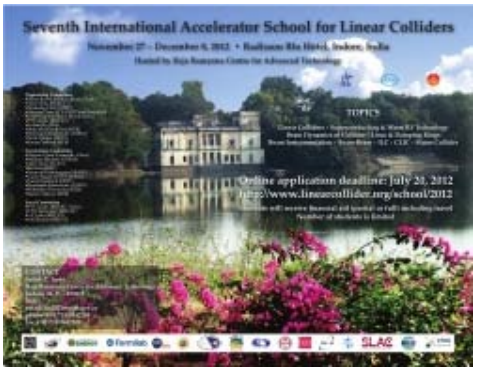
DIRECTOR'S CORNER



Linear Collider Accelerator School

by Barry Barish

A very talented group of accelerator physicists have come together from around the world to develop the technologies and design for a next-generation lepton collider that will complement CERN's Large Hadron Collider. Who better to learn accelerator physics from? The International Accelerator School for Linear Colliders to be held in Indore, India, next autumn offers this opportunity and applications are being accepted now for this year's school.

AROUND THE WORLD

Spain holds the 40th "International Meeting on Fundamental Physics" and the "Cantabria Campus Nobel"

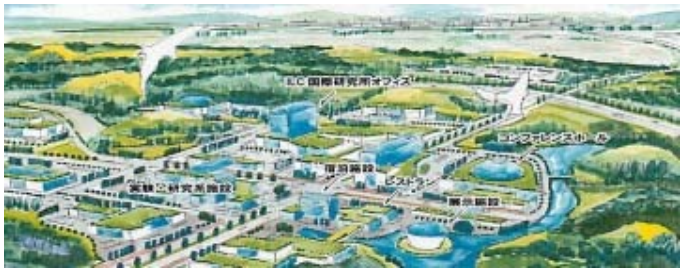
by Manuel Aguilar and Alberto Ruiz Jimeno

Spain was recently host to two international physics and science encounters: the 40th International Meeting on Fundamental Physics and the Cantabria Campus Nobel. While one was pivotal for the Spanish high-energy physics landscape, the other offered a unique opportunity for scientists from all ages and backgrounds to exchange ideas.

FEATURE

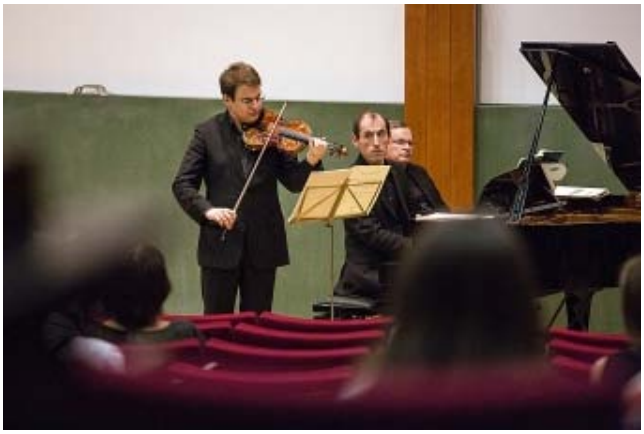
The vision to invite the ILC laid out

by Rika Takahashi



On 10 July, governors, industrial leaders, and local officials of Japan's northeastern area got together to attend a general meeting of the Tohoku Advanced Science and Technology Study Group. In the northeastern part of Japan, or Tohoku, activities towards inviting the ILC to the area has been intensified ever since the ILC was positioned as one of the promising means to recover from the disastrous earthquake occurred last year.

IMAGE OF THE WEEK



Particle Partitas premiere in Germany

Image: DESY, Thies Rätzke

Brian Foster has many hobbies, including music and running the European part of the Global Design Effort as European Regional Director. He recently staged the German premiere of the musical piece “Particle Partitas”, specially written by composer and physicist Edward Cowie and musician Jack Liebeck for an “unusual interaction of music and particle physics”, in the DESY auditorium. This is one of a series of performance lectures by Brian Foster (on microphone and violin) and Jack Liebeck on the violin. They were joined this time by pianist Danny Driver.

IN THE NEWS

from ***The Australian***
11 July
Scientists see past God particle to next big thing
At the top of the wish list is a new collider. The options are a super high-energy version of the circular Large Hadron Collider, which provided evidence that the so-called God particle exists, or a linear collider, which would explore the questions of deep physics and the earliest moments.

from ***balsas.lt***
9 July
Fizikai siūlo, kaip prigaminti Higgso dalelių
Tačiau bėda ta, kad reikiamos energijos elektronų-pozitronų greitintuvas būtų dar didesnis nei LHC. Pasiūlymas statyti tokį įrenginį, Tarptautinį linijinį greitintuvą (angl. International Linear Collider, ILC), pateiktas jau senokai, tačiau turint omenyje 20 mlrd. JAV dolerių siekiančią jo kainą, norą prisidėti išreiškė vos kelios šalys.

from ***The Herald News***
7 July
Fermilab’s Tevatron laid groundwork in search for ‘God particle’
Already the lab has been laying the groundwork for several new endeavors at the frontiers of physics — a high-intensity proton accelerator, equipment for the Dark Energy Survey that will help scientists understand the cosmic frontier, and a proposed International Linear Collider that would complement the work being done at CERN.

from ***New Scientist***
5 July 2012
Physicists propose factory to spew out Higgs particles
Particle physicists’ traditional answer to this problem has been to suggest building a machine to collide electrons and their antiparticles, positrons. Unlike protons, electrons are elementary particles, so don’t disintegrate on impact, making it clearer what is produced when they collide.

CALENDAR

UPCOMING EVENTS

SiD Workshop
SLAC
21- 23 August 2012

6th International Workshop on Semiconductor Pixel Detectors for Particles and Imaging (PIXEL2012)
Inawashiro, Japan
03- 07 September 2012

POSIPOL 2012
DESY, Zeuthen
04- 06 September 2012

View complete calendar

PREPRINTS

ARXIV PREPRINTS

1207.1246
Effect of earth rotation on pair production of Standard Model Higgs bosons at linear colliders in the noncommutative space-time

1207.0980
The top quark and Higgs boson masses and the stability of the electroweak vacuum

1207.0476
Vacuum Stability Constraints and LHC Searches for a Model with a Universal Extra Dimension

1207.0300
Evaluation of measurement accuracies of the Higgs boson branching fractions in the International Linear Collider

ANNOUNCEMENTS

Feedback wanted for European Strategy document on linear collider

Dear colleagues,

We have received a close to final report from the working group that has been set up to prepare input from the Linear Collider community to the European Strategy process. This report have been through a first level of reviews and is now made openly available to the community. We believe the report is a very good summary of the impressive physics potential of the future linear collider and based on the reviewers feedback and detailed comments so far this view seems to be widely shared.

We invite you all to provide reactions or feedback concerning the document to Francois Le Diberder by July 12th.

There are ongoing discussions of some of the received comments and the Higgs results that will need to be incorporated, so you should keep this in mind when you make your comments. Please refer to the line-numbers in the document when you make comments, and indicate what version you are referring to (the document may evolve in time), keeping in mind that the length of the document should not exceed 15 pages.

The document can be found here.

We hope you find the document as useful and concise as we have found it, and invite you to read it and provide further input as you feel needed.

Best regards,
Brian Foster, Juan Fuster and Steinar Stapnes

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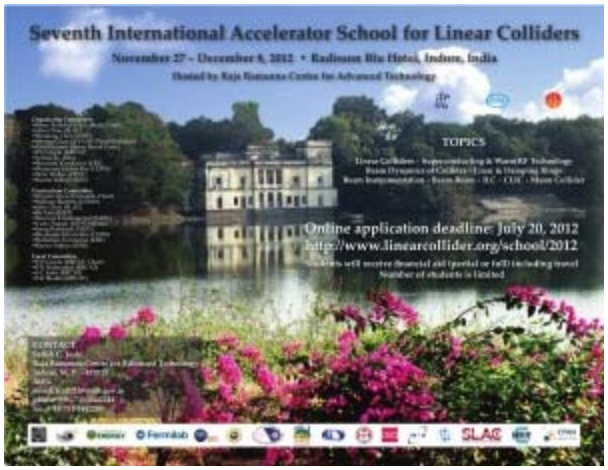
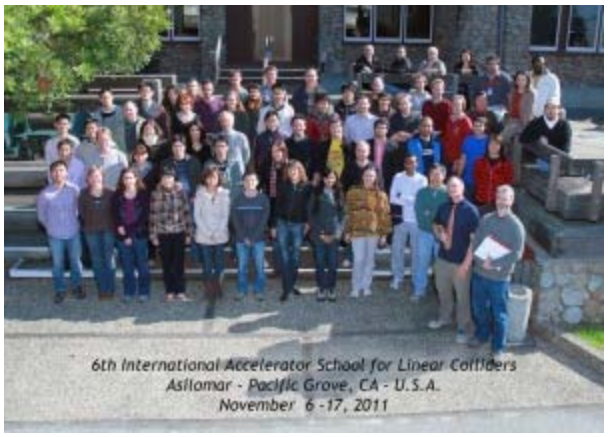
DIRECTOR'S CORNER

Linear Collider Accelerator School

Barry Barish | 12 July 2012



The poster for this year's Linear Collider Accelerator School



Group photo from last year's school in Asilomar

Today, I am pleased to announce that the Seventh International Accelerator School for Linear Colliders will be held from 27 November to 8 December 2012 at the Radisson Blu Hotel in Indore, India. These Linear Collider accelerator schools have been helping fill the need to provide training for young scientists interested in pursuing careers in accelerator physics. The schools have been very popular and have attracted a very large number of qualified applicants from around the world, including graduate students, young researchers interested in switching fields and young researchers already involved in accelerator physics but desiring the learning experience provided by the school. The students admitted to the school receive partial or full financial support, including travel to the school.

The ILC Global Design Effort is organising the school in partnership with the CLIC Study group and the ICFA Beam Dynamics Panel. Our host this year is the Raja Ramanna Centre for Advanced Technology and the venue will be the Radisson Blu Hotel in Indore, India. The school is rotated each year between Asia, Europe and the Americas, and last year's school was held in Asilomar, California, USA.

This year's school will again focus on subjects in accelerator physics that are directly related to developing a teraelectronvolt-scale lepton colliders, such as the International Linear Collider (ILC), the Compact Linear Collider (CLIC) study or a high-energy muon collider. Developing the technology and design for such a high-energy lepton collider presents many challenges in accelerator physics, in order to be capable of complementing the Large Hadron Collider. As a result, linear collider accelerator physicists are working on problems that are at the very forefront of the field. The school offers the special opportunity to learn about these topics from the leading accelerator physicists in the field and provides a unique learning experience for students interested in becoming accelerator scientists.

The curriculum this year will consist of two courses, both related to the accelerator physics of linear colliders. All students will participate in an introductory course on TeV-scale future lepton colliders (ILC, CLIC, muon collider and other advanced colliders), followed by a half-day lecture on linac basics and beam instrumentation. Then, the students will divide into two specialty tracks: Track A – accelerator physics for sources, damping rings, linacs and beam delivery system; and Track B – superconducting and warm RF technology, LLRF and high-power RF and beam instrumentation. Students interested in both tracks can apply to attend the school a second year. An interesting innovation in this year's programme is that each student will perform two hands-on experiments, choosing from experiments on SRF cavity measurements, characterisation of RF components or beam profile measurement.

Since so few universities offer a PhD in accelerator physics, accelerator schools play a very important role in providing academic training. Most accelerator physicists have come into the field following their academic studies in other fields. High-energy physics laboratories around the world have major programmes in advanced accelerator R&D to develop accelerators of the future, and these efforts provide many opportunities for scientists and engineers to become involved in accelerator physics and advanced technology projects. The ongoing work towards a next-generation lepton collider involves many of the leading accelerator scientists in the world and many challenging and forward-looking accelerator issues and technologies. Therefore, an accelerator school connected to this work makes for an excellent learning experience.

We are happy to once again be able to offer a school based on lepton collider accelerator physics this autumn in Indore, India. We encourage all those interested in an intensive and rewarding experience focused on forefront issues in accelerator physics to apply by the 20 July 2012 deadline.

ACCELERATOR RESEARCH | CLIC | ILC | INDIA | LINEAR COLLIDER ACCELERATOR SCHOOL | MUON COLLIDER

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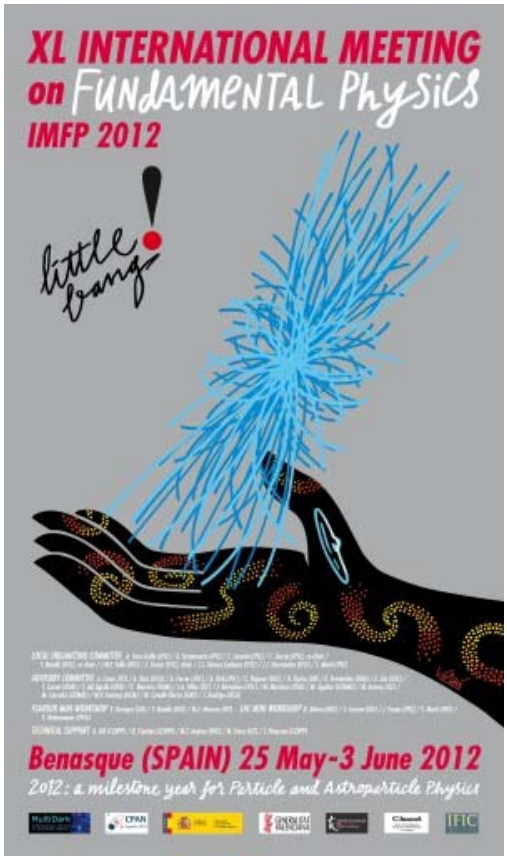
AROUND THE WORLD

Spain holds the 40th “International Meeting on Fundamental Physics” and the “Cantabria Campus Nobel”

by Manuel Aguilar and Alberto Ruiz Jimeno

12 July 2012



The meeting was announced with an unusal poster

Spain held the 40th edition of the International Meeting on Fundamental Physics (IMFP 2012) in the Spanish Pyrenees from 24 May to 3 June. 140 researchers coming from international and Spanish research institutions gathered at the Centro de Ciencias de Benasque Pedro Pascual in Benasque. The centre owes its name to Pedro Pascual, a distinguished theoretical physicist who was instrumental in the development of science in Spain, in particular fundamental research, in the last decades of the past century.

The International Meeting on Fundamental Physics (IMFP) was launched in 1973 as the result of an initiative of Manuel Aguilar (JEN-CIEMAT), Lucien Montanet (CERN), Juan Antonio Rubio (JEN-CIEMAT) and Francisco Ynduráin (Universidad Autónoma de Madrid), funded by the Institute of Nuclear Studies of Spain’s Junta de Energía Nuclear (JEN), with strong support from CERN. One of the main initial goals of IMFP war setting up a forum in which prestigious researchers, mostly coming from abroad, would present the most relevant scientific advances in experimental high-energy physics to the young and very reduced community of Spanish physicists working in the discipline.

Spain had withdrawn from CERN in 1969, and IMFP was founded to bring it back into the heart of the European research community. It was also supposed to foster collaboration between particle physicists and explore possible mechanisms for the development and consolidation of particle physics in Spain, for example through the participation in research programmes at other large international laboratories. At one of the earliest IMFP meetings, discussions took place to identify the most effective ways to facilitate the return of Spain to CERN, which finally happened in 1983. Forty years later the community recognises that IMFP has largely fulfilled its initial goals, becoming a reference at the national level and an international event that is widely appreciated.

The latest edition at the Centro Pedro Pascual, in the beautiful site of Benasque, included a workshop on flavour physics and on the relevance and opportunity of super B factories, in the construction phase or under discussion, sessions on neutrino physics, physics at the Canfranc Underground Laboratory, cosmic rays and ultra-high-energy gamma rays, dark matter and dark energy, gravitational waves, physics at the hadron colliders Tevatron at Fermilab and LHC at CERN. The future of the LHC and its ambitious experimental programme and the scientific perspectives of the electron−positron colliders under consideration (ILC and CLIC) were the subject of long scientific sessions of remarkable interest. The last part of the meeting was devoted to present the plans to design a European Strategy for Particle Physics and to make an assessment of the situation in Spain and the possible contributions from our community. Participants concluded that the situation in Spain is excellent from the scientific point of view

and fairly worrisome in what concerns the evolution of resources.

Grou picture in front of the Centro de Ciencias de Benasque Pedro Pascual in Benasque.

This meeting was organised by IFIC (Institute of Corpuscular Physics, a Joint Center CSIC−University of Valencia), under the leadership of Francisco Botella, Juan Fuster and Carmen García, and was funded by CPAN, the National Program for Particle Physics, IFIC, CIEMAT, the Consolider project Multidark and the Centro Pedro Pascual.

Then, from 11 to 15 June, the University of Cantabria (UC) and the International University Menéndez y Pelayo, extended an invitation to international experts to participate in the unique international encounter called Cantabria Campus Nobel. The Cantabria Campus Nobel aimed at pushing the boundaries of knowledge on the basis of collective thinking, rigorous analysis and the exchange of innovative experiences.

Intergenerational dialogue was designed to be the essence of the venue, with three Nobel Laureates, 50 senior world-class scientists and 100 bright young researchers, selected from all possible areas of knowledge. Debates, one-to-one interactions and close conversations were coupled with master classes and lectures, workshops and round table sessions.

The afternoon and evening of 11 June was dedicated to high-energy physics with a Round table on High Energy Physics called “The LHC and future linear colliders analysis (Higgs mechanism and new physics searches)”. It was hosted and coordinated by Alberto Ruiz Jimeno from the University of Cantabria. He is also EB member of the ILD concept for ILC and gave a speech about High Energy Physics concepts and goals. The Participants in the round-table were Sven Heinemeyer of the Cantabria Institute of Physics (IFCA), Francisco Matorras Weinig of the University of Cantabria, and François Richard, who spoke about the worldwide strategy for future linear colliders, its goals and challenges.

SPAIN

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FEATURE

The vision to invite the ILC laid out

Rika Takahashi | 12 July 2012

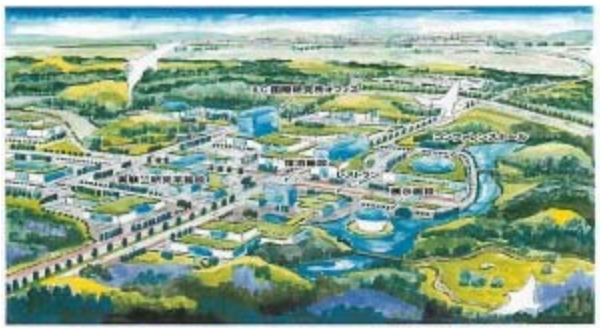

Image of the main campus of ILC science city image: Nomura Research Institute / Fuuyama Consultant

On 10 July, governors, industrial leaders, and local officials of Japan's northeastern area got together to attend a general meeting of the Tohoku Advanced Science and Technology Study Group. In the northeastern part of Japan, or Tohoku, activities towards inviting the ILC to the area has been intensified ever since the ILC was positioned as one of the promising means to recover from the disastrous earthquake occurred last year.

One of the highlights of the meeting was the presentation of a report entitled "The future vision of Tohoku with the International Linear Collider as a core facility." This report was written up by a working group composed of specialists from a wide range of communities: scientists, local officials, industrial members, and journalists from local medias with the help of a consulting firm.

After the meeting, Michio Kitamura, senior consultant at the Nomura Research Institute (NRI) gave a presentation to explain the contents of the report. Kitamura estimated the expected direct economic ripple effect would be 4.3 trillion yen, or 0.54 trillion US dollars for the 30-year-period of construction and operation of the accelerator facility. Based on their calculation, the ILC project would create 250 thousand jobs in the area. "The number has decreased from the estimate we made before," said Kitamura. NRI had made an estimate on the ILC's economic effect last November, based on the whole construction cost of 0.87 trillion yen, stated in the ILC's *Reference Design Report* issued in 2007. "This time we made detailed estimate with the 0.48 trillion yen, the likely cost that Japan would bear." Kitamura said that the ILC's economic effect through technology innovation will "go far beyond the amount of direct ripple effect. I wanted to present the number in this report, but to calculate a reliable number, we will need more time."

The report also presented the design of the new science city. The report estimated the size of the main campus as 100 hectares, where the major buildings such as laboratories, experimental facilities or a conference centre will be built. It estimated that 3000 housings will be needed for ILC-related newcomers. "We assume that foreign researchers and their families will be the main occupants of those housings. We estimate the population of the city up to 14 thousand when the ILC is under regular operation."

The report that is over 30 pages long mentions the wide variety of the city functions that will enable the foreign researchers and their families to live in Tohoku as a present experience, such as legal and accounting services, medical facilities, or shopping malls and leisure venues.

Takuya Tasso, the governor of the Iwate prefecture, said that "writing up a report of this sort by the effort of Tohoku local community at this moment is pretty significant, since the Japanese government has not positioned the ILC as a national project yet. I will utilise this report for the dialogue with the government officials." Yoshihiro Murai, the governor of the Miyagi prefecture that was most severely affected by last year's earthquake, said, "the ILC is necessary for Tohoku. I will do my best to support the activities to invite the ILC here."

"From today, this study group will grow into a more solid organisation to work towards the realisation of the ILC in Tohoku," said Susumu Satomi, the president of Tohoku University and the chair of the study group. The study group was established four years

ago, and the activities of the group were focused on the investigation on the possible construction site and development of an environment conducive to activities towards ILC promotion. The Global Design Effort will issue the *Technical Design Report* at the end of this year. And the wonderful news of the discovery of the Higgs-like particle has just come from CERN. “The ILC is a project which could shape the future of human beings and revolutionise our knowledge of our universe. I truly hope to build it here.” Satomi continues to represent the new organisation that will lead the activity to invite the ILC to Tohoku.

ECONOMIC IMPACT | ILC SITE | JAPAN | TOHOKU