ILC NEWSLINE
THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

FEATURE

Spain and Japan strengthen industrial collaboration toward the ILC

by Tohru Takahashi (Hiroshima University)

A Spanish Japanese Collaboration in industry and science? Yes, a collaboration which just took another important step to strengthen this relationship at May 13th at the Collaboration Opportunities on Fusion and Accelerator Technologies and Projects workshop at the Spanish Embassy in Tokyo. Tohru Takahshi from Hiroshima University attended this workshop and offers his impressions about the actual developments and relations between Japan and Spain. In his short review of this event he included many details about the speakers, the Spanish Japanese History and of course a short look in further events.

DIRECTOR'S CORNER

Coming up: the ECFA Linear Collider Workshop

by Mike Harrison

The ILC's central region – the bits of accelerator and other technology around the point where particles will collide – will get special attention at the upcoming ECFA Linear Collider Workshop in Santander, Spain. But changes to the design, civil engineering issues and detector topics also feature on the agenda. ILC Director Mike Harrison looks forward to seeing his colleagues face to face, rather than by video.

IMAGE OF THE WEEK

German particle physics community gives "strongest support" to ILC

by Barbara Warmbein

It may feel like only yesterday that the update of the European Strategy for Particle Physics was adopted, but preparations for a new one, planned for 2018/19, are already underway. Germany has now published its first conclusions from a workshop on future electron-positron colliders that are very supportive of the ILC.

IN THE NEWS

from ***Scientific American***
1 June 2016
The Collider That Could Save Physics
A proposed Japanese accelerator could solve those mysteries the LHC did not

from ***Kahoku Shinpo***
20 May 2016
＜Ｇ７仙台＞東経連「東北の企業力見て」
東経連ビジネスセンターは１９日、仙台市青葉区の仙台国際センターであったＧ７財務相・中央銀行総裁会議の歓迎レセプション会場に特設ブースを設け地元企業の優れた技術や製品をＰＲした。ＩＬＣの誘致を目指す―東北ＩＬＣ推進協議会も模型を展示。ＰＲ動画を上映し、誘致に積極的な姿勢をアピールした。(Tokeiren Business Center has set up a PR booth introducing goods and technlogies by local industries at the welcome reception of G7 Finance Ministers, Central Bank Governors meeting held in Sendai city, Japan. Tohoku ILC promotion council exhibit the ILC model and promotion video, emphasizing the strong commitment toward the ILC realization.)

from ***Iwate Nippo***
17 May 2016
ILC早期実現へ要望　奥州市議会議連が国会議連に
ＩＬＣ計画の実現を目指す奥州市議会国際リニアコライダー誘致推進議員連盟は１６日、超党派のリニアコライダー国際研究所建設推進議員連盟（会長・河村建夫衆院議員）に、計画の早期実現を要望した。（Federation of Oshu city council memebers for atracting the ILC visited Federation of Diet Members for the ILC on 19 May, asking for the early realization of the ILC.)

from ***The University of British Columbia***
16 May 2016
New TRIUMF branch office bolsters Canada-Japan partnership in physics research
TRIUMF and KEK have numerous shared projects in the areas of subatomic physics, accelerator science, and materials science. Current efforts include the T2K and Belle II experiments in Japan, the Large Hadron Collider at CERN, and the proposed International Linear Collider The hope of this new office and indeed the new partnership agreement is to advance scientific discovery through enhanced bilateral collaboration.

from ***Iwate Nippo***
14 May 2016
ILC実現へ日・スペイン連携確認　東京で県立大学長ら
スペインと日本の核融合や加速器分野の協力強化に向けたワークショップが１３日、東京・六本木のスペイン大使館で初開催され、ＩＬＣ計画の実現に向け、両国の科学者や企業関係者らが連携を確認した。(A workshop to strengthen the relationship between Spanish and Japanese industries in the field of fusion and accelerator science was held on 13 May at the Embassy of Spain in Tokyo. Participants affirmed the collaboration toward the realization of the ILC.)

from ***Canarias7***
13 May 2016
España busca participar en el futuro acelerador lineal de partículas de Japón
Científicos y empresarios españoles se reunieron este viernes en Tokio con investigadores nipones para discutir su posible participación en el futuro Colisionador Lineal Internacional (ILC), un proyecto de gran magnitud que Japón aspira a albergar.

from ***Iwate Nichi Nichi***
13 May 2016
誘致で東北創生を　東経連ＩＬＣシンポ　仙台
先進７カ国（Ｇ７）仙台財務相・中央銀行総裁会議開催記念シンポジウム「国際リニアコライダー（ＩＬＣ）と東北の創造的復興」（東北経済連合会主催）は12日、仙台市内のホテルで開かれた。(On 12 May, Tohoku Economic Federation hosted a symposium regarding ILC and reconstruction of Tohoku area as a pre-event for the G7 Finance Ministers, Central Bank Governors meeting at a hotel in Sendai.)

CALENDAR

Upcoming events

ECFA Linear Collider Workshop
Santander, Spain
30 May- 05 June 2016

Upcoming schools

The 2016 European School of High-Energy Physics
Skeikampen, Norway
15- 28 June 2016

Linear Collider Physics School
Frauenchiemsee, Germany
20- 27 July 2016

View complete calendar

PREPRINTS

ARXIV PREPRINTS

1605.06388
Non-linear Higgs portal to Dark Matter

1605.05075
The semi-digital hadronic calorimeter (SDHCAL) for future leptonic colliders

1605.04692
Les Houches 2015: Physics at TeV Colliders Standard Model Working Group Report

1605.02867
Numerical Studies on Time Resolution of Micro-Pattern Gaseous Detectors

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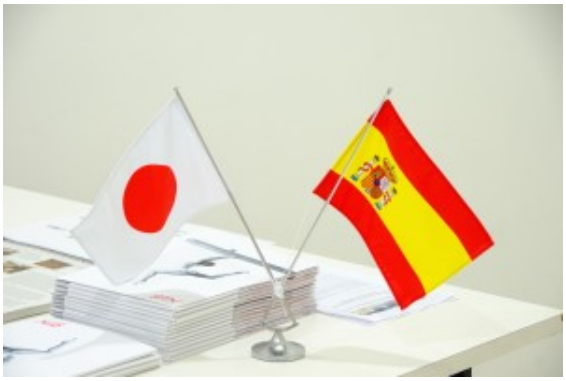
FEATURE

Spain and Japan strengthen industrial collaboration toward the ILC

Tohru Takahashi (Hiroshima University) | 26 May 2016



The workshop was the first industrial collaborative workshop in science field held at the Embassy of Spain in Tokyo. Image: Nobuko Kobayashi

Spain and Japan have taken an important step to strengthen their cooperation. On 13 May, a workshop called “Collaboration Opportunities on Fusion and Accelerator Technologies and Projects between Spanish and Japanese Organizations” was held at the Embassy of Spain in Tokyo. This workshop was jointly hosted by the Spanish Institute for Foreign Trade (ICEX), the Spanish Association for the Industry of Science (INEUSTAR), Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (CIEMAT), Japanese National Institutes for Quantum and Radiological Science and Technology (QST), and Japan’s Advanced Accelerator Association promoting Science and Technology (AAA). The Embassy of Spain is located in Roppongi, in the middle of Tokyo down town. The building was pretty and chic, and was an unfamiliar surroundings for me, so I felt uplifted just being there.

The aim of this workshop was to strengthen the mutual understanding and cooperation between industrial players involved in nuclear fusion and accelerator science. Another workshop for the same purpose is planned as an associated event for the European Linear Collider workshop 2016 to be held in Santander, on 1 June. Executives from seven Spanish companies took the opportunity of their trip to Asia to attend the International Particle Accelerator Conference (IPAC) held in Busan, Korea, to have face-to-face networking opportunity with Japanese companies. The meeting room was almost full with roughly 20 participants from Spain and 70 from Japan.

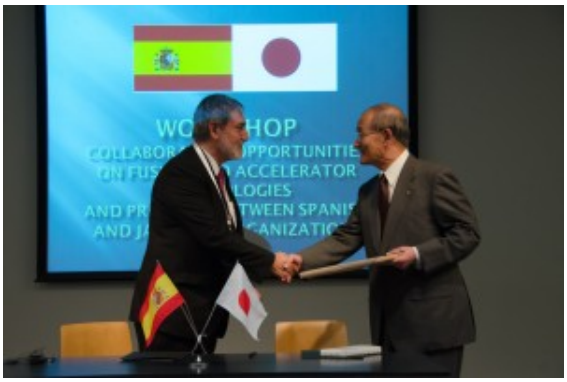
The workshop was opened by His Excellency Mr. Gonzalo de Benito. “Although Spain and Japan are geographically far away, and there are many differences between the two countries, we have had a close relationship for a long time,” said H.E. Benito. In 1613, the Sendai feudal lord Masamune Date dispatched the Keicho Mission to the Vatican and Spain to negotiate direct trade with Spain, and it was the first time that Japan sent a diplomatic mission to Europe. In 1868, the two countries signed a Treaty of Amity and Commerce, and diplomatic relations were established. “Taking this workshop as an opportunity, I hope that two countries will also strengthen their relationship in the field of science and technology,” he said.

Following the opening address, Mr. Masanori Matsuoka, Secretary General of AAA, gave a talk about its efforts and Japanese industry’s activities in accelerator science field. AAA,Japan’s industry and academia collaboration, was established in 2008, serving as a forum for issues on R&D, intellectual property rights and other related areas concerning the ILC as a model project. AAA has also been actively conducting public outreach for the ILC. “Now, 146 companies, universities, and laboratories are part of the AAA. This is an obvious proof of big expectations for the ILC project,” he said.

As a AAA’s counterpart, Mr. Javier Caceres, General manager of INEUSTAR, the Spanish Science Industry Association, introduced the activities of Spanish Science Industry Sector. “We are very interested in participating in the ILC project, and will support the construction when it is carried out in Japan. It is a win-win relationship and would be extremely beneficial to Spanish industry,” he said. In the

workshop, participants also discussed how to achieve technology transfer between science and industry more effectively.

Dr. Mario Peres of CIEMAT, a Spanish public research body which focuses on energy and environment, and their related technologies, reported about fusion and particle physics projects in Spain. Spanish industry is making a strong contribution to the projects such as IFMIF (The International Fusion Materials Irradiation Facility), or European DONES, which Spain is a candidate to host and Japanese collaboration is supporting Spain's bidding. "I hope to continue the collaboration between our two countries," he said. From Japanese academic sector, Dr. Atsuto Suzuki, President of Iwate Prefectural University and former Director General of KEK, and Dr. Satoru Yamashita, Professor at the University of Tokyo gave talks about the status of the ILC. Suzuki talked from the perspective of Academia-Industry collaboration, and Yamashita from a scientific point of view. Also, Dr. Shinichi Ishida, Deputy Director General of Naka Fusion Institute, National Institute for Quantum and Radiological science and technology explained fusion projects.



Letter of Intent signing ceremony: Javier Caceres of INUESTAR (left) and AAA's Takashi Nishioka (right)

ITER and ILC are typical examples of big science project, but I think it is very rare to have speakers from both project have talks at the academic-industrial collaboration workshop.

At the end of the workshop, a signing ceremony of a Letter of Intent between INUESTER and AAA by Mr. Takashi Nishioka, Chairman of AAA and Mr. Caceres was held. This LOI is aiming to continue exploring joint collaboration opportunities in the area of fusion and accelerator research.

This workshop was very successful and made a good starting point to enlarge international academia-industry collaboration to other countries, which is vital for the realisation of the ILC.

The latter half of the workshop was series of interesting presentations from Spanish companies, and many valuable opportunities for information exchange, and so will happen at next Spain-Japan Industrial Session to be held on 1 June, in Santander to catch up. Please join! You will find the detail of the session here.

AAA | COOPERATION | ECFA LC2016 | ILC | INDUSTRY | ITER | JAPAN | SPAIN

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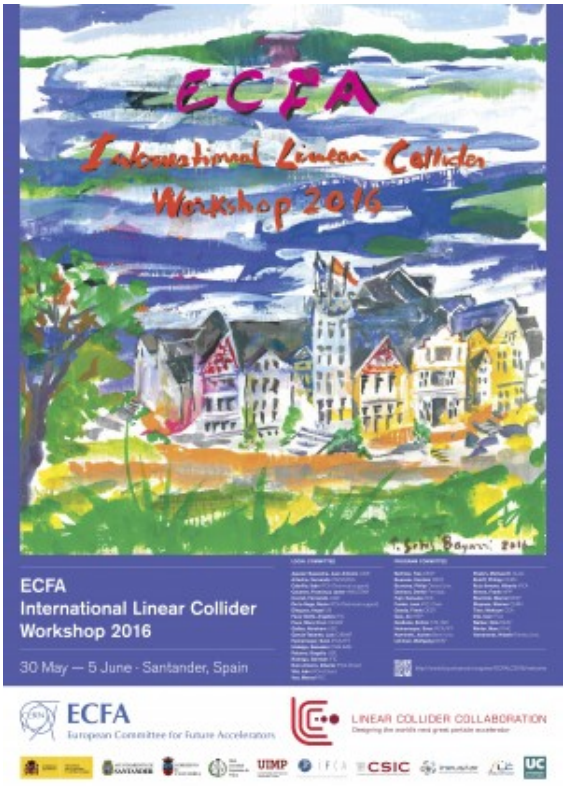
Coming up: the ECFA Linear Collider Workshop

Mike Harrison | 26 May 2016



Face-to-face interaction will drive progress in the upcoming ECFA linear collider workshop, Mike Harrison hopes.

In a global collaboration most of the personal interactions take place electronically, so our bi-annual linear collider workshops take on extra significance as one of the few opportunities to provide high-bandwidth (face-to-face) communication. For the accelerator community the upcoming Santander Workshop will enable progress in the ILC design to be both examined and where appropriate ratified. The four-day meeting has been structured to minimise the number of parallel accelerator sessions, thus hopefully allowing for multi-disciplinary connections between the various working groups.

Since the last workshop in Canada, a significant effort has taken place to try and understand the central region layout in more detail. For these purposes the central region is defined to be that section of the machine between both linacs. Unlike the repetitive main linac sections, the central region covers a large number of one-off systems. These each require separate design solutions which then need to be integrated into an optimised solution. These areas include the damping rings, beam delivery systems, beam dumps and collimators, transfer lines, positron and electron sources, and not least the experiments themselves. The tunnel cross-section is non-uniform and changes significantly with position along the length. A working group has been thinking about these issues for the past several months. The working group will not have any final designs yet but concepts will be presented and discussed.

In addition to the central region the conventional facilities working group will be addressing some topological questions. Can the access areas be made identical to each other or does the site geography require customised designs? Hopefully the solutions, if not identical, can be based on a common approach. Similar questions can also be asked of the surface cryogenic plants. Each surface facility of the LHC ended up as a unique entity. Hopefully the ILC will be consistent with more modular solutions. The cryogenics working group will be concentrating on the optimal positioning of the 4.2K cold box (in the tunnel or on the surface?), the impact of an operating temperature of 1.8K, and will also start to tackle the subject of failure modes.

Design change requests associated with the positron target region, the cryogenic plant, and the main linac cross-section have been submitted and reviewed by ad-hoc panels. The recommendations of these panels will be presented to the Change Management Board during the workshop. Hopefully decisions on the fate of these proposals will be made.

The Beam Delivery System (BDS)/Machine Detector Interface (MDI) sessions will be looking at the issues associated with collimation and beam halo. With such high-powered beams as those expected in the ILC, beam halo manifests itself not just as experimental backgrounds but also potentially as equipment damage. Muons with their highly penetrating characteristics are especially demanding in their need for special shielding and spoilers.

The production of sufficient positrons to meet the luminosity goals has long been recognised as one of the main technical challenges of the ILC complex. The sources working group will be concentrating on various aspects of the positron target system in an active programme. This will cover target designs associated with both electron-driven and undulator-based sources as well as problem inherently in the target region itself. So much power is needed on the positron production target that the target elements become significantly radioactive, which raises questions of shielding, equipment handling, failure modes, and maintenance requirements.

In addition to the accelerator design activities the workshop will host some superconducting radio frequency (SCRF) sessions examining the latest results in cavity technology, the global technical status, as well as powering systems. System tests at the ATF2 facility at KEK, Japan will be looking at intensity related effects and sub-system status as well as beam size improvements.

The Santander workshop promises to be a highly productive enterprise following in the footsteps of the Whistler meeting and the many other linear collider gatherings preceding these. Progress at the moment may be slower than we would like. But progress is progress.

ACCELERATOR R&D | CENTRAL REGION | CHANGE CONTROL BOARD | CIVIL ENGINEERING | ECFA | ILC | MACHINE DETECTOR INTERFACE | SPAIN | WORKSHOP

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IMAGE OF THE WEEK

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The German community of particle physicists is represented by KET, the Committee for elementary particle physics (or Komitee für Elementarteilchenphysik if you need to know). At a KET workshop held in Munich in early May, participants took stock of and discussed options for electron-positron colliders that are currently on the table in order to form a strategy of the German high energy physics community based on consensus. Here are their conclusions:

> *1. The physics case for a future e+e- collider, covering energies from Mz up to the TeV regime, is regarded to be very strong, justifying (and in fact requiring) the timely construction and operation of such a machine.*
>
> *2. The ILC meets all the requirements discussed at this workshop. It is currently the only project in a mature technical state. Therefore this project, as proposed by the international community and discussed to be hosted in Japan, should be realised with urgency. As the result of this workshop, this project receives our strongest support.*
>
> *3. FCC-ee, as a possible first stage of FCC-hh, and CEPC could well cover the low-energy part of the e+e- physics case, and would thus be complementary to the ILC.*
>
> *4. CLIC has the potential to reach significantly higher energies than the ILC. CLIC R&D should be continued until a decision on future CERN projects, based on further LHC results and in the context of the 2019/2020 European Strategy, will be made.*

Read the conclusions including footnotes on the KET website .

CERN | CLIC | EUROPEAN STRATEGY FOR PARTICLE PHYSICS | FCC | GERMANY | ILC | KET