NEWSLINE
THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

FEATURE

Discussions at the political level over the ILC in US and Europe

by Rika Takahashi

Right after the Asian Linear Collider Workshop (ALCW) 2015 and ILC Tokyo Event, another big milestone for the ILC happened in the United States. From 26 to 30 April, three members of the Diet and members of Japan's Federation of Diet Members for Promotion of the ILC, Takeo Kawamura, Ryu Shionoya and Shun-ichi Suzuki visited Washington D.C., to meet with their American counterparts to discuss the ILC.

DIRECTOR'S CORNER

Japanese diet members go to Washington

by Harry Weerts

Japanese and US officials as well as representatives from the physics community met in Washington, D.C. to discuss how Japan and the US can work together toward the realisation of the ILC. Americas Regional Director Harry Weerts reports.

AROUND THE WORLD

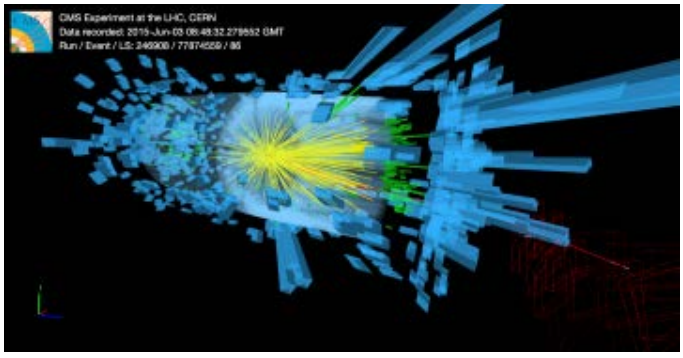
The European XFEL – helping pave the way for the ILC

by Ricarda Laasch

The European XFEL at DESY, Germany, will be a brilliant light source for a broad range of fundamental research in all areas of science – but it is also the first great mass production of the so-called TESLA technology. The ILC community is thus watching the construction of the European XFEL very closely.

IMAGE OF THE WEEK

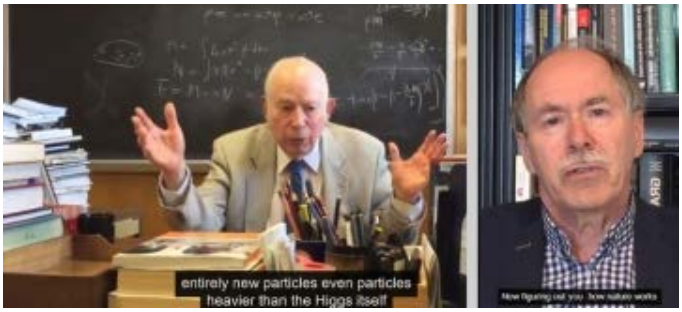
LHC is back in business



On 3 June, the Large Hadron Collider (LHC) at CERN started delivering physics data for the first time in 27 months at the record energy of 13 TeV. This marks the start of season 2 at the LHC, opening the way to new discoveries. The LHC will now run round the clock for the next three years."Run 2 of the LHC can well decide the future of the field. I'm super excited!" said LCC deputy director and theorist Hitoshi Murayama on the day.

VIDEO OF THE WEEK

Steven Weinberg and Gerard 't Hooft join #mylinearcollider



Gerard 't Hooft and Steven Weinberg speak in favour of the expected precision results a linear collider would bring, joining the #mylinearcollider video campaign from their offices in the Netherlands and at the University of Texas. They point out the benefits the project would bring not only to the host, but to the world of science and humanity in general, and Weinberg advocates Japan as the host site for the project.

IN THE NEWS

from *Business Insider*
10 June 2015
The LHC is the largest machine ever built by humans — here's the plan for an even bigger one
Now the ILC just needs to secure a chunk of funding and a construction site. Japan may be stepping up to the plate.

from *AAA*
2 June 2015
ILC科学少年団 ケーブルテレビで放送開始
先端加速器科学技術推進協議会も提供するケーブルテレビ番組「ILC科学少年団」の放送が、　月　日　月　から始まりました。YouTubeからもご覧頂けます。(The cable TV program "ILC science club" is on air from 1 June. The program is available on Youtube, too https://www.youtube.com/watch?v=GYMlu4j8yQs&feature=youtu.be)

from *Iwate Nippo*
28 may 2015
ILC東北推進協　働き掛けを　　自民と文科省に要望書
東北　　推進協議会は　　日、国際リニアコライダー　　の国内誘致に向けた働き掛けを自民党と文部科学省に要望した。(ILC Tohoku promotion council made an appeal to invite the ILC to Japan to Liberal Democratic Party and MEXT.)

from *Cold Facts*
Vol. 31 No. 2
YouTube Campaign Supports #mylinearcollider
The Magazine of the Cryogenic Soyiety of America, Inc.

from *Science 2.0*
14 May 2015
Burton Richter Advocates Electron-Positron Colliders, For A Change
Burton Richter, 1975 Nobel prize in Physics for the discovery of the J/ψ meson, speaks about the need of a new linear collider for the measurement of Higgs boson branching fractions in a video on Facebook.

CALENDAR

Upcoming events

Meeting of the American Physical Society Division of Particles and Fields (DPF 2015)
Ann Arbor, Michigan, USA
04- 08 August 2015

XXVII International Symposium on Lepton Photon 2015 (LP 2015)
Ljubljana Exhibition and Convention Centre, Slovania
17- 22 August 2015

View complete calendar

PREPRINTS

ARXIV PREPRINTS

1506.03255
Electron spectra and coherence of radiation in undulators

1506.01963
Testing general relativity on accelerators

1506.01783
Efficient collisional blockade loading of single atom into a tight microtrap

1506.01708
α-Attractors: Planck, LHC and Dark Energy

1506.00918
The FCC-ee study: Progress and challenges

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FEATURE

Discussions at the political level over the ILC in US and Europe

Rika Takahashi | 11 June 2015

Right after the Asian Linear Collider Workshop (ALCW) 2015 and ILC Tokyo Event, another big milestone for the ILC happened in the United States. From 26 to 30 April, three members of the Diet and members of Japan's Federation of Diet Members for Promotion of the ILC, Takeo Kawamura, Ryu Shionoya and Shun-ichi Suzuki visited Washington D.C., to meet with their American counterparts to discuss the ILC.

Round table discussion at Hudson Institute. Mr. Kawamura from Japan's Federation of Diet members giving a talk

On 26 May, the general meeting of the Federation was held in Tokyo, and the result of the Washington visit was reported. "I was really impressed by the positive atmosphere surrounding the ILC in the US," said Kawamura, Chair of the Federation, in the general meeting. This is the third consecutive year for them to visit Washington for this purpose. He analysed that this change of mood in the US has been influenced by the positive statement included in the P5 report issued May last year. "I am keenly aware of the expectation the other regions have towards Japan, and we should keep advancing our effort," said Shionoya, Secretary-General of the Federation.

Diet members were accompanied by Japanese scientists and members of the Advanced Accelerator Association promoting science and technology (AAA), Japan's industry-academia-government collaboration based on advanced accelerator technology. The delegation held a roundtable discussion at Hudson Institute, a US-based independent research organisation which helps manage strategic transitions to the future through interdisciplinary studies in various fields.

Participants included US Congress members and Japanese Diet members. US representative Randy Hultgren gave an speech at the round table. From the US side, Jim Siegrist, Associate Director of Office of High Energy Physics in the US Department of Energy (DOE), Kenneth R. Weinstein (CEO) and William Schneider, Jr. (former undersecretary from the US Department of State) from the Hudson Institute, and officials from Congress participated in the discussion. Other participants were Lyn Evans, Director, Hitoshi Murayama, Deputy Director, Harry Weerts, the Americas Regional Director from the Linear Collider Collaboration and Andy Lankford, the Chair of US High Energy Physics Advisory Panel, as well as from Japan Atsuto Suzuki, former Director General of KEK, Jun-ichi Nishiyama, Advisor of AAA, and Satoru Yamashita from the University of Tokyo. About 10 further respersentatives from research institutes and industries participated in the discussion.

At the meeting, participants concurred on the imminent need for the discussions at the government and legislature levels in order to further strengthen the US-Japan relation in science and technology. As a result, the roundtable participates agreed to aim for the creation of a US-Japan caucus for science and technology to enhance the US-Japan cooperation, with a focus on large-scale

international projects based on advanced technologies, critical technologies with large impact on our economical and social life, frontier science research as well as national security. Specific topics of discussion will include: nuclear and fusion energy, space exploitation such as the International Space Station (ISS), next-generation high-speed computing, and advanced accelerators, such as the Large Hadron Collider (LHC) at CERN, and the International Linear Collider (ILC). They are aiming to form this alliance in early autumn of this year.

Shun-ichi Suzuki, Deputy Chair of the Federation, said, “Future activities in the domain of advanced science won’t be possible to be pursued as a national project of a single country, both technically and financially. Those projects should be driven forward by international collaboration. The to-be-established caucus will be a good foothold for the realisation of the project.”

They also met individually with representatives from US authorities: Rush Holt, former Congressman and CEO of the American Association for the Advancement of Science (AAAS), William Colglazier, former Science and Technology Adviser to the U.S. Secretary of State, Congresspeople Billy Long and Eddie Barnice Johnson, and John Rivard, Legislative Fellow at Office of Lamar Alexander, explaining the status of the ILC project and discussing the importance of strengthening the US-Japan cooperation in science and technology.

Their visit coincided with the one of Japanese Prime Minister Shinzo Abe, who gave a speech to the joint session of the Congress on 29 April. Diet members Shionoya and Suzuki were invited to the dinner hosted by the prime minister, where they discussed the ILC with US officials including Dr. Ernest Moniz, Secretary of Energy, Dr. John P. Holdren, Assistant to the President for Science and Technology, US Ambassador to Japan, Caroline Bouvier Kennedy, and Diana DeGette, co-chair of the Congressional Study Group on Japan.

Kawamura said, “the interest of the US in the ILC is growing. We would like to make more effort to realize the project, and wish to provide clear answers in a timely manner.”

Another delegation of Japanese politicians consisting of six members of the Japan-EU Parliamentary Friendship Association headed to Strasbourg, France at almost the same time, for the 35th Japan-EC Parliamentary Conference.

The European Parliament has subsidiary groups called Delegations, which maintain relations and exchange information with parliaments in non-EU countries. The European Parliament Delegation for relations with Japan is one of the longest established in the Parliament, created in 1979. Since that date has held annual conference with counterparts from the Japanese Diet.

Kenji Kosaka, Chairman of the Friendship Association said “This was the good opportunity to reach out to the European Parliament”. In the first session of the Conference chaired by Kosaka, the ILC was included as a topic of discussion. Takeshi Shina, who is also a member of Federation of Diet member for ILC, presented an introduction of the ILC. “Total of about 40 Parliament members joined the session, and I strongly felt introduction of ILC made the Europe’s increased awareness to the project. European countries’ participation in the project is indispensable for the realisation of the ILC. I think we have accomplished certain results by this visit.” Kosaka summarised.

Kosaka with other Diet members also paid a courtesy call to Cecilia Malmström, European Commissioner for Trade, to discuss about Economic Partnership Agreement, and handed ILC-related documents to her.

In Japan, government-level discussions are ongoing at the expert panel established under Ministry of Education, Culture, Sports, Science and Technology (MEXT) . They are planning to issue an interim report on the result of their discussions and findings and discussion this summer. “Based on the report, we will discuss what Japan will do. The federation will encourage closer cooperation with US Europe and Asia, toward the realisation of the ILC,” said Shionoya.

AAA | DOE | HUDSON INSTITUTE | JAPAN | MEXT | US

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DIRECTOR'S CORNER

Japanese diet members go to Washington

Harry Weerts | 11 June 2015

US and Japanese officials and members of the physics community met in Washington, D.C.

There was a visit by Japanese Diet members to Washington DC from 26 to 29 April (see *"Discussions at the political level over the ILC in US and Europe"* in this issue of *LC NewsLine* *link to Rika's story*). I attended two of those meetings, one on 28 April at the Hudson Institute and one on 29 April at the Japanese Society for the Promotion of Science (JSPS) in Washington, D.C.

Since the other article already describes the 28-April meeting, I will concentrate here on other one. The meeting was graciously hosted by the new director of JSPS in Washington , Mitsuaki Nozaki, former Asian Director for ILC's Global Design Effort. It was attended by Diet members Mr. Ryu Shionoya and Mr. Shun-ichi Suzuki and several researches from Japan, including Satoru Yamashita, Hitoshi Murayama, Atsuto Suzuki and several others. The purpose of the meeting was to update our Japanese colleagues on activities related to ILC in the US. The attendance from the US and from Europe consisted of Lyn Evans (LCC Director), Andy Lankford (HEPAP chair), Jim Siegrist and Michael Salamon (DOE), as well as represenatives from US institutions: Mike Harrison, Paul Grannis, Dmitri Denisov, Jim Brau, Andy White, Marc Ross, and myself.

The meeting started with status reports on High Energy Physics Advisory Panel **(**HEPAP) and P5 (Lankford), US status (Siegrist), ILC status (Evans) followed by activity reports on superconducting radio frequency (SRF) R&D at Fermilab (Denisov), the Linac Coherent Light Source (Ross), ILC detector Ttchnology (White) and international collaborations (Grannis).

The agenda and talks are at https://agenda.linearcollider.org/event/6745/.

LCC Deputy Director Hitoshi Murayama (left) explains ILC physics to Japanese Diet members Mr. Suzuki (middle) and Mr. Shionoya (right) at JSPS Washington

In my mind the situation in the US can be best described like this: following the P5 recommendations there is support in the US for participation in the Linear Collider Collaboration, support for accelerator R&D in areas where the US contributes uniquely and an overall effort in SRF R&D to improve cavity performance, which might lead to a cost reduction in the overall ILC project. Efforts on physics and detector developments and R&D exist, but are at a minimal level.

At the meeting a handout was distributed by our Japanese colleagues, in which the suggestion was made for a US- Japan congressional caucus to be formed to discuss scientific and technical projects like nuclear energy, the International Space Station, advanced computing, or future colliders, with ILC as the obvious intended focus. This was also raised at the meeting on 28 April, but not as concrete as it was described at this meeting. It was also suggested that a US researcher be identified who would be the conduit to the caucus to educate and inform them of developments.

The handout and proposal by our Japanese colleagues, was a new suggestion and a bit of a surprise to the US side, but it was decided that the American Linear Collider Committee (ALCC) would take this under consideration and see how these suggestions can be implemented in the US and in the US system. This has been discussed at the follow-up ALCC meeting at the beginning of May. As another follow-up to the 28-April meeting there was a meeting between US researchers and the president of the Hudson Institute, Ken Weinstein. The purpose of the meeting was to provide some more background to the Hudson Institute on high-energy physics, its global nature and how the ILC fits in, as well as to start exploring how this institute may help with making the ILC part of a broader Japan-US science and technology framework that enables discussions between the two countries, including the ILC.

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AROUND THE WORLD

The European XFEL – helping pave the way for the ILC

Ricarda Laasch | 11 June 2015

The accelerator for the European XFEL is taking shape at impressive speed. Image: DESY, Dirk Nölle

The European XFEL at DESY, Germany, will be a brilliant light source for a broad range of fundamental research in all areas of science – but it is also the first great mass production of the so-called TESLA technology. This particle accelerating technology was developed by DESY together with its collaborators within the TESLA project and has now been transferred into industrial mass production to build the European XFEL. This is the first time that accelerator modules based on the superconducting radio frequency TESLA technology, are completely mass-produced in industry. And even though such a challenging industrial production is already needed for the European XFEL, this is not the end of the line. After all, the European XFEL's big brother is the International Linear Collider, and they share the TESLA technology. The ILC community is thus watching the construction of the European XFEL very closely.

"The ILC's mission is to provide an accelerator and the infrastructure for experiments that can explore the structure of matter and the universe with unprecedented precision." This statement by Brian Foster, European Director in the LCC, encompasses the three key goals of the ILC: Measuring the newly discovered Higgs boson with high precision, understanding the properties of the top quark, and searching for new particles beyond known physics. The Higgs boson was discovered at the Large Hadron Collider (LHC) at CERN in 2012, and with it the last part of an established theory could be finally proven. The top quark, on the other hand, may not be a new discovery but the particle itself still raises a lot of questions; and finally there is always the physics beyond what is known – or in this case the search for new particles.

Cavity mass production at the Italian company Zanon. Image: DESY, Heiner Müller-Elsner

The big question now is if a machine like the ILC is actually needed given that we already have the LHC. The world community answers with a clear 'Yes, it is.'. To show the importance for the community hundreds of physicists explain why they need the ILC in short videos – see here to find out more about the #mylinearcollider campaign. The ILC and LHC will be like a pan and a pot. It is possible to cook a meal with just one of the two, but for a greater variety of meals having both is essential. So the community is convinced that both machines are needed to fully understand the Higgs boson and other particles our universe has.

A machine such as the ILC needs a great global effort to be brought into existence. To make this happen every possible source of information and knowledge is needed. This is where the European XFEL enters the stage. In the scope of the ILC, the European XFEL acts as a prototype for technical design, project planning and construction phase. Both machines basically use the same TESLA technology for acceleration of the particles.

At DESY Nick Walker, a physicist and Global Coordinator for ILC Accelerator Design & Integration, has his eyes on the XFEL production. In his 20 years working for DESY at the machine group he has mostly worked on the TESLA project and its successor, the ILC. Right now he is projecting the numbers learnt from the European XFEL production into the ILC frame. For example he compares the performance of the superconducting TESLA cavities, the power drivers for the particles in the accelerator: “The overall approach to module production, from niobium sheets to accelerator modules, for the ILC is fundamentally taken from XFEL,” he says. The European XFEL will have 800 such superconducting cavities in 100 accelerator modules, while the ILC will have 16 000 cavities in about 2000 accelerator modules. The cavity and module production for the European XFEL was the first real industrial production for these specific parts of an accelerator and of course the ILC will handle it nearly the same way. “The cavities are a great success. Although we are a tad shy of the ILC goals they confirm the choice for the used recipe,” Walker stresses. And with 80 percent of the cavities reaching a gradient (the accelerating strength) of 33 megavolts/metre(MV/m) at the current status of the XFEL production together with an ILC goal of 90 percent at 35MV/m, this is a potential achievable goal for the ILC.

The cavity production is not the only influence the ILC can carry over to their project. Many other aspects of the project are very helpful for the further planning and designing of the whole ILC project. “The ILC cost estimates are effectively projections of the known XFEL costs, which puts ILC on solid ground,” is another benefit of the European XFEL which Walker emphasises. For an international project of this scope not all contributions from participants are financial. Some ‘in-kind contributions’ have to be handled differently. For these in-kind contributions the European XFEL has some well-functioning examples: the Institute of Nuclear Physics Polish Academy of Science (IF-PAN) sent a team of 27 skilled physicists, engineers and software engineers to DESY to provide needed manpower for the whole project duration. This team runs the important cavity and module test facility AMTF at DESY. Another example of those contributions is the accelerator module assembly which takes place in Saclay, near Paris, France. The modules are finished on the grounds of the Commissariat à l’Énergie Atomique et aux Énergies Alternatives (CEA) and then sent to Germany for testing and installation into the accelerator. Here not only industrial manpower, but also laboratory space was offered and used in the production. The LAL laboratory in Orsay, France, has a similar story: they are responsible for testing and conditioning the so-called high-power couplers – another key component of the technology. Those two are just examples for the different kinds of contributions from many laboratories to the European XFEL construction (for further contributions see here). For the ILC these contributions could be scattered all around the globe – which means good planning and identifying possible problems is the key to success.

The European XFEL has started the first industrial mass production of cavities and accelerator modules. For all the scientists involved in this project this is a completely new situation. And as with everything new in life one has to learn how to do it well. And even this learning curve along the production and construction of the European XFEL will be beneficial for the ILC: the community can learn where more attention is needed or further development of parts or other design plans could be included. All these details give the ILC an opportunity which no other project this size has.

Even after the production phase during the installation, commissioning and finally operation of the European XFEL, the ILC community will still be there and watching intensely. Here the European XFEL will give the ILC community invaluable experience for all the needed steps to build a machine in this global scale with the same set of technology behind it. The installation of the ILC will by nearly 20 times larger, and this is a real challenge on manpower, logistics and planning. So it is important to learn everything possible from the European XFEL which will help the ILC to be prepared.

Of course, Nick Walker and his colleagues in the ILC community will keep a close eye on the European XFEL project: “No doubt lessons will be learnt here [at XFEL] that will influence the ILC design.”

CEA | CNRS/IN2P3 | CNRS/LAL | DESY | EUROPEAN XFEL | INDUSTRIALISATION | SCRF | SUPERCONDUCTING CAVITY | TESLA TECHNOLOGY

LHC experiments are back in business at a new record energy

03 Jun 2015

** For photos, videos and the webcast, please see here **

Geneva, 3 June 2015. Today, CERN[1]'s Large Hadron Collider (LHC) started delivering physics data for the first time in 27 months. After an almost two year shutdown and several months re-commissioning, the LHC is now providing collisions to all of its experiments at the unprecedented energy of 13 TeV, almost double the collision energy of its first run. This marks the start of season 2 at the LHC, opening the way to new discoveries. The LHC will now run round the clock for the next three years.

"*With the LHC back in the collision-production mode, we celebrate the end of two months of beam commissioning,"* said CERN Director of Accelerators and Technology Frédérick Bordry. "*It is a great accomplishment and a rewarding moment for all of the teams involved in the work performed during the long shutdown of the LHC, in the powering tests and in the beam commissioning process. All these people have dedicated so much of their time to making this happen.*"

Today at 10.40am, the LHC operators declared "stable beams", the signal for the LHC experiments that they can start taking data. Beams are made of "trains" of proton bunches moving at almost the speed of light around the 27 kilometre ring of the LHC. These so-called bunch trains circulate in opposite directions, guided by powerful superconducting magnets. Today the LHC was filled with 6 bunches each containing around 100 billion protons. This rate will be progressively increased as the run goes on to 2808 bunches per beam, allowing the LHC to produce up to 1 billion collisions per second[2].

During the first run of the LHC, the ATLAS and CMS experiments announced the discovery of the so-called Higgs boson, which was the last piece of the puzzle known as the Standard Model, a theory that describes the fundamental particles from which everything visible in the universe is made, along with interactions at work between them.

"*The first 3-year run of the LHC, which culminated with a major discovery in July 2012, was only the start of our journey. It is time for new physics!*" said CERN Director General Rolf Heuer. "*We have seen the first data beginning to flow. Let's see what they will reveal to us about how our universe works.*"

With run 2 starting today, physicists have the ambition to further explore the Standard Model

and even to find evidence of new physics phenomena beyond its boundaries, which could explain remaining mysteries such as dark matter, believed to make up about a quarter of the universe, or nature's apparent preference for matter over antimatter, without which we would not exist[3].

Over the two-year shutdown, the four large experiments ALICE, ATLAS, CMS and LHCb also went through an important programme of maintenance and improvements in preparation for the new energy frontier[4].

"*The collisions we are seeing today indicate that the work we have done in the past two years to prepare and improve our detector has been successful and marks the beginning of a new era of exploration of the secrets of nature,"* said CMS spokesperson Tiziano Camporesi. *"We can hardly express our excitement within the collaboration: this is especially true for the youngest colleagues."*

"*The successful restart of physics data-taking, with all systems in great shape to collect, process and analyse the new data quickly, is a testament to the commitment and immense hard work of very many people from across ATLAS during the long shutdown,"* said ATLAS spokesperson Dave Charlton. "*We are now starting to delve into the new data to see what nature has in store for us at these new unexplored energies.*"

"All within the collaboration are tremendously excited that the new run has now begun," said LHCb spokesperson Guy Wilkinson. *"It will allow us to follow up on puzzles from our run-1 studies, and to probe with higher sensitivity the difference in behaviour between matter and antimatter."*

"Proton-proton collisions will provide essential reference data for the run with heavy-ion beams foreseen for the end of the year, in which the LHC will provide both higher energy and luminosity as compared to run 1," said ALICE spokesperson Paolo Giubellino. "*In addition, we plan to extend the exploration of the intriguing signals that have emerged from Run 1."*

In addition to these large collaborations, three smaller experiments – TOTEM, LHCf and MoEDAL – will be among those searching for new physics at the LHC's new energy frontier of 13 TeV[5].

Footnote(s)

1. CERN, the European Organization for Nuclear Research, is the world's leading laboratory for particle physics. It has its headquarters in Geneva. At present, its member states are Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Israel, Italy, the Netherlands, Norway, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland

and the United Kingdom. Romania is a Candidate for Accession. Serbia is an Associate Member in the pre-stage to Membership. Turkey is an Associate Member. India, Japan, the Russian Federation, the United States of America, the European Union, JINR and UNESCO have observer status.

2. See 'LHC Season 2: facts & figures' :http://press.web.cern.ch/backgrounders/lhc-season-2-facts-figures

3. See LHC Season 2: New frontiers in physics :http://press.web.cern.ch/backgrounders/lhc-season-2-new-frontiers-physics

4. See LHC Season 2: Major work at the experiments for Run 2 :http://press.web.cern.ch/backgrounders/lhc-season-2-major-work-experimen...

5. Smaller LHC collaborations to analyse collisions at 13 TeV :http://home.web.cern.ch/about/updates/2015/06/smaller-lhc-collaborations...

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VIDEO OF THE WEEK

Steven Weinberg and Gerard ‘t Hooft join #mylinearcollider

11 June 2015

“Nature is a lot smarter than we are,” says theoretical physicist and Nobel laureate Gerard ‘t Hooft n his contribution to the #mylinearcollider campaign. As a theorist, it’s in his interest to figure out how the laws of nature work, and no matter how hard we think about them – we need experimental evidence for our theories, he says. A linear collider could give us many details, and after all the quest to find out how nature works has been beneficial for mankind.

His colleague Steven Weinberg from the University of Texas in Austin agrees that a linear electron-positron collider like the ILC could explore physical processes with great precision. “The detection of even small departures from theoretical predictions can open up a whole new world of previously unknown physics,” he says. “A linear electron-positron collider can be a wonderful instrument.” Weinberg also supports Japan as a host site for the linear collider. He points out that while the data produced there will benefit the whole world of physics, the host country in inevitable receive the greatest benefit in the form of technological spin-offs and a well trained new generation of scientists. He thinks Japan is a “natural” host and that “it is time for Japan to begin to play a leading role in accelerator technology. It would be very wise for Japan to host the project and very wise for the whole world of science to support it because of the data and the insights that this kind of accelerator will produce.”

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