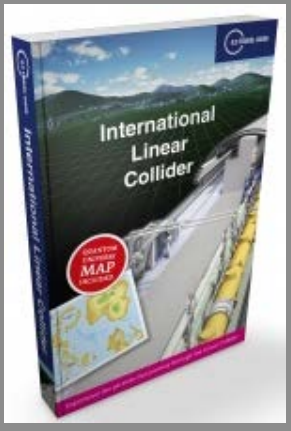
NEWSLINE
THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY



Special issue: The ILC guide to Kitakami 3

Japan might seem difficult to understand at times. There are unwritten rules and a societal order that can trip up foreigners and make communication awkward. But if the ILC comes to Japan, many people will move there from all around the world. So what is really happening there at the moment? What's it like being a researcher in the region? And what would make life easier for researchers who move there in the future? Our third "Life in Kitakami" special issue addresses all these questions. Here are volumes 1 and 2.

DIRECTOR'S CORNER

ILC: What's happening in Japan

by Lyn Evans

With a technical design well in place and R&D continuing on accelerator and detectors, the community is waiting for the next big milestone to occur towards the realisation of the ILC. Apart from crucial next results from the Large Hadron Collider at CERN, all eyes are on the potential ILC host Japan. So what's happening in Japan? Linear Collider Collaboration Director Lyn Evans takes stock

AROUND THE WORLD

Making Kitakami your home

by Rika Takahashi

A working accelerator and detectors that take accurate data are great – but there's more to life than that. If the ILC goes to Japan, it will attract scientists from around the world, who will be moving with their partners and families who will need houses, schools, jobs and paperwork. In a symposium held at Oshu city hall, local representatives discussed with potential future residents what it takes to make the ideal ILC town.

PROFILE

The fall and subsequent rise of the ILC project through the eyes of a particle physicist journeyman

by Joykrit Mitra

The ILC project has witnessed some ups and downs in the past decade. The story told through the career of a physicist involved with ILC detector research and development who experienced it directly, from his days as a graduate student till now, as a researcher in Japan.

IN THE NEWS

from ***Global Construction Review***
17 September 2014
Arup is chosen to engineer Europe's 100km particle accelerator
Arup has been appointed by the European Organisation for Nuclear Research (CERN) to work out the design and geoengineering of the 100km tunnel that will accommodate the proposed Future Circular Collider (FCC).

from ***Iwate Nippo***
15 September 2014
建設候補地の背景を説明 一関でサイエンスカフェ
一関市主催の「いちのせきサイエンスカフェ」は　日、同市大手町の一関図書館で開かれた。国際リニアコライダー　の東北誘致に取り組む東北大大学院の佐貫智行准教授が講演した。(On 14 September, Ichinoseki Science cafe was held at city's public library, and Tomoyuki Sanuki, who is working on to ILC realisation in Tohoku gave a talk.)

from ***New Scientist***
15 September
Two views of the future of science in Scotland
Would Scottish science benefit if the country became independent of the UK? Two academics offer contrasting views

from ***Fermilab Today***
11 September 2014
Epic facepalm
If you're a science enthusiast, this week you have likely encountered outlandish headlines invoking Stephen Hawking, the Higgs boson and the end of the universe.

from ***livescience.com***
8 September 2014
New Particle Detector Could Reveal Universe's Missing Antimatte
A new ultra-precise particle detector is being developed to investigate the bizarre properties and behaviors of tiny elementary particles that seem to defy the laws of traditional physics.

from ***Iwate nippo***
7 September 2014

候補地の環境知る 奥州、海外研究者らが会議

国際リニアコライダーの測定器「　　」研究チームによる国際会議は　日、奥州市内で、　日間の日程で始まった。欧州を中心に　カ国から　人が参加。　　の建設候補地に北上山地　北上高地　が決まったことを受け、周辺の生活環境などについて意見交換した。 4-days international workshop for ILC's particle detector, ILD has started on 6 September in Oshu city. 85 scientists from 13 countries attended the workshop. They discussed about the living environment in reaction to the decision of Kitakami mountain to be a prime candidate site for the ILC.)

from ***Tanko Nichinichi***
5 September 2014

関連・国際会議 出迎える現場 腕の見せどころ

水沢区で　日から　日にかけ「　　ミーティング　　」が開かれる。訪れる研究者は　人余り。このうち約半数が外国人だ。　　誘致とそれに伴う国際研究都市を目指そうとしているだけに、ノウハウを積み重ねる絶好の機会になるかもしれない。(From 6 to 9 September, ILD meeting 2014 will be held in Mizusawa district. About 80 scientists will visit the area, and half of them are from overseas. This will be an ideal opportunity to study the ins and outs to take care of the foreign scientists who might visit or live in the area if the ILC to be built.)

CALENDAR

Upcoming events

3rd International Beam Instrumentation Conference (IBIC 2014)
Monterey, California, USA - hosted by SLAC
14- 18 September 2014

International Workshop on Future Linear Colliders 2014 (LCWS14)
Vinca Institute of Nuclear Sciences, Belgrade, Serbia
06- 10 October 2014

25th FCAL Workshop
Vinca Institute of Nuclear Sciences, Belgrade, Serbia
12- 13 October 2014

The 11th ICFA Seminar on Future Perspectives in High-Energy Physics 2014
IHEP, Beijing, China
27- 30 October 2014

View complete calendar

BLOGLINE

5 September 2014
Jan Strube
The ILC site visits

PREPRINTS

ARXIV PREPRINTS

1409.3199
Limiting two-Higgs-doublet models

1409.3123
Simulations and measurements of beam loss patterns at the CERN Large Hadron Collider

1409.1961
Overview and Issues of Experimental Observation of Microbunching Instabilities

1409.1196
High Energy Colliding Beams; What Is Their Future?

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DIRECTOR'S CORNER

ILC: What's happening in Japan

Lyn Evans | 18 September 2014

This article contains more detailed information and updates concerning the on-going ILC decision process in Japan. The main components of this process were already introduced by Hitoshi Yamamoto in the 24-July issue of LC NewsLine.

The first meeting of the Particle and Nuclear Physics Working Group held on 24 June. Image courtesy: Iwate Nippo

In September 2013, the Science Council of Japan (SCJ) published a report on the ILC. This report contains two key statements and requests.

Concerning the scientific justification for the ILC:

"The Committee appreciates that the ILC enables the precision measurements of the detailed properties of the Higgs particle and the top quark, thereby exploring the physics beyond the Standard Model of particle physics and, therefore, it acknowledges that the ILC is endowed with the scientific value in particle physics. The Committee, however, expresses the desire for more compelling and articulate argument to justify the ILC project in order to search for unknown particles and the physics beyond the Standard Model, running concurrently with the upgraded LHC, given the considerable investment it will require."

Concerning the project cost:

> "Before making the final decision of whether the ILC should be hosted in Japan, the issues and concerns described in this document should be fully investigated and a clear vision for solutions needs to be provided. They include the whole profile of project cost for the construction, operation, upgrades and decommissioning, as well as prospect for cost-sharing among the countries involved. Also included are the issues related to human resources and management/operation organization."

In response, the Ministry of Education, Sports, Science and Technology (MEXT) set up a "Task force for ILC" under the vice-Minister, which itself set up an "Academic Experts Committee" which first met in May 2014. At that meeting the committee formed two working groups in order to respond to the two key requests of the SCJ.

In order to address the scientific issues a "Particle and Nuclear Physics Working Group" led by Takaaki Kajita (Director of the Institute for Cosmic Ray Research, University of Tokyo) was formed. The timetable and subjects for meetings of this Working Group as known so far is as follows:

24 June 2014: Status of Particle Physics and ILC physics overview. (Minutes in Japanese)

29 July 2014: Future prospects in the US and Europe (Minutes in Japanese)

27 August 2014: Cosmic ray and Astrophysics and ILC.

22 September 2014: Flavour and neutrino physics and ILC

21 October 2014: Interim summary to be reported to Experts Committee.

In order to address technical issues, a "*Technical Design Report* Validation" Working Group has been formed under the leadership of Hideaki Yokomizo (Former Trustee of JAEA). The first open meeting of this working group was held on 30 June 2014, giving an overview. Further working group meetings are in progress for detailed discussions on the TDR contents with cost-estimates in closed sessions.

Information is being fed to this working group through the ILC Planning Office at KEK after verification by the LCC. Note that at the present time, this is a purely internal Japanese process. All committee and working group members are Japanese and no input is requested from outside Japan except indirectly through the LCC so far.

In addition to setting up this Committee and its Working Groups, on 19 August MEXT published a Call for Tender for a survey:

"Research, survey and analysis on technology spinoffs and subsequent economic ripple effects expected from the International Linear Collider (ILC) project and the global trend of the particle/nuclear physics research including technology R&D."

This survey will be conducted by a private company, yet to be chosen, and should be completed by the end of March 2015. It is expected that this company will consult with the major laboratories world-wide.

I hope that the upcoming LCWS14 workshop in Belgrade will help refine the scientific arguments and differentiate the International Linear Collider from the other proposed lepton colliders and help our Japanese colleagues to feed correct and compelling arguments to the working groups.

ASIA | ILC HOSTING | JAPAN | MEXT | SCIENCE COUNCIL OF JAPAN

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AROUND THE WORLD

Making Kitakami your home

Rika Takahashi | 18 September 2014

Scientists at the special session at ILC meeting in Oshu city From left: Mary-Cruz Fouz , Spain, Marcel Demarteau ANL, USA, Jenny List, DESY, Germany, Mark Thomson, Cambridge, UK, and Vincent Boudry , IN2P3, France Image: Rika Takahashi

From August to September, four ILC-related workshops were held around the potential construction site for the International Linear Collider. ILC scientists from all around the world were warmly and enthusiastically welcomed by local supporters, and had a glance of what life will be like at the candidate site.

On the evening of 6 September, a special session to discuss the creation of the ideal ILC town was held at Oshu city hall. Five scientists who attended the ILD meeting frankly exchanged views on a wide range of issues with local representatives Tokiko Onuki, Campus Designer of Tohoku University, Bill Lewis, Chair of the ILC support committee in Oshu city, Amanda Krips, public relations officer of Iwate prefecture, and Akira Kamei from Oshu city's International Linear Collider Division.

Onuki, who is leading a local development working group towards the ILC at Tohoku University, made an investigation of existing infrastructures, for example the density of essentials for life such as schools, hospitals or shopping centres. Based on the study, she proposed three different models for the ILC campus locations. Type one is the location close to the beam collision point, and type two is near the Shinkansen bullet train station. The third candidate is in between type one and two. Onuki said that the area has a comfortable basic infrastructure and well-developed social services, however there will be more to do. "I believe that we need to create new education systems, and more multi-lingual support should be provided." She also pointed out that people have a variety of lifestyles, and to decide which type of location is most desirable, asked the scientists to fill out a questionnaire to gather opinions from the residents-to-be.

Krips, who has been living in Iwate prefecture for five years, said she had trouble fitting into Japanese society at first. "The language barrier was the biggest problem," she said. Getting a driving license was a prime example. "I needed to fail the exam three or four times before getting it!" She also had a hard time communicating with people, and knows some foreign residents who went back to their home country because they felt isolated. But she said it doesn't mean that the people in the area are mean to foreigners. "It is just a lack of experience. For example, the concept of 'vegetarian' is not fully understood by Japanese people, so they don't know how to deal with it." In fact, after she got know people, and people got to know her, not only did she feel more comfortable, but now thinks it is a wonderful place to live. She introduced new activities with an eye toward the ILC in the area, such as international association formed by foreign residents, or English teaching programmes. "I don't think this place will suddenly become a fluent English speaking area, but things are growing. Your opinion and constructive ideas are very important, and they are listening," she called for opinions from scientists.

In the second half of the session, scientists in the panel gave their impressions of the site.

Jenny List, scientist at DESY laboratory, Germany, said it was very impressive to see the enthusiasm of the local people to invite the ILC. Scientists saw many posters to welcome the ILD meeting in front of the stores, and signs by the road while visiting the candidate

construction site. Mark Thomson form Cambridge University in the United Kingdom said that he was also impressed by people's enthusiasm, and the natural beauty around the site.

Both List and Thomson felt needs to secure jobs for spouses. Jobs for spouses who live in foreign countries are always an issue at every lab around the world. Local governments are keen to tackle this problem, and are discussing legal and working systems. Thomson also argued for good international schools.

Another local expat representative, Bill Lewis, has been living in Oshu for more than two decades. He says Iwate is "a great place to raise a family." His children attended local public schools, and they received a good education, presenting the alternative of children of researchers attending local schools. He also said there are some jobs available if you are flexible, introducing his experience working at the supermarket "I did not speak any Japanese back then, but I learned a lot there," suggesting a way to assimilate into the community.

There were more useful inputs from scientists such as the difference in the sense of commuting. To Japanese, commuting for one hour is not a big deal. But it could be a burden for many foreign scientists. "You say that it is only two hours from Tokyo to get to the site, and it is very convenient. Well, I would not really call that convenient," said Vincent Boudry, from CNRS/IN2P3 in France. Food is another issue. "Even though Japanese food is excellent, we will miss our food, like French cheese and European breads," Boudry said.

"It is just a beginning," said Kamei, who is in charge of the communication activity for foreign residents in Oshu city. "We will welcome your suggestions and opinion. Please do not hesitate to contact us any time," he said. Oshu city is producing the video entitled "Oshu for you" to introduce the life in the area. You can also write up comments on the videos.

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PROFILE

The fall and subsequent rise of the ILC project through the eyes of a particle physicist journeyman

Joykrit Mitra | 18 September 2014

In the fall of 2001, an exchange student from Germany arrived at the University of Oregon expecting to stay a year, with particle physics not very high on his list of career priorities. But a graduate level particle physics class and an ensuing summer project on Higgs branching ratios changed all that.

Jan Strube, Particle physicist Journeyman

Impressed by Jan Strube's performance, James Brau, professor of physics at the university, recruited his student to join his research group, which was part of the BaBar experiment at SLAC, one of the leading university groups in detector research and development in the United States. It was a small step on a much longer path that would eventually lead to the International Linear Collider.

After finishing the class requirements for his Ph.D. at Oregon, Strube moved to the San Francisco Bay Area to study a rare decay of a type of B meson that was being detected in the debris of electron-positron collisions, at the PEP-II collider at SLAC.

At the time, the much sought-after Higgs particle hadn't been detected – indeed, CERN's Large Hadron Collider had not yet been turned on. Yet the ILC was anything but a distant dream. Although the 'international' part of the name was not yet in vogue and the technical design was far from finalised, there was still considerable urgency to build the machine. Strube remembers working with a post-doc at Oregon at the time, who hoped to be working on the ILC as early as 2005.

"I had originally expected to start working on the ILC after graduation right away," Strube recounts.

RUTHERFORD APPLETON LAB

But in late 2007, just when he was finishing his Ph.D. the powers that be pulled the plug on funding for high-energy physics in the United States. Shortly after, equally severe cuts were announced in the UK. Since national projects were under threat, plans for the International Linear Collider could not be entertained.

Strube had already accepted a postdoc position at Rutherford Appleton Laboratory in the UK, but he was shielded from the consequences. His postdoc position survived because it was research on the LHC ATLAS experiment as well as detector development for the ILC. Only the ILC component was slashed.

Strube recounts the grim milieu shortly after the UK announcement. UK particle physicists working on the ILC had to remold their work as generic research and development. Unable to use 'ILC', or even the word 'Linear' in the project title, they used names such as 'Generic Lepton Collider' or 'Generic Future Accelerator'. It was the only way to save their projects.

Meanwhile, high-energy physics budgets in other countries seemed resilient, and international conferences for the ILC continued to occur. Despite financial difficulties, Strube and his supervisor Marcel Stanitzki managed to forage funds to take part in the important detector validation process. In 2008 they attended the SiD(Silicon Detector) workshop at Boulder, Colorado by sharing hotel rooms. At the conference, physicists working on ILC detectors worldwide prepared to narrow down the four ILC detector concepts to the two most viable ones. In that same year, they also attended the Linear Collider Workshop in Chicago.

Still, Strube had low expectations about future work on the ILC. ATLAS was still a safer bet for a postdoc, in spite of the technological glitch temporarily delaying the LHC from starting operation in 2008. During the short downtime, Strube witnessed two ILC research and development programs being approved for funding at Rutherford Appleton, and then cut at the last moment. They were frustrating times, for Strube and linear collider R&D.

CERN

Despite this, Strube wasn't entirely isolated from the ILC. In 2008 he also joined the newly formed linear collider detector group at CERN, which started off using ILC detector designs and ILC software, tweaking them for the CLIC environment. In 2010, Strube ended up as one of the chapter editors for the CLIC's Conceptual Design Report which was still being compiled. In 2011, he accepted a fellowship at CERN to work on the CLIC.

"All the other fellowship offers I had were purely LHC projects," Strube said. "CLIC wasn't the ILC, but it was another linear collider and there was considerable overlap."

There was substantial synergy between the CLIC and the two working ILC detector groups despite them being competing projects.

Once Japan became the leading contender for hosting the ILC project, it was natural for Strube to return to what he'd dreamed of doing as a graduate student.

WORKING IN JAPAN

Jan Strube and his wife during their wedding in April 2008

Strube had married a Japanese girl whom he met as an exchange student, so the prospect of more permanency in Japan was always in the picture. He accepted a full-time position at Tohoku University starting early 2014, where he teaches the physics of B meson factories. Tohoku is also the designated site for ILC construction.

When he isn't overseeing graduate students working towards their Ph.D., Strube is the deputy liaison for Hitoshi Yamamoto—associate director for physics and detectors in the Linear Collider Collaboration— for detector research and development.

Strube helps Yamamoto keep a detailed census of all detector research groups – what projects each is working on, their manpower, the future course each group expects to take and their funding scenarios. Strube helps document how each group will be able to contribute to the ILC project when the time comes. He helps create a detailed survey of the field.

Strube was pleasantly surprised by the breadth of projects Japanese ILC scientists were involved with. He expected to find mainly simulation studies and theorists playing with models. But he found that his colleagues at Tohoku were also highly involved with infrastructural planning.

Associate professors at Tohoku were already active in industrial and economic forums and keeping local government officials informed. The amount of local support was evident from the signs made by the local community and a big showcase depicting the ILC at the Ichinoseki train station. A detailed plan of the ILC campus is currently being developed so that foreigners can live and work comfortably, even though the project hasn't officially been approved. Recently, both detector groups scouted the point where the two beams will interact from a civil engineering standpoint, to gauge how to get the necessary parts there and if bridges en route are equipped to handle the weights.

"The Japanese like to have everything in place when they make an announcement," Strube said. "When they say something, they know

it works."

These days Strube runs a blog cataloging life in Japan, the cultural differences foreigners are likely to face, the practical barriers they need to prepare for, as well as his thoughts on particle physics. He hopes it will be of use to other particle physicists moving to Japan. Hopefully, they'll be ILC physicists.

DETECTOR R&D | ILC | SID