FEATURE

From Symmetry Magazine: Small cat, big science

by Ricarda Laasch

Hello Kitty is known throughout Japan as the poster girl (poster cat?) of kawaii, a segment of pop culture built around all things cute. But recently she took on a new job: representing the proposed International Linear Collider.

DIRECTOR'S CORNER

Powering detector developments

by Hitoshi Yamamoto

There’s a fitting phrase for the funding landscape of international high-energy physics projects: “It’s complicated.” Hitoshi Yamamoto, Director for Physics and Detectors in the Linear Collider Collaboration, describes the various sources of financial support, especially for developing future detectors, and where all of them stand. His advice: use all the opportunities there are.
Particle scientists are cool!

Image: Nobuko Kobayashi

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Read also "Five Iwate junior high students return from a fulfilling study trip abroad," an article published on 10 August in the Iwate Nippo.
IN THE NEWS

from *Iwate Nichi Nichi*  
20 September 2016  
**ILC誘致者を利用者へPRへノ関駅に看板**  
JR一ノ関駅西口の入り口ひさし中央部に、県南部の北上山地（北上高地）への誘致が期待される次世代の大型加速器「国際リニアコライダー（ILC）」のPR看板がお目見えました。（At the entrance of Ichinoseki railway station, advertisement board for the ILC was posted to increase public awareness.

from *Spektrum der Wissenschaft*  
14 September 2016  
**Wer baut den nächsten Super-Beschleuniger?**  

from *Iwate Nippo*  
11 September 2016  
**物理学視点からILCに理解 奥州で技術推進シンポ**  
岩手日報社主催のILCクラブで8月にスイス・ジュネーブの欧州合同原子核研究所（CERN）を訪問した奥州・水沢中3年の菅原百代さんと一関・花泉中2年の佐藤琴恵（ことみ）さんがパネル討論した。（Momoyo Sugawara and Kotomi Sato, who visited CERN in August joined panel discussion at the ILC symposium held on 10 September in Oshu city.

from *Iwate Nichi Nichi*  
11 September 2016  
**暗黒物質解明に期待 ILC 奥州でシンポ**  
先端加速器科学研究シンポジウム2016 in 北「1から分かるILC」は10日、奥州市水沢区の市文化会館（Zホール）で開かれた。（A symposium entitled “ILC for dummies” was held in Oshu city on 10 September.

from *The Morioka Times*  
4 September 2016  
**Nurturing a sense of adventure about the ILC at Makibori Elementary in Morioka – Science and dreams with the Engineering Girls**  
One of the Engineering Girls, third year science and engineering student Yuki Wada (20 years old, from Morioka City) said, "The children who listened to our lecture today will be adults when the ILC will start its experiments. I hope they gain an interest in the mysteries that surround them every day.”  
(Full translation provided by *Iwate & the ILC* website.)

from *Élémentaire (N°9)*  
September 2016  
**Faut-il tourner en rond… ou bien aller tout droit ?**  

Download full publication here.

from *Tanko Nichinichi*  
30 August 2016  
**東北ILC準備室 仙台に事務所（広域基本計画を来年半ばに策定へ）** (Physical office opened for the Tohoku ILC Preparation Office in Sendai – A basic plan for the greater region to be established in mid-2017)  
同準備室で広域基本計画を担当する東京大学の山下教授は「ILCが実現することによってどんなことができるか考え、地域の方々に参加してもらうことによって波及効果が表れる。いかに多くの方々に参加してもらうかが勝負となる。そういう観点からすると、準備室が出た役割の中でも、広報部門は非常に重要な役割を担うことになる」と話す。

(Dr. Satoru Yamashita [who] will be in charge of creating the basic plan for the greater region at the Preparation Office [...] said, “We will think about what will become possible should the ILC become a reality, and we will see many spinoff effects because of the participation of people around the region. The more people get involved, the higher the chance we will succeed. If you look at it that way, the role of PR will become more and more important as we prepare for the project.”)

Read full translation provided by *Iwate & the ILC* website here.

from *The Morioka Times*  
28 August 2016  
**Formal request for the reconstruction and the ILC: the Association of Town/Village Council Chairs meets with the Governor of Iwate**  
Their formal request had 13 items, including:  
- A faster reconstruction from the Great East Japan Earthquake and Tsunami  
- The realization of the ILC  
- Attracting businesses and jobs to the region
– The continuation of running some prefectural high schools
(Full translation provided by Iwate & the ILC website.)

from Tanko Nichinichi
4 August 2016
候補地最寄り駅で誘致PR（水沢江刺駅東口に看板）(ILC sign installed at Mizusawa-Esashi station, the nearest station to the candidate site)
水沢区羽田町のJR水沢江刺駅（寺田亮司駅長）の東口広場に3日、国際リニアコライダー（ILC）の誘致をPRする看板がお目見えした。市が設置準備を進めていたもので、市内外の駅利用者に対し、大型科学プロジェクトの誘致をアピールしていく。
(On July 23rd, a sign for the ILC project was installed for people walking by the east exit plaza of JR Mizusawa-Esashi Station (Hada-cho, Mizusawa district, Oshu City). The Oshu City government prepared this sign to spread the word about this large-scale science project to all of those who use the station.)
Read full translation provided by Iwate & the ILC website here.

CALENDAR
Upcoming events
Corfu Summer Institute
Corfu, Greece
31 August- 23 September 2016
6th Low Emittance Rings Workshop (LOWeRING 2016)
SOLEIL, Gif-sur-Yvette, france
28 October 2016
View complete calendar

PREPRINTS
ARXIV PREPRINTS
1609.04343
Hadronic structure of the photon at small x in holographic QCD
1609.04185
2HDM Higgs-to-Higgs Decays at Next-to-Leading Order
1609.03995
Mixed electroweak-QCD corrections to e+e→HZ at Higgs factories
1609.03955
Mixed QCD-EW corrections for Higgs boson production at e+e− colliders
1609.03390
NLO QCD Predictions for off-shell tt̅ and tt̅H Production and Decay at a Linear Collider
1609.03018
Physics at a Higgs Factory

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Hello Kitty is known throughout Japan as the poster girl (poster cat?) of kawaii, a segment of pop culture built around all things cute. But recently she took on a new job: representing the proposed International Linear Collider.
Funding global endeavours like future particle detectors is rather complicated, with hundreds of institutes from around the world involved in the construction and operation. For a large particle physics project like the International Linear Collider (ILC), the accelerator and the detectors are generally funded quite differently. The accelerator typically costs an order of magnitude more than the detectors and its funding comes from governments through a handful of major laboratories or is directly pooled at the new central laboratory. On the other hand, the detectors are constructed by many groups of physicists belonging to tens or hundreds of institutions, and each group would obtain necessary funding in their own countries to construct parts of detector assigned to them. This is the funding model for, for example, the Large Hadron Collider at CERN.

With the Japanese government investigating the case for the ILC by an expert committee, we are not yet in the constructing phase but in a preparation phase which is likely to continue at least for a year or two. The difference of the funding pattern between accelerator and detectors in this period, however, is similar to that in the construction phase described above – apart from the fact that we do not have the new central laboratory yet. For detector efforts, it means that each group needs to secure funds from its own funding agencies. The funding situation, however, is quite different for North Americas, Europe, and Asia.

For the United States, a recent agreement between the Japanese funding agency MEXT (Ministry of Education, Culture, Sports, Science and Technology) and the US funding agency, the Department of Energy (DOE) as reported in the director’s corner by Harry Weerts on 8 September has a significant impact. This is the first agreement between the two funding agencies explicitly on the ILC, and it is indeed a big step forward. In concrete terms, they agreed to collaborate and focus on cost reduction of superconducting RF technology. It would have been nicer, of course, if they agreed on more forthcoming topics such as the governance of the new ILC laboratory or concrete cost sharing. The Japanese government, however, is officially evaluating the case for the ILC by the expert committee, and it cannot behave like there is a green sign for the ILC at this time. A more dire consequence of this is that, since there is no new and immediate funding, most of current funds for the ILC had to be moved to this one basket.

The ILC detector research and development in the United States has been largely supported in recent years by generic studies that are not limited to the ILC, and as such not affected significantly by the recent change in funding policy described above. On the other hand, detector developments specific to the ILC continue to be difficult to pursue, and travel funds to attend linear collider workshops are now more strained than before. There has long been a programme of US-Japan collaboration in high-energy physics and it has recently been renewed (see LC Newsline April 2016). In the renewed programme, funding is likely to be more symmetric between the US and Japan than before while in the past the funding came mostly from Japan.

The situation in Europe regarding the ILC detector funding is reasonable at this time thanks to variety of funding provided by the European Commission. One example is the AIDA project that supports R&D efforts for detectors at accelerators where the main users are LHC upgrades and linear colliders. Another is the E-JADE project that supports European researchers to work in Japan for
accelerator studies including linear colliders. Recently, it has become possible to use this programme for physics and detector activities as well.

The ILC detector activities in Japan have been supported mostly by competitive funds from the Japan Society for the Promotion of Science (JSPS). For the ten-year period of 2006 to 2015, two large JSPS programmes supported the ILC detector efforts at roughly $1M per year. An application for the following five years, however, was not successful and a new proposal is currently being prepared. This leaves a hole of at least one year that is being partially filled by a few smaller-size JSPS programmes as well as supports by KEK. At universities, there are also small amount of research funds that can be used quite flexibly.

Maybe I have convinced you that the global funding situation for the linear collider detector studies is highly complicated. In this phase of preparation, we should take advantage of all kinds of opportunities and pursue the necessary studies such as completing the loose ends of detector element technologies, realistic engineering designs, as well as further optimisation of overall detector designs and even more adventurous technologies. Yes, this is a time of perseverance, but also of excitement.
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