

NEWSLINE

THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

FEATURE

From Symmetry Magazine: Small cat, big science

by Ricarda Laasch

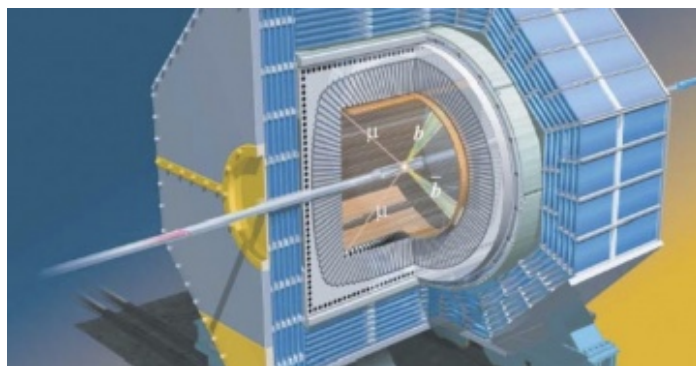


Hello Kitty is known throughout Japan as the poster girl (poster cat?) of kawaii, a segment of pop culture built around all things cute. But recently she took on a new job: representing the proposed International Linear Collider.

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

Junior high-school students Kotomi Sato and Momoyo Sugawara, members of the "ILC club," visited CERN last August with three other students to learn more about life in a big international science laboratory. They were invited to give a short debriefing during a panel discussion at an ILC symposium held on 10 September in Oshu city, where both girls said that they thought particle scientists are 'cool'!

Sato has always loved science and she is determined to become a researcher at the ILC. Sugawara met many people in Geneva who greeted her in Japanese, and she felt very happy about it. "I want to study English harder," she said, "to make foreign people comfortable if the ILC is being built in my neighborhood."

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誘致を利用者へＰＲ－ノ関駅に看板

ＪＲ－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?

Die Teilchenphysik ist zunehmend uneins, auf welchem Weg in Zukunft bahnbrechende Entdeckungen gelingen sollen. Gegen diesen Trend sprießen Pläne für immer neue, noch größere Beschleunigeranlagen.

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

先端加速器科学技術推進シンポジウム２０１６ in 東北「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 ?

Il faudrait donc que d'autres pays participent au financement de cette machine. Il est aussi clair que le gouvernement japonais étudiera de près les résultats qui seront obtenus au LHC en 2017 à l'énergie de 13 TeV, avant de prendre une décision en 2018. Dans l'intervalle, des groupes de travail planchent sur différents aspects du projet.

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了特任教授は「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、準備室が果たす役割の中でも、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 $e^+e^- \rightarrow HZ$ 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 $t\bar{t}$ and $t\bar{t}H$ Production and Decay at a Linear Collider

[1609.03018](#)

Physics at a Higgs Factory

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[Read in Symmetry Magazine](#)

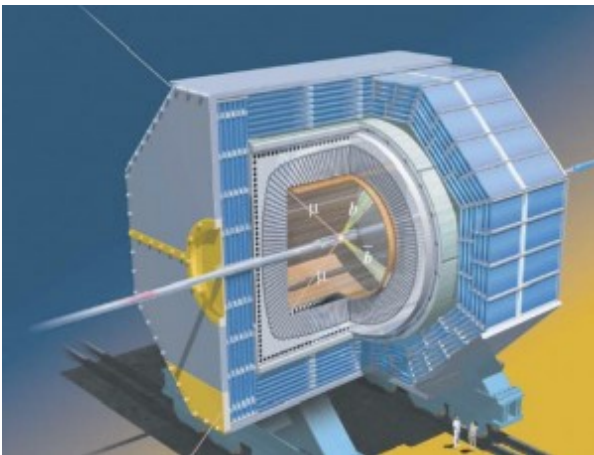


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DIRECTOR'S CORNER

Powering detector developments

Hitoshi Yamamoto | [22 September 2016](#)



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.

[AIDA-2020](#) | [DETECTOR R&D](#) | [DOE](#) | [E-JADE](#) | [FUNDING AGENCIES](#) | [JSPS](#) | [MEXT](#)

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IMAGE OF THE WEEK

Particle scientists are cool!

Image : Nobuko Kobayashi | [22 September 2016](#)



Momoyo Sugawara (left) and Kotomi Sato (right), junior high-school students from the "ILC club". Image: Nobuko Kobayashi

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