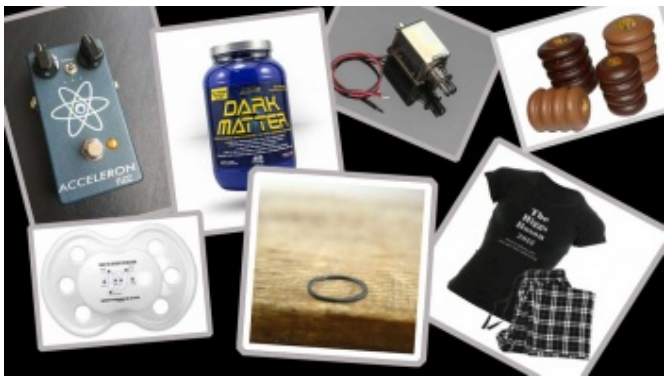
LC NEWSLINE
THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

FEATURE



The ultimate collider gift list

by Barbara Warmbein

Do you know a linear collider enthusiast and would you like to surprise him or her with a gift? Or are you a linear collider enthusiast and as such too busy to go gift shopping? Then agonise no more. We've done some extensive research and proudly present a list of some of the best linear-collider-related gifts available online…

AROUND THE WORLD

New working group toward ILC in Japan meets for the first time

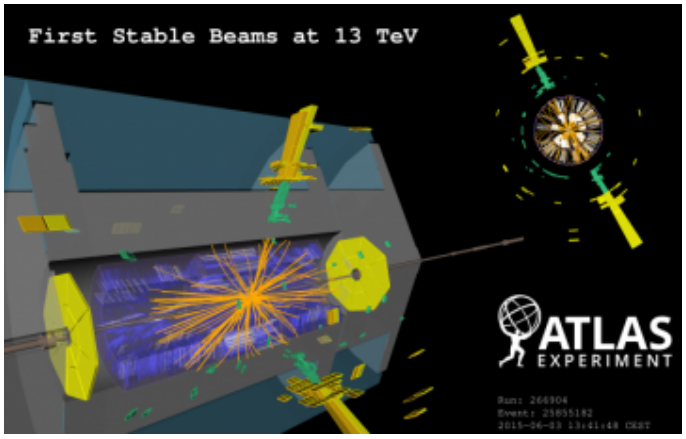
by Rika Takahashi

Getting the best people from all over the world is one of the biggest challenges to realise the International Linear Collider, the next-generation electron-positron collider. That's why there's a new working group on human resources, called into being by Japan's ILC Advisory Panel, to tackle the issue before the ILC has even been approved.

DIRECTOR'S CORNER

LHC Run-2 results to point the way

by Philip Burrows



Phil Burrows, acting Associate Director for the Compact Linear Collider Study in the Linear Collider Collaboration, says the linear collider community should be prepared for new results from the LHC over the course of the coming years, with the first to be announced next week. They will help us decide which future path we should take.

IMAGE OF THE WEEK

Quench your thirst for the ILC

by Rika Takahashi

Pin badges, flags and banners, paper folders, cakes... There are various promotional goods produced by kind supporters for the ILC. Now, we have ILC Coke!

IN THE NEWS

from *TRIUMF*
7 December 2015
Canada and Japan strengthen partnership to advance physics research
TRIUMF and KEK have shared multiple collaborative projects in these areas, with current efforts relating to T2K, the Large Hadron Collider at CERN, the proposed International Linear Collider, materials and molecular sciences, and particle physics experiments using neutrons, muons and kaons, in addition to the Belle II experiment. This new agreement will provide enhanced opportunity to better advance scientific discovery.

from *Nikkei Business*
7 December 2015
光速で衝突、宇宙の謎解明
新たな素粒子が見つかれば、宇宙誕生の謎を解明できる可能性も。日本で"究極の加速器"建設構想が浮上するが、実現には課題もある（全文を読むためには会員登録が必要です）。(Log-in required article: We might be able to unravel the mystery of the universe with the new particle to be found at the accelerator experiment. There is a plan to construct the ultimate accelerator in Japan. To realise the project, there are some issues to clear.)

from *Iwate Nippo*
7 December 2015
留学経験者らが岩手発信へ　若者の交流組織が始動
海外渡航経験がある県内の若者らによる交流活動組織「世界とのかけはしクラブ」が６日、始動した。国際リニアコライダー（ＩＬＣ）の誘致実現を見据えたグローバル人材の育成などにつなげようと、県が本年度始めた新事業。(On 6 December, a network of younger generation who have studied abroad kicked off their activity. This project is launched by Iwate prefecture eying the possibility of construction of the ILC in the region.)

from *Denki Shimbun*
03 December 2015
東北経済連合会、地元選出国会議員にILC誘致など4項目を要望
は２日、政府・省庁、自民党、新潟を含む東北７県選出の国会議員に対し、第三次安倍改造内閣に対する要望活動を行った。国際リニアコライダー（ＩＬＣ）の誘致および東北放射光施設の整備など主要４項目を盛り込んだ要望書を関係者などに手渡した。(Tohoku Ecomomic Federation lobbied government officials and diet members elected in seven prefectures on 2 December, handed out the demanding paper with four requests including the promotion of the ILC to reflecte a policy making of Prime Minister Shinzo Abe's third Cabinet.)

from *Mail on Sunday*
1 December 2015
Could mini particle smashers help find a parallel universe? Scientists reveal plans to create a powerful 'shoebox-sized Cern'
Particle accelerators weigh thousands of tonnes and span miles
New design aims to create mini accelerator using silica chip and laser light
Scaling down could make accelerators more accessible to researchers
High-powered particle accelerators could help uncover a multiverse

from *Live Science*
30 November 2015
CERN in a Shoebox? Tiny Particle Accelerators Are Coming
Scientists could soon develop particle accelerators that can fit into a shoebox, experts say.
The project, which is still in its infancy, would rely on lasers, rather than microwaves, to ramp particles to near light speed.

ANNOUNCEMENTS

NewsLine goes on holiday

LC NewsLine is taking a winter break. Our next issue will be on 14 January 2016. Happy holidays to our readers!

CALENDAR

Upcoming events

CLIC workshop 2016
CERN
18- 22 January 2016

Upcoming schools

Joint Universities Accelerator School
Archamps, Haute Savoie, France
11 January- 18 March 2016

View complete calendar

PREPRINTS

ARXIV PREPRINTS

1512.02083
Tests of Quantum Gravity induced non-locality via opto-mechanical quantum oscillators

1512.02019
Status Report of the DPHEP Collaboration: A Global Effort for Sustainable Data Preservation in High Energy Physics

1512.01879
Precision study on ZZγ production including Z-boson leptonic decays at the ILC

1512.01175
Production of Inert Scalars at the e+e− Linear Colliders

1512.00748
The Conversion of CESR to Operate as the Test Accelerator, CesrTA, Part 3: Electron Cloud Diagnostics

1511.09344
Precise predictions for Higgs-boson production in association with top quarks

1511.07913
R&D on GEM Detectors for Forward Tracking at a Future Electron-Ion Collider

1511.07853
Prospects for Higgs physics at energies up to 100 TeV

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The ultimate collider gift list

Barbara Warmbein | 10 December 2015

Do you know a linear collider enthusiast and would you like to surprise him or her with a gift? Or are you a linear collider enthusiast and as such too busy to go gift shopping? Then agonise no more. We've done some extensive research and proudly present a list of some of the best linear-collider-related gifts available online…

The linear colliders ILC and CLIC will need vast numbers of components to make up the linear accelerators, the detectors, the klystrons, RF system etc etc. Now we are not suggesting you give your loved one a piece of superconducting cable (even though some might even like it). Instead, we hunted the web for linear-collider terms and what the google shopping function offered us.

Did you know, for example, that klystrons are not only colossal power amplifiers for efficient particle acceleration but also a heavy metal band? According to their website, they are "a Melodic Metal band with influences ranging from Oldschool Thrash and Classic Rock, all the way through Grunge, Punk and Rock n Roll….". Sound samples are available online. Or have you heard of DJ Klystron, a DJ with a PhD in physics – check out his soundcloud. Could there be a more appropriate name for somebody making beats to make people move than the accelerator's heartbeat itself? Book him as a surprise for your children's next electro party.

…for "bity and snarly vintage and compressed tones"… Image: resonant electronic design

The real hardware klystron aficionados will enjoy getting their hands on this first edition of "Klystron Tubes" by A.E. Harrison. Both book and jacket are in very good condition, apparently.

The search for "accelerator" yielded results for friends and loved ones with an affinity for making (loud) music. Take this "acceleron" distortion pedal for electric guitars, for example. Apparently it gives "those bity and snarly vintage and compressed tones without the muddiness". Or do you think they would rather enjoy unwrapping a micro hadron collider, available here? After all it "scientifically smashes two electron waves into oblivion at the speed of light, producing an audio frequency Higgs-Boson particle beam of harmonius (sic) analog physics equilibrium. Well… not really…"


Niobium nose rings – set a new trend. Image: mysticmoonshop.com

What about niobium, the stuff that the ILC's cavities will be made of? It's not only great for boosting electrons and positrons, it also makes decent jewellery, including for noses.

That's acceleration for the ILC, so what about CLIC? Well, drive beam fans and DIY accelerator craftsmen will almost certainly enjoy a gift of a "toolbox classic, easily and accurately tightening (or loosening) nuts and bolts in a variety of applications" – a drive beam wrench…

Electrons are of course an endless source of shopping opportunities on the web, some of them with rather shaky scientific footing. The most appropriate and simultaneously rather cool item on our search for "e^-" is this human acceleration device… In contrast to electrons, positrons are reserved for climbers, however.

Having covered the main parts of the accelerators we're now getting closer to the interaction point. And what would create more harmony under the ILD-SiD Christmas trees than this push-pull solenoid (large)?!

A large push-pull solenoid. A bargain at only $14,95! Image: adafruit.com

Your detector developer is less of an engineer and more of a manager? Then they might prefer this more outdoorsy push-pull item.

We've covered the accelerators and the detectors. What about all those pencil-sharpening, blackboard-filling physics people out in the labs and universities? There's a whole world of physics-related gifts out there, ranging from seriously thoughtful and intellectual to pun-filled nerdish. And there's art, too. For example, one gift that is sure to keep on giving is this portrait of Peter Higgs – as a Spotted Owl. These owls are also available as Stephen Hawking, William Shakespeare, Charles Darwin and many more…

If you work in physics, you're probably no stranger to motto t-shirts. But have you tried motto pyjamas?

Motto pyjamas – all the rage in 2016? Image: cafe press

Or, for the teenagers in your family, this motto tank top that combines pop culture with science might go down well. Mainstream with a twist!

Oh, you teenager isn't mainstream? How about some dark matter jewellery then?

Your teenager is male? Much so? No problem! Get him a dose of dark matter post-work muscle-growth accelerator

Your target group is even younger than teenage? Well, here's the Standard Model for dummies – literally.

The Standard Model for dummies. Image: zazzle.com

And if you're not that into jokes but are just looking for a good read over the holidays we might have manage to find just the thing for you, too. Written by Michael Riordan, professor of the history of physics and technology, Lillian Hoddeson, professor of the history of science and

Adrienne Kolb, former Fermilab archivist, this book tells the story of the rise and fall of the Superconducting Supercollider.

Of course there's also KEK's range of merchandise related to particle physics in general and the ILC in particular.

Baumkuchen, spit cake, is not only a German cake speciality but also reminiscent of an accelerating cavity. Ask your local bakery for a sample! (This particular image is (C) www.konditorei-peters.de)

Did we forget or overlook anything? Let us know or send us your own gift suggestions by commenting on this article or sending an email to communicators@linearcollider.org !

DISCLAIMER

For some of the items highlighted in this list, other suppliers are available. The article should not be understood as an endorsement of any of the items.

The items were found typing search terms into google's "shopping" function and selected randomly.

Dark matter may be lurking in your abs… Image: MHP

XMAS

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AROUND THE WORLD

New working group toward ILC in Japan meets for the first time

Rika Takahashi | 10 December 2015

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On 18 November, the first meeting of the new working group under the ILC Advisory Panel, a committee charged by Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) was held in Tokyo. This new working group investigates issues on necessary human resources and their training and has been set up following the recommendation in the panel's summary report published in June.

Headed by Takashi Nakano, Director of the Research Center for Nuclear Physics, Osaka University, the working group consists of 11 members of researchers and experts from major universities and industry. One of the focuses of discussion is to secure the human resources necessary to construct and operate if the project receives the green light.

In previous discussions among the Advisory Panel, acquiring human resources for ILC realisation was recognised as an important issue, since for the ILC, a massive number of components will need to be produced, and reliable supervision at the construction site is required. Also, human resources with special administrative skills are necessary to handle complicated issues regarding a large-scale international collaboration.

In the meeting, Akira Yamamoto, Asian Regional Director of Linear Collider Collaboration from the KEK laboratory gave a report on the global studies and investigations made for the ILC's.

In the meeting, Akira Yamamoto, Asian Regional Director of Linear Collider Collaboration (LCC) and Head of the Linear Collider Project Office at KEK laboratory, gave a report. Because he is wearing two hats, he reported from two different standpoints; one from the standpoint of the LCC about the global studies made for the ILC's Technical Design Report issued in 2013 and another as a member of KEK's project team about the investigation made for KEK's plan to prepare for the ILC.

He is also a member of this new working group. Yamamoto summarised the estimates of required human resources in the each phase of preparation, construction, and operation, and he reported that about 1100 persons/year on average for the ILC laboratory staff will be needed to cover all these categories. The panel argues that it is critical to verify the prospect of securing the capable specialists and experts globally – how many and when they would participate in the project?

"I reported an overview of the ILC human resource plan in the ILC Technical Design Report and a necessary human resource and training plan, in the ILC preparation phase, studied by KEK since early this year. I have been very pleased with forward-looking

discussions during the working group meeting," said Yamamoto. The slides of the first meeting are available at MEXT's web page.

The working group will have a series of the meetings, to verify the issues to secure existing human resources and foster future man powers. They are planning to conduct research on other large-scale scientific programs, domestic and global, such as the Large Hadron Collider at CERN and Spring-8, the light source facility in Japan. The working group plans to issue the report in spring.

Excerpt from Yamamoto's report presented at the working group meeting. Source: MEXT homepage (http://www.mext.go.jp/)

JAPAN | MEXT | TECHNICAL DESIGN REPORT

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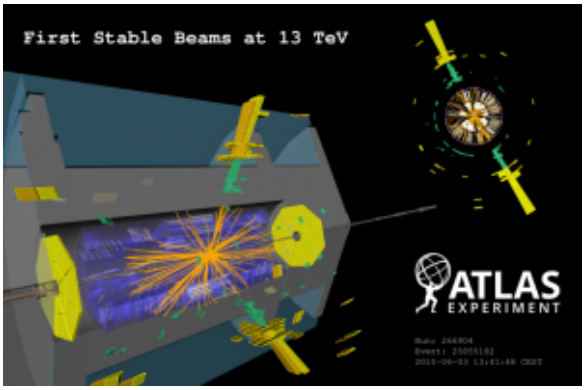
DIRECTOR'S CORNER

LHC Run-2 results to point the way

Philip Burrows | 10 December 2015

Time passes, it seems, increasingly quickly and it's now more than a month since the international Linear Collider Workshop, LCWS2015, took place in Whistler, British Columbia. This marked the latest milestone in our global community's preparations for a next-generation high-energy linear electron-positron collider to explore (to paraphrase Donald Rumsfeld) the 'known knowns', namely the physics of the Higgs boson and the top quark, as well as to prepare for the 'known unknowns', i.e. the beyond-Standard Model physics that must be there, perhaps manifesting Nature's implementation of Supersymmetry or some other clever human idea, and also to be prepared for the 'unknown unknowns', i.e. something totally weird and unexpected, which would potentially cause a paradigm shift in our understanding of subatomic matter and the forces of Nature.



The LHC has collected a lot of data at the record energy of 13 TeV since its restart earlier this year. Image: ATLAS Experiment © 2015 CERN

In a similar vein another significant milestone was reached at CERN in the past month with the completion of the 2015 proton-proton run at the Large Hadron Collider – the heavy-ion run is still in full swing as I write – at the new maximum collision energy of 13 TeV. I am privileged to serve on CERN's Large Hadron Collider Committee ('LHCC') and to have the opportunity to help monitor and guide the LHC's experimental programme. After the two-year shutdown for consolidation of the LHC accelerator complex and increase of the beam energy by almost a factor of two, 2015 was always going to be a tough year, requiring careful and dedicated re-starting and re-commissioning of the upgraded machine. Nevertheless, at the end of the proton-proton run period 3-4 fb-1 of luminosity has been recorded by ATLAS and CMS. Combined with the beam energy increase this represents a data sample that provides a significant advance in statistical power, and mass reach, for direct new-particle searches. This will already take us well beyond the results obtained with the Run-1 data sample that was collected between 2009 and 2012. A special seminar is scheduled at CERN for 15 December at which first results from the complete 2015 LHC data sample will be presented by the experimental collaborations. Moreover, once the LHC gets back into its stride after the Year End Technical Stop (or winter shutdown), and with further hard work by the machine group to increase the luminosity, we can look forward to significantly more data in 2016 and beyond.

So by any measure the next few years will be exciting for the global particle physics community, and especially so for the linear collider community, as the LHC results will help point us towards the optimal future pathway. The ILC already has a guaranteed, gold-plated physics capability whose crown jewels are precision measurements of the Higgs boson and the top-quark, not to mention a wealth of other precision measurements and searches, to be realised in a multi-decade programme that would cover energies up to around 1 TeV. CLIC is targeting the highest energies, up to around 3 TeV, that we can currently imagine realising with an electron-positron collider based on state-of-the-art accelerating technology. If new heavy particles at the TeV mass scale are revealed by the LHC over the next few years then CLIC could well be the best way to produce them copiously and study them incisively in a clean experimental environment. The next CLIC project milestone will be the 2016 CLIC workshop, at CERN, 18 to 22 January, where we will review the machine, detector and physics studies status and plans, with a view to the next update of the European particle physics strategy around 2019. Everyone is warmly invited to participate.

Finally, in the linear collider community we should keep in mind the well-known motto of the scouts: ‘be prepared!’ … for what the LHC will soon tell us.

13 TEV | CERN | CLIC | ILC | LCWS15 | LHC

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IMAGE OF THE WEEK

Quench your thirst for the ILC

Rika Takahashi | 10 December 2015

Image: Nobuko Kobayashi

Pin badges, flags and banners, paper folders, cakes… There are various promotional goods produced by kind supporters for the ILC. Now, we have ILC Coke!

The Iwate Prefecture International Linear Collider Promotion Council produced miniature Coca-Cola cans with an ILC logo to bring understanding and empathy for the ILC project. An official from the Council said that there are different versions of design, but unfortunately, they are not for sale.