

LC NEWSLINE

THE NEWSLETTER OF THE LINEAR COLLIDER COMMUNITY

FEATURE

Press release: Colliders colliding

ILC and CLIC unite in the Linear Collider Collaboration, a new global organisation to advance the global development work for next-generation particle collider



Vancouver, 21 February 2013. The two most mature future particle physics projects, the International Linear Collider (ILC) and the Compact Linear Collider study (CLIC), have formed an official organisational partnership today. As the newly founded Linear Collider Collaboration, they will coordinate and advance the global development work for the linear collider, a global project to complement the Large Hadron Collider (LHC) at CERN and ultimately understand the deepest secrets of the universe.

FEATURE

Global Design Efficiency: the story of a group revolution

by Barbara Warmbein



It all started in 2004... or so. *LC NewsLine* recaps the important milestones in the Global Design Effort history, and present and former honourable witnesses remember and send wishes to Barry Barish and Sake Yamada.

DIRECTOR'S CORNER

A time of transition, or When men and mountains meet

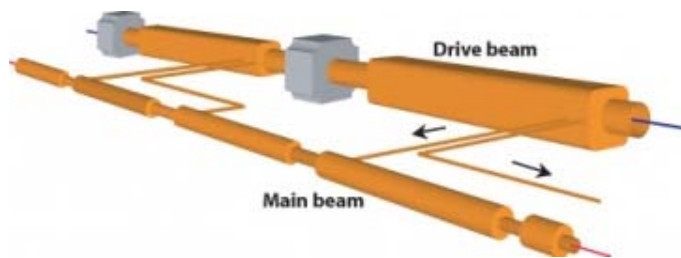
by Barry Barish and Lyn Evans

Today represents a crossroads in the global efforts towards a linear collider. We are officially making the transition from the International Linear Collider Steering Committee and Global Design Efforts to the new Linear Collider Board and Linear Collider Collaboration that will coordinate the next phase of the global R&D towards a high-energy electron-positron collider to complement the LHC. GDE Director Barry Barish and LCC Director Lyn Evans share their vision in a joint Director's Corner.



Drive Beam

by Daisy Yuhas



Today is the day the two linear collider projects ILC and CLIC officially unite in the Linear Collider Collaboration. Look forward to more CLIC-related in content in *LC NewsLine* in the future and get into the swing with this LCpedia entry on the CLIC acceleration technology.

Andy White and Marcel Stanitzki new SiD spokesmen

by Barbara Warmbein

There is a change at the helm of SiD, one of the two detector concepts for the ILC. After John Jaros and Harry Weerts have pushed SiD the LOI, the validation of SiD as one of two ILC detector concepts and collaboration in the CLIC CDR, the time is right for two new spokesmen to take over. These are Andy White and Marcel Stanitzki, whose role now is to strengthen the SiD detector concept and attract new collaborators from all the regions and and continue to develop and improve the SiD concept.



IN THE NEWS

from *Saga Shimbun*

20 February 2013

誘致、唐津に協議会 九州の自治体初

国際リニアコライダーの誘致を目指す産学官の連携組織「唐津推進協議会」が 日、発足した。佐賀、福岡両県の脊振山地と岩手県の北上山地との間で国内候補地選びが本格化する中、九州の自治体で初めて推進組織を設立、「誘致に向け、唐津市が先頭に立ちたい」と意欲を見せた。(On 19 February, Karatsu city announced the establishment of the association to promote the activities toward invitation of the ILC to Kyushu area. This is the first association established by local government in Kyushu area)

from *CERN Courier*

20 February 2013

Linear-collider technologies for all

One highlight in Anaheim was a talk on the physics of the LC by Hitoshi Murayama of the Kavli Institute for Mathematics and Physics of the Universe (IPMU) and future deputy-director for the LCC. He addressed the broader IEEE audience, reviewing how a “Higgs factory” (a 250 GeV machine) as the first phase of the ILC could elucidate the nature of the Higgs particle – complementary to the LHC.

from *Элементы*

19 February 2012

Физики обсуждают варианты «хиггсовской фабрики»

изическое сообщество уже давно ориентируется на то, что следующим после LHC универсальным ускорителем будет линейный электрон-позитронный коллайдер. Разработка его идет полным ходом уже второе десятилетие, и состояние работ сейчас примерно соответствует работам над LHC в начале 90-х годов. Сейчас имеются две конкурирующие схемы — ILC и CLIC, — рассчитанные на полную энергию столкновений 500 ГэВ (с возможностью дальнейшего повышения энергии). Проект ILC уже находится в стадии подробного технического отчета (technical design report), его публикация ожидается в середине 2013 года) и опережает пока проект CLIC. Однако на днях будет объявлено об объединении работ над этими проектами в рамках единой коллаборации. (Rough translation)

from *Österreich Journal*

18 February 2013

Neueste Teilchendetektoren im Blick

300 Teilnehmer bei weltweit größter Konferenz über Teilchendetektoren in Wien

from *Exchange Magazine*

18 February 2013

TRIUMF HOSTS LAUNCH OF NEW GLOBAL TEAM FOR LINEAR COLLIDER

Vancouver – Canada is famous for being a peacemaker, a negotiator, and a broker of transition and change that creates a brighter future for everyone. On February 21, TRIUMF will do its part in fulfilling this role as it plays host to a meeting of the leaders of the major high-energy physics laboratories around the world.

from *Kahoku Shinpo*

16 February 2013

計画国際推進組織測定器部門 責任者に東北大・山本氏

「国際リニアコライダー」計画で、日に発足する国際推進組織の測定器部門の責任者に、東北大大学院理学研究科の山本均教授が就くことが、日に分かった。(Hitoshi Yamamoto, professor at Tohoku University was announced to be an associate director in charge of physics and detector study for the new linear collider organization)

from *Wales Online*

15 February 2013

Welsh scientist behind CERN Large Hadron Collider announces new project

Cern experts say the new linear collider will be a “scalpel” examining newly discovered particles chipped off atoms by the LHC, which was launched with great fanfare by Dr Evans in September 2008.

from *Kahoku Shinpo*

15 February 2013

一関市、誘致へ 万円 年度当初予算案

岩手県一関市は、日に、年度当初予算案を発表した。岩手県などが同市を含む県南部・北上山地への誘致を目指す超大型加速器「国際リニアコライダー」の実現に向けた「一関市学術研究都市構想推進事業 仮称」に、万円を盛り込んだ。(Ichinoseki-city announced their FY2013 budget on 14 February . The city allocated 22.5 million yen to the project to realize the ILC in the Tohoku area)

from *Saga Shimbun*

15 February 2013

「九州推進会議」が発足 誘致で

「国際リニアコライダー」建設計画の実現に向け、九州・山口地域の産学官でつくる「アジア九州推進会議」が、日に、発足した。地域の力を結集し、誘致活動を展開する。(An association aiming to realize the construction of the ILC has established on 14 February by the collaboration between industry, educational institutions and the administration of prefectures in Kyushu island and Yamaguchi.)

from *CERN*

14 February 2013

First three-year LHC running period reaches a conclusion

Over the coming months major consolidation and maintenance work will be carried out across the whole of CERN’s accelerator chain. The LHC will be readied for higher energy running, and the experiments will undergo essential maintenance. LHC running is scheduled to resume in 2015, with the rest of the CERN complex starting up again in the second half of 2014.

from *Iwate Broadcasting Co.*

12 February 2012

県の新年度当初予算発表「復興加速予算」

県の新年度当初予算案がきょう発表されました。過去最大規模となった今年度の当初予算をさらに上回る「復興加速予算」と名づけられています。また復興の先を見据えた事業にも経費を確保し、国際リニアコライダーの誘致に関連して、およそ万円が計上されました。(Iwate prefecture announced FY2013 budget today, calling it “Budget to accelerate the recovery, which is bigger than ever. Prefecture allocated 34 million yen, for the activity to invite ILC to the area)

from *InterAction Collaboration*

11 February 2013

Help choose the next iconic “Big Science” image

Last September, hundreds of amateur and professional photographers streamed into particle physics laboratories around the world to produce thousands of photographs of state-of-the-art equipment, laboratories and people, in all their beauty and complexity. Now, the citizens of the world are invited to vote for their three favorites as part of the “people’s choice” global photowalk competition.

CALENDAR

Upcoming events

[Les Rencontres de Physique de la Vallée d'Aoste \(La Thuile 2013\)](#)

La Thuile, Italy

24 February- 04 March 2013

[Calorimetry for the High Energy Frontier \(CHEF2013\)](#)

Paris, France

22- 25 April 2013

Upcoming schools

[Joint Universities Accelerator School \(JUAS 2013\)](#)

Archamps, France

07 January- 15 March 2013

[CERN - Latin-American School of High-Energy Physics](#)

Arequipa, Peru

06- 19 March 2013

[Excellence in Detectors and Instrumentation Technologies \(EDIT 2013\)](#)

KEK, Japan

12- 22 March 2013

[View complete calendar](#)

PREPRINTS

arXiv preprints

[1302.2894](#)

Effects of Family Nonuniversal Z' Boson on Leptonic Decays of Higgs and Weak Bosons

[1302.3318](#)

Report of the ICFA Beam Dynamics Workshop 'Accelerators for a Higgs Factory: Linear vs. Circular' (HF2012)

[1302.3379](#)

The DPHEP Study Group: Data Preservation in High Energy Physics

[1302.3427](#)

Higgs Bosons in supersymmetric U(1)' models with CP Violation

ANNOUNCEMENTS

Welcome to the first issue of LC NewsLine!

We will cover news and developments from both the ILC and CLIC, continue to biweekly update you on progress in detector R&D and provide you with views from the management in Director's Corners. Please share this information with your colleagues and friends! Check also the [new Linear Collider website](#).

International Conference on RF Superconductivity

The 16th International Conference on RF Superconductivity, SRF 2013, will take place on 22-27 September 2013 at the Cité Internationale Universitaire, Paris, France. Special tutorials will be held on 19-21 September 2013 in GANIL, Caen. You can now register online and submit your abstract at www.srf2013.fr.

Sincerely,

Claire Antoine, Chair, and Sebastien Bousson, Co-Chair of the [Local Organising Committee](#)

FEATURE

Press release: Colliders colliding

ILC and CLIC unite in the Linear Collider Collaboration, a new global organisation to advance the global development work for next-generation particle collider

[21 February 2013](#)



LINEAR COLLIDER COLLABORATION

Vancouver, 21 February 2013. The two most mature future particle physics projects, the International Linear Collider (ILC) and the Compact Linear Collider study (CLIC), have formed an official organisational partnership today. As the newly founded Linear Collider Collaboration, they will coordinate and advance the global development work for the linear collider, a global project to complement the Large Hadron Collider (LHC) at CERN and ultimately understand the deepest secrets of the universe. The Linear Collider Collaboration is headed by Lyn Evans, former Project Manager of CERN's Large Hadron Collider (LHC). Hitoshi Murayama, Director of the Kavli Institute for the Physics and Mathematics of the Universe, will serve as a deputy director.

The Linear Collider Board, headed by the University of Tokyo's Sachio Komamiya, is a new oversight committee for the Linear Collider Collaboration that will take office at the same time. The oversight board was appointed by the International Committee for Future Accelerators (ICFA), which is currently chaired by Pier Oddone, Director of Fermilab, US.

"It is my great pleasure to see the worldwide efforts to design and build the next-generation linear collider take their next step. I look forward to working with Lyn and his team," said ICFA chair Pier Oddone.

"Now that the LHC has delivered its first and exciting discovery I am eager to help the next project on its way," said Linear Collider Director Lyn Evans. *"I am an accelerator builder, and with the strong support the ILC receives from Japan, the LCC may be getting the tunneling machines out soon for a Higgs factory in Japan while at the same time pushing frontiers in CLIC technology."*

"The two projects, ILC and CLIC, have similar goals, but use very different technologies and are at different stages of maturity. I look forward to seeing progress in both projects as chair of the Linear Collider Board," said Sachio Komamiya.

The Linear Collider Collaboration has three main sections, reflecting the three areas of research that will continue to be conducted. The International Linear Collider section will be led by Mike Harrison (Brookhaven National Lab, US), the Compact Linear Collider section will be led by Steinar Stapnes (CERN), and the section for Physics and Detectors will be led by Hitoshi Yamamoto (Tohoku University). For the ILC, which will publish its *Technical Design Report* in June 2013, the main focus is on preparing it for possible construction while at the same time further advancing acceleration technologies and design optimisation. For CLIC, research into the novel drive beam acceleration concept will continue to proceed. For Physics and Detectors, research and development of novel detector technologies and concepts will continue at full power, fully exploiting the synergies that exist between ILC and CLIC detector requirements.

The ILC's Global Design Effort and its supervisory organisation, the ILC Steering committee, officially handed over their duty to LCC and LCB, but they will continue to work together until the official completion of the *Technical Design Report* for the ILC in June 2013.

The Linear Collider Board and new Directorate met for the first time on 21 February at Canada's national laboratory for particle and nuclear physics TRIUMF. The press conference will be webcast at <http://mediasitemob1.mediagroup.ubc.ca/Mediasite/Play/4927082a86c441c3bbf1ee94611b0c131d> . Journalists will have the opportunity to ask questions via the online webcast using a standard web browser.

After the discovery of a new particle at the Large Hadron Collider at CERN, the case for a linear collider has become even more compelling. The new particle, which was found to have a mass of 126 GeV, needs to be studied in great detail to precisely determine its properties and confirm (or not) that it is the final missing piece of the Standard Model of Particle Physics, the Higgs particle. The LHC will only be able to do these precision studies up to a certain point, while a linear collider, with its 'cleaner' collisions between electrons and their antiparticles, positrons, will be able to probe deeply into the new particle, and a range of other phenomena that physics still expect to be discovered at the LHC.

The International Linear Collider is currently the most advanced linear collider project, both in terms of advanced and tested acceleration technology as well as from an organisational point of view. Truly global from the start with some 1000 people from around the world working on its design, it can be built in stages – first, at half its design energy, as a so-called Higgs factory for the precision studies of the new particle, second, at its design energy of 500 GeV, and third, at double this energy, which opens further possibilities for as yet undiscovered physics phenomena. Japan is signaling interest to host the ILC.

About the Linear Collider Collaboration: The ILC and CLIC are potential next-generation particle colliders that would complement the Large Hadron Collider LHC at CERN. The Linear Collider Collaboration is the organisation that brings the two projects together to coordinate the research and development work that is being done for accelerators and detectors around the world. Although there is not yet a clear signal to launch the construction of a linear collider, there is consensus in the scientific community that the results from the LHC should be complemented by a collider that can study the discoveries in greater detail by producing different kinds of collisions.

Both projects will continue to exist and carry on their R&D activities, but with even more synergy between areas common to both. These include the detectors, the planning of the infrastructure, civil engineering aspects and more. The projects are at different stages of maturity: while CLIC published *its Conceptual Design Report* in 2012 and is scheduled to complete the *Technical Design Report*, which demonstrates feasibility for construction, in a couple of years, the ILC has completed the draft of its *Technical Design Report* in 2012 and will, after a series of reviews, publish the final version including a new figure for the projected cost, in June 2013. With the finalisation of the *Technical Design Report*, the ILC's design team, the Global Design Effort or GDE, headed by Barry Barish, formally completes its mandate, which is one of the reasons for the establishment of the new Linear Collider Collaboration.

[CLIC](#) | [DIRECTORATE](#) | [ICFA](#) | [ILC](#) | [LINEAR COLLIDER BOARD](#) | [LINEAR COLLIDER COLLABORATION](#)

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FEATURE

Global Design Efficiency – the story of a group revolution

Barbara Warmbein | [21 February 2013](#)



Snowmass 2005 – where it all started.

Some T-shirts lose their lives in the wash, but their memories live on. At a meeting in Snowmass, US, in August 2005, Norman Graf was seen wearing a simple white t-shirt asking “got ilc?” (Not yet, Norm) And Nick Walker sported a yellow shirt that said “[Summer In Snowmass – Some Are Not.](#)”. Those who were witnessed the birth of the Global Design Effort or GDE, the team (counting precisely 49 members at the time) that took several existing plans for future accelerators and a [decision on its technology](#)) and turned them into one sound, streamlined and strawman-baselined design for the International Linear Collider. With the completion of *Technical Design Report* (TDR) the GDE has ticked its final to-do box, and when the final TDR is handed over to the International Committee for Future Accelerators (ICFA) in June, there will be no more GDE.

The Global Design Effort would never have come into existence, however, had there not been a panel, devised by ICFA, to decide which acceleration technology should be used for the next-generation collider. It was a big decision between the so-called cold technology, based on superconducting radiofrequency, and warm X-band technology. Each technology had its own advantages, and for each of them, teams of talented and dedicated scientists and engineers had spent many years of R&D. But planning of the next-generation machine had reached a stage at which it would have been too costly and time-consuming to develop both technologies towards construction. [A decision was needed](#), and a panel to take this decision. The chair? Barry Barish.

“It is hard to recall how many meetings Barry and I have attended together trying to move the cause of the ILC forward,” recalls former DESY Director and ICFA chair Albrecht Wagner. *“I first met him well before the GDE, the ILC Steering Committee (ILCSC), ICFA and before Barry took the helm of the GDE, during a meeting at Snowmass where I was given by him a cross examination on the TESLA project. Barry always impressed me by his calm, attentive way to listen, to speak, and to ask pertinent questions. He has his own skillful way of bringing divergent ideas together, such that everybody could subscribe to the result. This was especially true when he led the International Technology Recommendation Panel. It had the difficult, yet very clear goal to recommend one and only one technology. He and his group mastered this challenge brilliantly, such that all who were concerned accepted the ‘verdict’, especially those who for many years had put tremendous effort into advancing the technology which finally was not recommended.*

The moment of the announcement of this ‘verdict’ is burnt deeply into my memory. Barry had promised the three lab directors mostly concerned, Jonathan Dorfan, Yoji Tostsuka and me, to inform them of the recommendation one day before the public announcement at the 2004 ICHEP conference in Beijing. He told me he would call at 7:00 am. I was wide awake much before that time and nervously running around in my hotel room. At 7:00 sharp the phone rang, it was Barry. And in his calm voice he said: ‘To cut a long story short: It’s cold’. What he said afterwards was lost in emotions.”



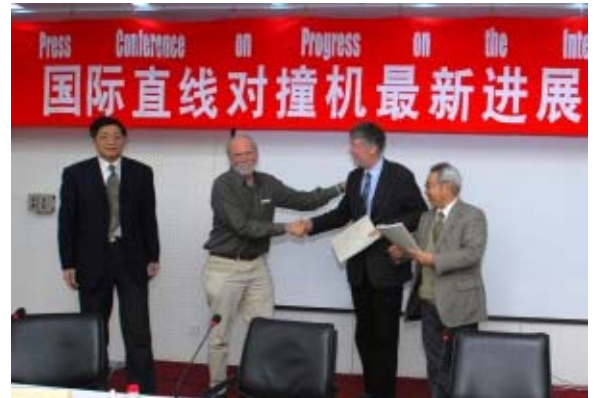
Norman Graf (SLAC), wearing a famous t-shirt during Snowmass workshop in August 2005. Image: ILC

Won Namkung from PAL, POSTECH, Korea, who used to be a member of the ILCSC and chaired the ALCSC as well, also has strong and fond memories of the ITRP process: *“Barry has a strong magnetic field attracting everyone’s mind. Wearing blue jeans with grey hair, he looks like an old grandpa, but his leadership at ITRP was beyond anybody’s expectation, quickly reaching a consensus on a superconducting acceleration technology for ILC. I hosted the last meeting of ITRP in 2004 in Pohang, Korea. For RDR and TDR tasks, his accomplishments mark great milestones for the future of high-energy physics research. We are all in debt for his remarkable and excellent accomplishments, and we will remember him for a long time.*

So the next step – the formation of the GDE and the nomination of Barry as its leader – seemed only natural. On 8 June 2005, Barry wrote his [first Director’s Corner](#) for *ILC NewsLine*, the first of roughly a Corner a week over a period of almost eight years. Surveys say that his Corners are the most read story in the newsletter, and they are known to trigger quite a number of discussions!

Corner writing notwithstanding, Barry and his team, which he managed to make larger by the month, cracked on and less than two years after its formation the GDE published the [Reference Design Report](#) for the ILC, the blueprint and first detailed technical description of the future machine. It also gave the very first cost estimate for the ILC, in ILC units, which raised a lot of attention, not always of the wanted kind.

But what is an accelerator without its detectors? Even if the originally foreseen two interaction points were reduced to one for cost-cutting reasons, several detector concepts were vying for their space in the electron-positron collisions. The mainly Japanese and the mainly European, but otherwise very similar “Large Detector Concept” and “Global Large Detector” decided to merge to form the “International Large Detector” in 2007, and together with the Silicon Detector (SiD) and the “4th concept” detector they submitted Letters of Intent (LOIs) that needed validation through the detector review panel. ILD and SiD made it through and invented a number of new concepts along the way – push-pull, moving detectors on platform, power pulsing, high-granularity particle flow, you name it. The ILC’s Research Director Sakue Yamada put all concepts, letters, ideas and R&D efforts through their paces. And François Richard, former co-chair of the Worldwide Study and regional detector contact for Europe, recalls an episode with Barry: *“At DESY at LCWS2007 I had the pleasure to present in the tent the future organisation of detectors in view of the LOIs. I remember, after the public discussion, asking Barry whether he would accept to chair our organisation. He politely declined, saying that our organisations were too complex to be handled... It was said in a quiet tone but leaving no room for further arguments.”*



Barry Barish handing over the Reference Design Report to ICFA (Albrecht Wagner) and ILCSC (Shin-ichi Kurokawa), with Hesheng Chen looking on. Image: IHEP



Purpose of these statements:

The CLIC and ILC Collaborations agree to work together, within the framework of the CLIC / ILC Collaboration, to outline comparative statements to be used in presenting their respective projects. The Collaborations members agree to limit statements made about each other’s projects to specifically agreed upon statements such as those listed below:

• **Project design**

The CLIC and ILC projects both plan to release design documents in the coming years. The CLIC Conceptual Design Report is to be published in 2010. If the CLIC technology is demonstrated to be feasible, a CLIC Technical Design will then be launched for publication in a CLIC TDR by 2015. The ILC TDR will be published in 2012. The design reports are intended to summarize the R&D and project planning at that time and will serve as indicators of project readiness. Both TDRs are intended to be submitted to governments and associated funding agencies in order to seek project approval.

• **Test facilities and system tests**

The CLIC and ILC projects both have test facilities either in operation or under construction for the purpose of demonstrating the performance of key technical components or to allow system engineering and industrialization. For each project, R&D priorities and schedules have been defined and it is anticipated that milestones and progress will be reviewed and reported on by members of the community. The IHEP project, with the same technical basis as the ILC, although at a lower accelerating gradient, and 7% of the energy of one of the ILC linacs, is a large-scale system test and demonstration of the industrialization of the ILC linear technology. The CEBAF based CLIC project is a demonstration of the CLIC two beam technology, although at a lower beam power.

• **Technology maturity and risk**

The collaborations agree that the ILC technology is presently more mature and less risky than that of CLIC. There are plans to demonstrate, by 2010, the feasibility of CLIC technology and to reduce the associated risk in the future. The ILC collaboration will focus on consolidation of the technology for global mass production. Both collaborations consider it essential to continue to develop both technologies for the foreseeable future.

• **Costing**

Project planners from the CLIC and ILC projects are developing common methodologies and tools with the intention of enabling the development of similarly structured project planning and costing documents for each of the two projects. The two collaborations agree to make no public statements about the comparative cost numbers of the two machines until these project planning and costing documents are complete.

Barry C. Barish

Barry C. Barish
ILC-GDE Director

J-P. Delahaye

J-P. Delahaye
CLIC Study Leader

The CLIC/ILC statement, a forerunner to the Linear Collider Collaboration.

Times weren’t always rosy for the researchers and developers of the ILC, the next revolution in particle physics. December 2007 has gone down in the history of the GDE as [Black December](#). US federal budget for fiscal year 2008 eliminated \$90 million in funding for high-energy physics in the US. Included in the budget cuts was funding for US R&D on the International Linear Collider as well as on superconducting radiofrequency technology. In the UK, particle physicists and astronomers also faced a 25% cut in research spending.

With crucial projects and, more importantly, people, suddenly withdrawn, the remaining team had to make some tough decisions. Individual R&D projects were put into different priority categories, they were globally reorganised, and due to some creative accounting the odd key scientist who would otherwise have had to join other groups could be kept on the project. The fact that physicists are driven by determination and conviction helped the ILC through these tough times, but the mood was low. Efforts to lower the price tag of the machine became even more important than before.

It was also clear that potential future funders of a linear collider wanted to see collaboration between the friendly competitors CLIC and ILC. There are many common points and challenges to the two projects, so in November 2008, the ILC-CLIC collaboration was formalised by a [joint statement](#) of GDE Director Barry Barish and the CLIC study leader, Jean-Pierre Delahaye at the time. Leading CLIC scientists became part of the Executive Board, and in return the ILC sent representatives to the CLIC Collaboration Board, working groups were formed and the two projects became a happy particle physics patchwork family.

There will always be reports, and the two most important ones along the way to the ILC *Technical Design Report* was the [Strawman Baseline Proposal](#), published in 2009, and the [Interim Report](#), published in 2011.

Then something not completely unexpected but nevertheless overwhelming happened in 2012. On 4 July, CERN announced [the discovery of a Higgs-like boson](#) at the Large Hadron Collider, and with this, things really picked up. Proposals for a three-stage ILC including a Higgs factory started to make the rounds, and messages from Japan, whose particle physics community had already voiced great support for building the ILC there, are becoming increasingly official. So when will the ILC community be wearing t-shirts that can answer the 'got ilc?' question with a "yes!" printed on the back...?

Memories, and thank-you messages to Barry Barish and Sakue Yamada

Hesheng Chen (former ACFA Chair)

The GDE and RD groups made excellent works for the design and R&D of the ILC machine and detector. The ILC Technical Design Report (TDR) will be ready soon and make an epoch of the ILC. Thanks Barry and Sakue. The discovery of the Higgs-like particle at the LHC experiments calls for an ILC.

Gao Jie (chair of the Asian Linear Collider Steering Committee)

For me, ILC Newslines has been one of my good friends during ILC GDE era, both providing helps and most importantly providing synchronised encouragement and forward going energy as a linearised motor, a synchronised accelerating wave front. For the ILC community and upcoming worldwide giga-science in general, it has been playing an example role of international coordination for cooperation and collaboration between regions, countries, institutions and universities. I believe that the following LC Newslines will keep driving the LC train on rails.

At the moment of transition from ILC Newslines to LC Newslines, I thank sincerely Prof. B. Barish, director of GDE, the initiator and director of ILC Newslines, a great director of ILC accelerator collaboration, a truly global pre-project accelerator collaboration. Working with him is a great pleasure and unique opportunity for me to learn important things in my scientific career. Hosting two meetings in 2007 and 2010 in Beijing gave me other opportunities to introduce Chinese politicians to Barry and through Barry to our community, which is very important but still not enough, aside from our technical advances with the release of goal reached TDR as promised to ILCSC. Even as an accelerator physicist, I have enjoyed each communication with Professor Sakue Yamada, director of RD, both for his rich international scientific experiences and for his emphasising culture exchanges and appreciation, which are greatly needed for an international endeavour like the ILC. Under his leadership, RD finished the BCD for detectors with good quality. Congratulations for Barry and Sakue!

From Shin-ichi Kurokawa (Former ACFA and ILCSC Chair)

I highly appreciate Barry and Sakue's devotion, leadership and hard work. Their contributions to the ILC project are tremendous and I am very much honoured to have been to work with them as an ILCSC Chair.

From François Richard (former co-chair of the Worldwide Study and regional detector contact for Europe)

I remember in October 2010 when I lost my bet with Barry about the attendance of the International Workshop on Linear Colliders at CERN : I said <350 and we were almost 500... The outcome of the bet was a nice dinner at Le Dôme Montparnasse. On another occasion, as I was asking Samoan (Barry's wife, Ed.), what was 'the secret of Barry', Barry (who never appears to be listening but is always fully aware of what goes on) immediately answered: 'She is my secret !'

I wish Barry a well-deserved rest, hoping that we can meet again in Paris for an another nice dinner and conversation.

From Atsuto Suzuki (Former ICFA chair)

I would like to express my heart-felt gratitude to Barry Barish, GDE Director, and Sakue Yamada, ILC Research Director, for their having been orchestrating the world-wide efforts that have culminated in the Technical Design Report (TDR). With the TDR placing a firm technical basis for the construction of the ILC and the new 125-GeV boson found at the LHC, I believe we are now ready to make a crucial step forward in realising the ILC project.

From Fumihiko Takasaki (Former GDE Asia Director)

Dear Barry

Thank you very much for guiding the GDE as the director for so many years. The timely completion of the GDE report would not have been possible without your excellent leadership. Your dedication and hard work will be long remembered by the people who have worked with you for the realisation of the ILC and who will do physics with the ILC in the future.

Thank you very much.

With best regards,

Fumihiko

From Yifang Wang (Member of the New Linear Collider Board)

GDE and RD made extraordinary contributions, not only to the science, but also to the international cooperation by its creative ways of operation. We all appreciate very much Barry and Sakue's efforts, and will continue along their way towards a successful construction of an international linear collider.

[GDE](#) | [ILC-CLIC COLLABORATION](#) | [ITRP](#) | [PHYSICS AND DETECTORS](#) | [TDR](#)

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DIRECTOR'S CORNER

A time of transition, or When men and mountains meet

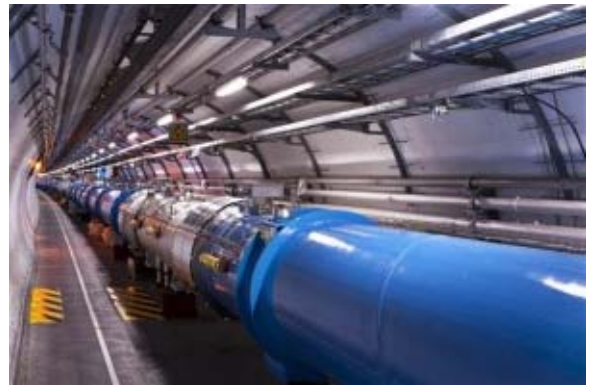
Barry Barish and Lyn Evans | [21 February 2013](#)

The past few years, we have made a great deal of progress in developing and demonstrating the enabling technologies needed for a linear collider for the two concepts that are being pursued: the International Linear Collider (ILC), based on Superconducting RF acceleration; and a potentially higher-energy option, the Compact Linear Collider study (CLIC), based on a two-beam acceleration scheme. Although the two-beam concept still has a way to go before a real project can be proposed, at a recent workshop at CERN it became clear that there is also considerable interest in using CLIC structures powered by 12-GHz klystrons for other applications such as free-electron lasers and compact medical accelerators.

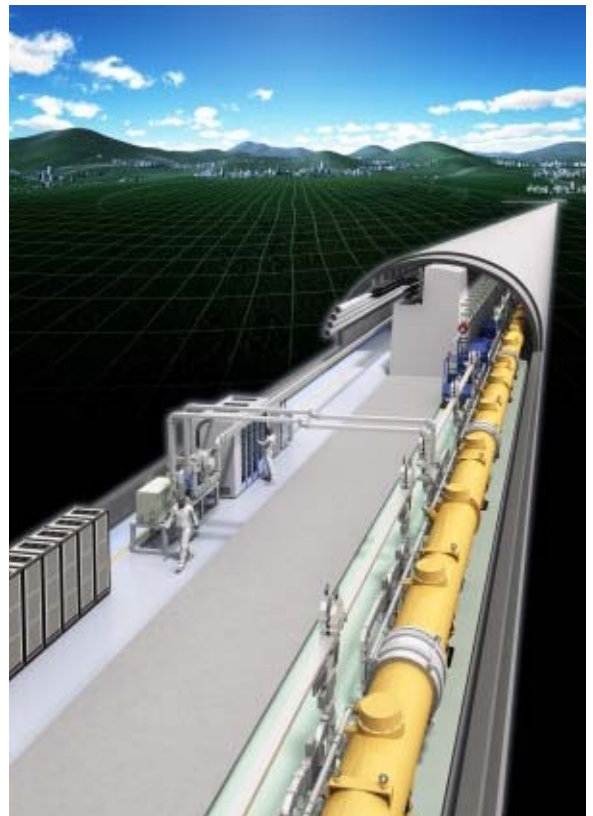
The Global Design Effort has completed and documented the ILC R&D accomplishments and demonstrations in a draft *Technical Design Report* (TDR), as well as presented a technical design for the ILC. The TDR also includes volumes on ILC physics and a detector detailed baseline design. It is presently undergoing final technical and cost reviews and will be published by summer. The completion of the TDR will mark the completion of what might be called the ILC *concept-to-design phase*. The new Linear Collider Collaboration is being charged with integrating the ongoing efforts for the ILC, CLIC and physics and detectors, and leading the next phase of the effort, from *design to a project*.

The discovery of the Higgs-like particle at the Large Hadron Collider has provided added strong physics motivation for a future complementary lepton collider. The Higgs is a completely new type of particle, unlike any other (for example it has zero spin and couples to mass). To understand the underlying physics will require that we determine its spin, couplings, and other characteristics. That will require a comprehensive future programme, first at the LHC, and then on a complementary electron-positron collider. If this particle is indeed a result of the mechanism for creating mass as proposed by Peter Higgs and others, then we must understand whether it is the simple Higgs mechanism or an alternative. The worldwide community is discussing various ideas for how to best pursue these questions, both at the LHC, and with a dedicated future electron-positron Higgs factory. The leading candidate for such a Higgs factory is a staged version of the ILC, beginning at 250 GeV and then upgradable to higher energy in the longer term.

The Japanese have proposed two candidate mountainous sites for the ILC, one in the Kyushu district and the other in the Tohoku district, and are discussing plans for building a Higgs factory as the initial step of a staged ILC. The sites in Japan are high enough into the mountains to provide a



The Large Hadron Collider at CERN – built and delivering exciting scientific results. image: CERN



The International Linear Collider – about to publish its Technical Design Report. Image: ILC, Rey.Hori

stable granite geology for an underground tunnel and facility. The GDE TDR includes both designs for a more traditional deep underground site and for such a mountainous site. The Japanese sites will have near horizontal access (an advantage), but further distances to the surface (a disadvantage). Overall, the GDE has concluded that the Japanese mountainous sites represent viable options for the ILC and that such a facility will be comparable in cost and for technical design, performance and risk as a deep underground site.

We very much welcome the timely Japanese proposal to host the ILC. The remaining work of the GDE and initial work of the LCC will focus on site-specific designs, costing and planning to create an international facility in the Japanese mountains. As we ponder such a future for the ILC and for particle physicists in the Japanese mountains, we might recall William Blake's poetic words, "*Great things are done when men and mountains meet.*"



The CLIC test facility, where crucial R&D will continue to be made. Image: CERN

[CLIC](#) | [GDE](#) | [ILC](#) | [LINEAR COLLIDER COLLABORATION](#) | [TECHNICAL DESIGN REPORT](#)

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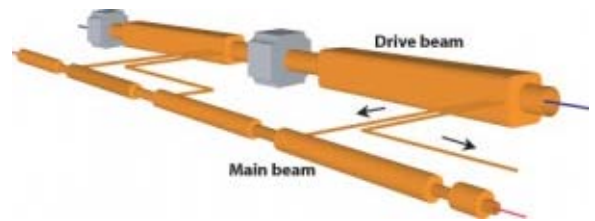
Drive Beam

Daisy Yuhas | [21 February 2013](#)

The Compact Linear Collider (CLIC) is designed to bring electrons and positrons into collision at 3 TeV within just 50 kilometres. To reach that collision energy, a typical accelerator design would be anything but compact—easily spanning more than one hundred kilometres. “You would need tens of thousands of klystrons,” says CERN scientist Steffen Doebert.

Instead, the CLIC design makes use of an innovative two-beam solution. In addition to the main beam of particles used for studying collisions, CLIC will have a second stream of particles called the drive beam. The drive beam will serve as a power source, propelling the main beams to 1.5 TeV each for a 3 TeV collision.

To do this, the drive beam runs parallel to the main beam but travels in different directions—starting at the centre and moving outwards, where it will be distributed and turned around in 24 sectors such that the drive beam bunches will coincide with the incoming travel of particles along the main beam. The drive beam meanwhile, which runs at 2.4 GeV, requires 1,600 klystrons to accelerate. The drive beam will provide short pulses of high radiofrequency peak power. When drive and main beam bunches coincide, a special structure will decelerate the drive beam, gathering energy and transferring it to the main beam. This approach is also very efficient, carrying radiofrequency power in the drive beam with more than 95 percent efficiency.



The Compact Linear Collider

[ACCELERATION](#) | [CLIC](#) | [DRIVE BEAM](#)

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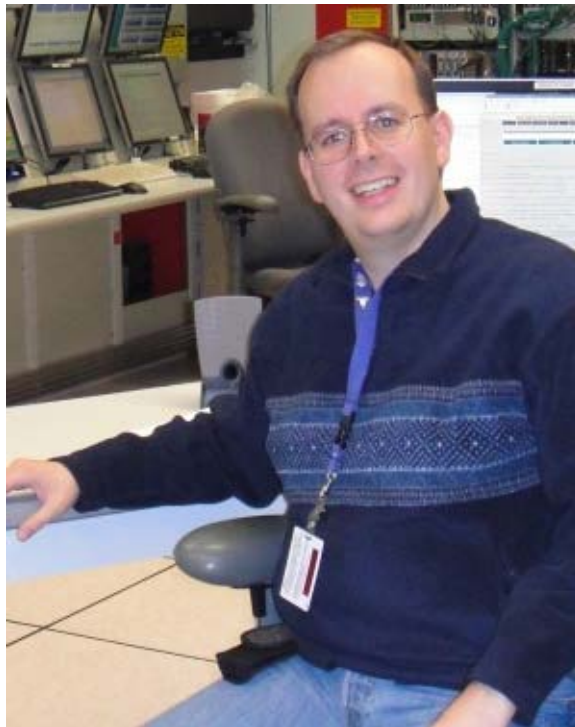
IMAGE OF THE WEEK

Andy White and Marcel Stanitzki new SiD spokesmen

Barbara Warmbein | [21 February 2013](#)



Andy White from the University of Texas in Arlington.



Marcel Stanitzki of DESY.

There is a change at the helm of SiD, one of the two detector concepts for the ILC. After John Jaros and Harry Weerts have pushed SiD the LOI, the validation of SiD as one of two ILC detector concepts and collaboration in the CLIC CDR, the time is right for two new spokesmen to take over. These are Andy White and Marcel Stanitzki, whose role now is to strengthen the SiD detector concept and attract new collaborators from all the regions and and continue to develop and improve the SiD concept.

DETECTORS | SID

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