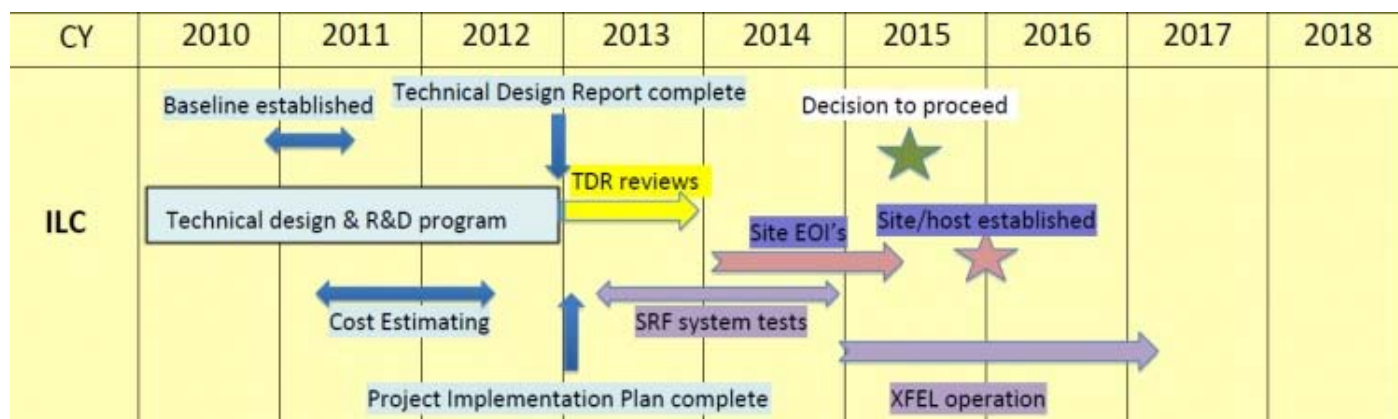


## DIRECTOR'S CORNER

### Interim report from the ILC-CLIC general issues group

by Barry Barish



A freshly released report from the ILC-CLIC working group on general issues summarises general issues and synergies involving a future a linear collider. It also discusses plans for the ILC and CLIC efforts to identify common issues regarding siting, technical issues and project planning.

## FEATURE

### *From symmetry breaking:* Particle Physics Photowalk Exhibits Open Around the Globe?



Sure, particle physics machines are highly functional beasts, but their visual allure also becomes clear in the photographs from the first Global Particle Physics Photowalk, soon to be on exhibit around the world.

## RESEARCH DIRECTOR'S REPORT

### ILC community meets in Oregon for ALCPG11

This month's Research Director's Report was written by Jim Brau, co-chair of the Worldwide Study and regional detector contact for the Americas.

by Jim Brau



On the eve of the 2011 ILC Americas regional meeting meeting, Jim Brau reports on the progress which has been achieved in the ILC detector and physics field since the last meeting in 2009.

[Learn more about the photowalk.](#)

## IMAGE OF THE WEEK

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## TPC in the right light

Image: DESY / Heiner Müller-Elsner

The test beam season is about to start and the prototype of the ILD time projection chamber is being prepared for a round of new tests in the DESY testbeam facility – captured here by a professional photographer.

## IN THE NEWS

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From CERN Bulletin  
14 February 2011

[Scintillating crystals: the best things come in small packages](#)

The European project ENDO TOFPET-US, which involves a team from the PH Department, was officially launched last month.

From CERN Bulletin  
14 February 2011

[AIDA – pushing the boundaries of European particle detector research](#)

AIDA (Advanced European Infrastructures for Detectors at Accelerators), a new project co-funded by the European Union and worth a total of 26 million euros, will be officially launched at CERN next week.

From National Science Foundation  
11 February 2011

[The Year of the Higgs? A Live Webcast From NSF](#)

Prior to startup, we will talk to physicists from two of the experiments, CMS and ATLAS, to hear about the search for the Higgs boson and what to expect in 2011.

From Nature  
10 February 2011

[US science agencies targeted for cuts](#)

Energy research and environmental regulation among areas hardest hit in proposed budget plan.

From ars technica  
10 February 2011

[Science's burden: storing terabytes of research data for decades](#)

Scientists in all fields collect large amounts of data, and it's not always easy to organize, preserve, analyze, and use all of it in the best possible way.

From Science Business  
2 February 2011

[Euro 26M project to develop EU research infrastructure for particle physics](#)

An EU funded project aims to upgrade, improve and integrate major research infrastructures in Europe

## BLOGLINE

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16 February

*Fermilab*

Proposed FY2011 budget cut would be tough on Fermilab

## CALENDAR

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### UPCOMING EVENTS

End Station Test Beam (ESTB) Workshop 2011  
SLAC

17 March 2011

2011 Linear Collider Workshop of the Americas (ALCPG11)

University of Oregon, Eugene, Oregon, USA

19- 23 March 2011

2011 Particle Accelerator Conference (PAC'11)

New York Marriott Marquis Hotel, New York, NY, USA

28 March- 01 April 2011

[View complete calendar](#)

## PREPRINTS

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### ILC REPORTS

2010-027

Report of the fifth meeting of the ILC Project Advisory  
Committee (PAC)

### ARXIV PREPRINTS

1102.1892

Charged Higgs Boson Physics at Future Linear Colliders

1102.1883

Fermion Condensate as Higgs substitute

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## DIRECTOR'S CORNER

# Interim report from the ILC-CLIC general issues group

Barry Barish | 17 February 2011



CLIC and ILC projected schedules, aligned with expected LHC results

On 11 January 2010 the ILC Steering Committee and the Compact Linear Collider study (CLIC) Collaboration Board created a working group to exploit synergies and discuss general issues involving the linear collider. That group has met regularly throughout the last year and submitted an interim report to their respective oversight groups this month. So far, they have concentrated on the first two elements of their charge: identifying synergies to enable the design concepts of the ILC and CLIC to be prepared efficiently and discussing plans for ILC and CLIC efforts to identify common issues regarding siting, technical issues and project planning. Their [interim report](#) summarises discussions and draws some preliminary conclusions.

The general issues working group consists of Eckhard Elsen (DESY), Mike Harrison (BNL, co-chair), Philippe Lebrun (CERN, co-chair), Ken Peach (Oxford), Daniel Schulte (CERN) and Kaoru Yokoya (KEK). So far, the group has concentrated on discussions and recommendations for the next few years, because of the great uncertainties on the longer term. For example, how will the LHC

physics results affect the desired initial energy? How will reduced CLIC funding and post-2012 ILC organisational issues affect the future programmes?

Collaborative work is proceeding through working groups on beam delivery systems and machine-detector interface, civil engineering and conventional facilities, positron generation, damping rings, beam dynamics and cost and schedule. The general issues group's survey of these areas found that for the most part the work has proven constructive and recommends continuation of the activity of the specialised CLIC-ILC joint working groups for the benefit of both projects.

One of the most difficult issues to deal with for the linear collider is siting. In the absence of a determined host country, laboratory or site, we need to approach the problem as realistically as possible. For the ILC reference design, we analysed 'sample sites' in three regions of the world: Asia, Europe and the Americas. The spirit of those studies and those we are now doing for the ILC technical design are to determine both the technical requirements on the sites and how the sites affect the design of the linear collider.

The ILC-CLIC general issues group discussed the relationship between the choice of technology and the location of the linear collider. After much discussion, this joint group made the following interesting statement:

*The Linear Collider is a completely new accelerator complex, that is, there is as of today no substantial existing accelerator infrastructure that could be re-used to reduce the overall cost of the machine. As a consequence, there is no coupling between the site selection and the technology choice on the basis of any existing legacy infrastructure. If the Linear Collider could be built at or near an existing accelerator laboratory, the existing administrative, technical, office and laboratory infrastructure could be used, thus reducing the overall cost significantly when compared with a 'green field' site. However, for an international project of this size, it is assumed that the host provides an infrastructure that is able to deal with the needs of the international community during*



Philippe Lebrun and Mike Harrison, co-chairs of the ILC-CLIC general issues group

construction and use of the facility. Consequently there is no compelling reason to constrain the site selection to existing laboratories.

There are some other substantive conclusions in this interim report. For example, the group looked at various phased approaches to the linear collider and concluded that, "On balance, the working group does not find the potential for cost savings in a phased approach to a linear collider compelling enough at this time to warrant any significant effort to investigate further." Because of the substantial cost of a linear collider, this is a question that is brought up periodically. It may be that future developments will motivate a re-examination of the issue, but at present this conclusion reduces the number of options we should explore.

The report also recommends that both the ILC and CLIC communities should agree on what systems tests will be needed before the project can go forward – that the GDE should share – and gave some guidance for how the joint work on costing should be approached.

I have stated previously that, in my opinion, our joint goal should be to have "one linear collider community" that jointly supports one well-conceived global project, ILC or CLIC, once the LHC opens up this new physics frontier and points the way. This interim report of the ILC-CLIC general issues working group is a thoughtful step toward realising that aim.

[CLIC](#) | [CONVENTIONAL FACILITIES AND SITING](#) | [ILC BASELINE](#) | [SITING](#)

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| The FFS: CLIC Vs ILC                                                                                                                                   |                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| CLIC                                                                                                                                                   | ILC                                 |
| 20% lumi loss from SR                                                                                                                                  | Negligible SR                       |
| $\sigma_y \approx 1 \text{ nm}$                                                                                                                        | $\sigma_y \approx 6 \text{ nm}$     |
| $\beta_y = 70 \text{ }\mu\text{m}$                                                                                                                     | $\beta_y = 400 \text{ }\mu\text{m}$ |
| Chroma. $\approx 6.3 \times 10^4$                                                                                                                      | Chroma. $\approx 1.5 \times 10^4$   |
| IP $D'_x = 1.4 \text{ mrad}$                                                                                                                           | IP $D'_x = 9 \text{ mrad}$          |
| Energy spread $\approx 0.3\%$                                                                                                                          | Energy spread $\approx 0.1\%$       |
| CLIC FFS is considerably more challenging in every aspect. ATF2 is the common playground but CLIC requires Ultra-low IP $\beta$ (see E. Marin's talk). |                                     |
| Exoplanets    Telescopes    Corals    The CLIC Beam Delivery System    p.11/14                                                                         |                                     |

Joint working group comparison of ILC and CLIC final focus requirements

## RESEARCH DIRECTOR'S REPORT

# ILC community meets in Oregon for ALCPG11

This month's Research Director's Report was written by Jim Brau, co-chair of the Worldwide Study and regional detector contact for the Americas.

Jim Brau | 17 February 2011

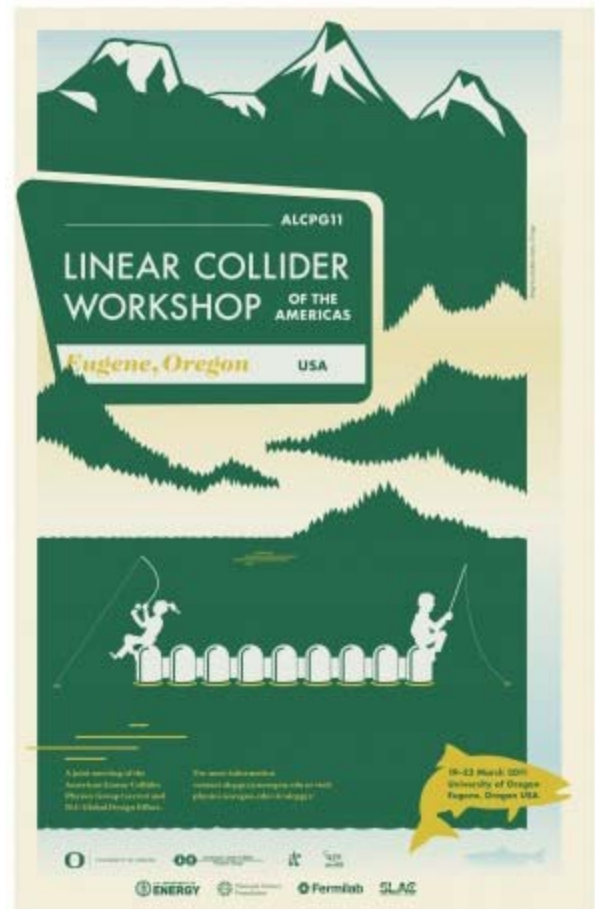
I've been spending a good fraction of my time over the past weeks preparing for the next regional workshop in the Americas (ALCPG11), which will be held on my home campus, the University of Oregon, US. I'm excited that so many colleagues from all over the world will be visiting Eugene. I'm sure we will have a fruitful workshop, addressing a myriad of collider, detector, physics and overlapping issues.

Much progress has transpired since the last Americas regional meeting in Albuquerque. At that meeting, the International Detector Advisory Group (IDAG) validation process had just been completed and the two validated detector groups were given the challenge of preparing their detailed baseline designs (DBD) and documenting them in the DBD reports, which will now be completed by the end of 2012. We are half way there now, and much has been done, but a lot of the heavy lifting remains. ILD and SiD (the two validated detector groups) will be meeting again with the IDAG in Eugene to discuss their status, expectations and plans toward DBDs for the coming year.

During the Albuquerque workshop the full community of machine builders, experimenters and theorists joined in a plenary discussion on the re-baselining process that the Global Design Effort had begun. This was the first formal presentation by the accelerator community to the future users of the new design, then called Strawman Baseline or SB2009. We discovered differences in perception of the trade-offs that must be made in working through a design that balances costs, risks and performance. Each group within our community looks first towards particular sides of this balancing act. The experimenters and theorists place particularly high priority on physics performance of the future ILC. Quantifying physics performance is not trivial, and trade-offs must be made even when consideration is given simply to physics. However, we also know that costs and risks are essential factors to be considered.

Following the Albuquerque meeting, a much closer communication channel was opened. A group was created by Research Director Sakue Yamada to consider the physics and experimental issues of the new design., Sakue asked me to chair this group and we worked closely with the GDE collaborators to clarify issues and work towards an optimised design. Already by the time the community came together again in Beijing for the ACFA Linear Collider Workshop in March 2010, there was better definition and better understanding, as well as the first efforts by accelerator colleagues to address the concerns of the physics community with new machine ideas. These matured in the following months, as we moved towards the Baseline Assessment Workshops (BAWs).

At KEK for BAW-1 in September 2010 and at SLAC for BAW-2 in January 2011, the final re-baselined design was



*The linear collider community meets in Eugene, Oregon, in March.*

discussed and completed. In the end, as a result of much effort and good communication, we have achieved a more robust and higher-performing design.

Now we come together again in the Americas for ALCPG11. We are planning a very strong physics programme, with eight parallel sessions and two plenaries devoted to physics. Other topics presented in the plenaries will include Tevatron results, LHC status and plans and work on the Compact Linear Collider study (CLIC) detectors. There will be a lot of reference to the LHC experiments, particularly in the physics talks and in the LHC reports themselves. These are critical to the prospects for the ILC. The detector R&D programme continues to be strong and productive, and we can expect very interesting recent results to be presented. Both SiD and ILD plan their own plenary sessions. And we expect, once again, to have good interaction with our machine colleagues.

I am looking forward to greeting you next month.

[ALCPG](#) | [ALCPG11](#) | [DETECTOR R&D](#)

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