

U.S. university engagement with the ILC: a report to the Americas Regional Team

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This document: http://www.hep.uiuc.edu/home/g-gollin/Linear_collider/Universities_Gollin_LCWS07.pdf

Universities bring...

There are the obvious things: students, as well as colleagues with expertise that can be expensive for a national lab to obtain from industry partners.

But there are also advocacy resources:

- working relationships with state legislatures and federal congressional delegations
- good will from influential alumni who speak out on matters of interest to the university
- faculty who, once engaged, can act as ambassadors for projects, and who are unlikely to be viewed as acting primarily in the interests of a national laboratory

University problems

Resources are tight: many of our base grants have shrunk to the point where we have had to

- require our graduate students to teach;
- reduce the number of postdocs we support;
- eliminate positions of technical staff who retire.

We teach. This is a significant commitment of our time, and a source of frequent, unpredictable interruptions.

University ILC accelerator R&D history (c. 2002)

January, 2002:

- FNAL was focused on Run II problems.
- Most university LC groups were already affiliated with SLAC; most were doing detector simulations.
- There was little planning underway to attract new groups (for example, with Fermilab orientations).

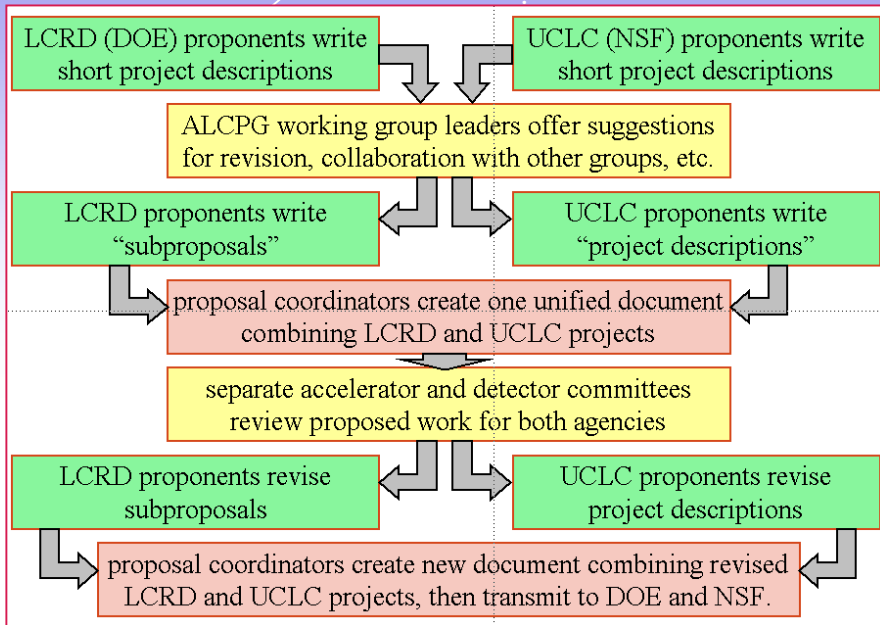
April - May, 2002 workshops at FNAL, Cornell, and SLAC:

- Meetings focused largely on concrete R&D topics
- Purpose: introduce university physicists to R&D issues suitable for university groups, help them get started.
- Tom Himel's marvelous list of projects generated interest.

What we were thinking in 2002

- There wasn't an LC “central design group” yet, and there wouldn't be one for a few years.
- We would need to guess at a structure for an R&D program that would fit naturally into a global R&D effort once that existed:
 - individual project proposals grouped by topic (comments)
 - proposed projects to be reviewed and “adjusted” by experts
 - collaborations across funding agency boundaries to be easy to organize
- We wanted the U.S. funding agencies to respond to an HEP community desire for the LC to go forward, and to view it as a larger-scale effort than a big project proposed by a national lab.

University R&D consortia, FY2003

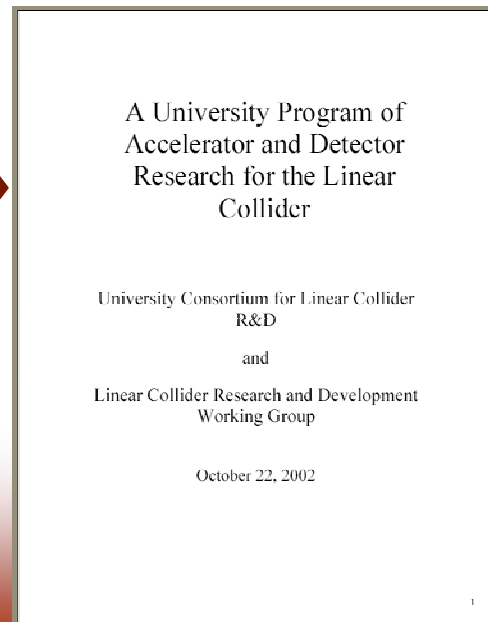


The result:

- 71 new projects (~half in accelerator physics)
- 47 U.S. universities
- 6 labs
- 22 states
- 11 foreign institutions
- 297 authors
- 2 funding agencies
- two review panels
- 8 months from t_0

Funded by NSF* and DOE

Renewed annually.



The shape of things

DOE and NSF found it complicated to work together in support of university-based ILC efforts. We formed two closely-linked organizations to establish separate interfaces with the agencies:

- UCLC projects (NSF) were combined into a single large proposal, centrally managed by Cornell. But these projects received minimal funding.
- LCRD projects (DOE) received funding but could not be centrally managed since resources flowed directly from the agency to individual investigators without a project manager.

We hoped that projects would make progress and would later be absorbed by a topics-based global R&D effort once that came about.

Sometimes this happened, sometimes it didn't.

A case study

Damping ring + kicker R&D can serve as a case study.

- initial interest at UIUC and Cornell
- UIUC - Fermilab cooperation led to a small effort that also included Cornell, ANL and LBNL
- early results:
 - 6 km damping ring beam dynamics looked good (yipee!)
 - U.S. began playing a significant role in global damping ring and kicker R&D
 - Fourier series kicker too “cute” but HV stripline probably OK
- A problem: FNAL became less involved, so UIUC connection to DR effort became difficult to maintain. (learn from this...)

A U.S. university-based R&D program, version 2

See *Encouraging Greater Engagement by U.S. University Groups With International Linear Collider Accelerator R&D Projects* for a discussion of the structural deficiencies of the previous university program, and proposed remedies:

http://www.hep.uiuc.edu/home/g-gollin/Linear_collider/new_university_program_discussion_paper_v2.pdf

GDE exists, and WBS leaders have been named. But we do not yet have an efficient mechanism to

- identify university-suitable projects (should be of direct interest to a national laboratory)—a task for experts
- identify university groups that will work on the projects
- identify the national lab scientists who will monitor the projects
- stream resources to universities very soon after project acceptance.

Key aspects of version 1

- identify university-suitable projects (should be of direct interest to a national laboratory)
 - Tom Himel's list, but no strong connection to national labs' interests was required
- identify university groups that will work on the projects
 - Several of us made loads of phone calls
- identify the national lab scientists who will monitor the projects
 - Usually not done, except informally at best
- stream resources to universities very soon after project acceptance.
 - Proposal funding model, rather than project-based model, made this impossible. Review process sometimes appeared inefficient in spite of best efforts of talented review panels.

Gauging the level of ILC interest at universities

We identified all (or nearly all) the universities hosting experimental HEP efforts and interviewed a physicist at the majority of them.

Engagement by U.S. University Groups With International Linear Collider R&D Projects

A report to the Vice Chancellor for Research, University of Illinois at Urbana-Champaign

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The stats (1)

- 53 of 104 universities (51%) have participated in one or more LCRD/UCLC ILC proposals;
- 62 of the 81 universities about which we obtained information (77%) are participating in ILC work through LCRD/UCLC proposals or else have developed clear plans for ILC activities that will commence sometime during the next few years;
- 13 of the 81 universities about which we obtained information (16%) are not currently participating in ILC work and have not developed clear plans for ILC activities. In spite of this, these universities do plan to incorporate an ILC activity into their group's efforts sometime in the near future;

The stats (2)

- 75 of 81 universities (93%) are either participants in LCRD/UCLC proposals, have clear plans for ILC involvement, or expect to develop a plan for ILC involvement in the near future;
- Physicists at more than half the universities in our list would be interested in collaborating on accelerator physics R&D projects, even though their previous work has concentrated on detector physics R&D.
- If we assume that half of the 23 schools about which we obtained no information would like to participate in ILC, then ~86 of 104 schools with HEP efforts are/have been interested in ILC projects.

Conclusions

I need help determining:

- what projects are of direct interest to the labs and are appropriate for university participation;
- who at the lab will monitor the progress of the project and integrate it into the lab's efforts.

A two-paragraph description for each project, clear enough for a university physicist to imagine what the project would be like, is ideal.

I need help publicizing the R&D opportunities:

- is there a particular university physicist who should be approached first for a particular project?
- is university expertise of a particular kind an important consideration? (This helps identify which groups should be approached first.)