Director's Corner

David Burke

The Secretary of Energy has released a much-anticipated 20-year plan for new major research facilities across the fields managed by the DOE Office of Science. It is exciting that construction of the international Linear Collider is a high-priority goal of this plan.


DOE Office of Science Director Ray Orbach has created this prioritized list of 28 projects needed over the next 20 years to pursue the missions of the DOE. Putting this list together has been far-reaching, and many proposals did not make the final cut. The plan includes projects already under way, mid-term projects in conceptual stages (the Linear Collider is the highest priority project in this category), and long-range projects still in early proof-of-principle R&D. While this plan is not a proposal for funding, it is significant that the Secretary has taken “ownership” and brought forward this roadmap to the future.

The international scientific community is moving rapidly to make a choice for the linear collider accelerator technology, to begin to work on a common machine, and to present a plan for the collider project to the various governments. With our collaborators, we are ready to demonstrate that the X-Band technology is the key to exploring the energy frontier - it will be an exciting year.

The Collaboration met recently at Fermilab to review goals, priorities, and plans for 2004. Our priorities are focused on things that: (1) are necessary for the international technology recommendation; (2) are important for the technology recommendation and can yield information in time for the decision, and (3) are important for the realization of a collider regardless of the accelerator technology.

Completion of the 8-Pack SLED-II and maintaining an aggressive building and testing schedule of high-gradient structures will continue to dominate our activities. These are the key demonstrations of the 1 TeV capability of the X-Band technology. End Station B (NLCTA) will remain a very busy place. But the Collaboration worked hard to sharpen ideas that can yield information in the next six months or so. Simulation and R&D on the electron cloud effect in position damping rings, study and calculation of mechanical vibrations produced by equipment and infrastructure, and completion of a two-pack modulator that can drive a pair of PPM klystrons are all within reach and can yield important information and demonstrations. All members and institutions in the Collaboration have critical parts to play in meeting these goals.

Next Linear Collider Planning and Budget Meeting

Peter Tenenbaum

The United States’ Next Linear Collider (NLC) collaboration held a Planning and Budget meeting at Fermilab on the 28th and 29th of October. The context of the meeting was the following:

The Federal budget appropriation for linear collider research and development for Federal Fiscal Year 2004 is expected to be about the same as the budget for FFY 2003, or about $19 million.

In addition to purely financial limitations, many NLC staffs are already overcommitted in FY04 and therefore some projects will be unable to make rapid progress because they rely on people who are entirely absorbed in other projects.

The International Linear Collider Steering Committee (ILCSC) is empaneling a group of 12 “Wise Persons,” who will be charged with picking a linear collider technology (superconducting or normal conducting) by the end of calendar year 2004.

The goal of the meeting was to identify those projects which are most critical as input to the technology decision, and ensure that they receive sufficient funding and attention to reach fruition by the middle of calendar 2004. In addition, the selection of a technology for the linear collider is expected to completely change the worldwide LC environment, which heretofore has been operating essentially in preparation for such a choice. The secondary goal of the meeting, then, was to consider how the US NLC collaboration will adapt to this monumental change to its environment.

During the course of the meeting, status reports were presented by the NLC subgroups working on rf power sources, rf structures, injector systems, damping rings, low emittance transport, ground motion/vibration, and site selection/evaluation. A number of working groups broke out for separate, smaller meetings on the afternoon of October 28th. The upshot of all the meetings is that the demonstration of the main linac rf system, which was highlighted so prominently in the International Linear Collider Technical Review, is the priority of the NLC collaboration. Additional high-priority items include demonstration of “extended object” test, and conceptual and experimental studies of the vibration problem in the context of the superconducting final doublet magnets.

Given the intense focus on preparation for the coming fiscal year, the discussion of the evolution of the NLC collaboration after the technology choice was necessarily somewhat abbreviated — indeed, it was discussed for roughly one hour at the end of the first day. The session included a vigorous discussion on the merits of an Engineering Test Facility (ETF), which was envisioned as a several-GeV segment of the main linac. Steve Holmes volunteered the FNAL accelerator physics and engineering staff for a study on the possible goals and scope of either a warm or a cold ETF; Holmes estimated such a study could and should be completed by the end of calendar 2004.

Eight-Pack Update

David C. Schultz

Progress in the 8-Pack project has been rapid in the last two months. The system assembly was completed and the system passed its final cold test. The system was pumped down, and then tested at low power (<1 MW) was drawn from the klystrons and sent through the system. The warm test exercised the full operating system; the modulator, the LLRF system and the high power geometry. The system was then vacuum baked at the conservative temperature of 150 – 180 C. After the bake out, the system was again cold tested to ensure that there had been no adverse changes.

Now the 8-Pack Phase 1 system is undergoing high power processing by the NLCTA operators under the direction of Professor Tantawi. The power from the klystrons is gradually raised, individually and in pairs, as the high power system is monitored for vacuum bursts and reflected energy. Good progress is being made with a slow and steady gain in combined power.

A hearty congratulations is due every NLC member who has contributed to the success of the 8-Pack effort.
Nicolle Ragar, a graduate student intern from the science illustration program at the University of California at Santa Cruz, produced this image of an in situ section of NLC while working in the SLAC Communications Department this past summer.

More on Fermi Structures

Check out the following link!
http://www.fnal.gov/pub/today/today03/10-20.html

Recent Publications

LCC Notes

LCC-0124, "Recent Electron Cloud Simulation Results for the NLC and for the TESLA Linear Colliders," M. T. F. Pivi, T. O. Raubenheimer, M. A. Furman, September 2003.


Upcoming Conferences and Workshops of Interest

9th International Workshop on Advanced Computing and Analysis Techniques in Physics Research (ACAT03), 1-5 December 2003, Tsukuba, Japan, http://www-conf.kek.jp


ISG-11, Dec. 16 - 19, KEK, Tsukuba, Japan.


