

Charge for the SLAC Scenarios Study

Background

The world HEP community has decided that the next large accelerator project after the LHC should be a high energy, high luminosity $e+e-$ linear collider (LC). This will be a multi-billion dollar accelerator project with participation of major physics labs around the world. SLAC will be a major participant in the design, construction, operation and exploitation of this facility, independent of where it is sited and what technology is chosen. However the model for SLAC's participation has not yet been determined.

The PEP-II/BaBar program has an exciting future throughout this decade. The B physics program in the next decade will be shaped by what is learned in this decade and a next generation B factory is under consideration by the community and SLAC.

SLAC, in partnership with the Physics and Applied Physics departments on campus, has started a new Institute for Particle Astrophysics and Cosmology. Building on the experience with GLAST, SLAC and the Institute will be participating in new major initiatives in particle astrophysics throughout this decade and into the future.

As we look towards our future, what are the exciting physics opportunities for SLAC to be engaged in as we look forward to the next decade? Will they be on site, off site or in space? How do the projects we may be doing utilize the lab manpower and infrastructure? How does this depend on the LC technology choice and the siting of the linear collider?

Goal

This committee should prepare a white paper for the Laboratory Director entitled "Scenarios for the Future of SLAC". It should look at what may be happening at SLAC in the next decade while an international LC is being built and operated. This paper should be completed by October 1, 2003. Information for it should be gathered in an open fashion involving the SLAC faculty, staff and users. There are many possible scenarios. These should be reduced to some illustrative examples that are examined in detail to provide a picture of the size and vitality of the laboratory.

Suggested process

We envision that the study would consist of three distinct but interrelated parts:

- Part A of the study would focus on developing models of SLAC as partner in a future Linear Collider. This part of the study would include discussion of:
 - What might the ownership pieces of an LC be for SLAC in various scenarios?

- What is the impact of the technology choice; does it affect the models?
- What is the impact/non-impact of the site selection?
- What might be the axes of division of the LC project among the partners?

- Part B of the study would provide a look, albeit superficial, at other potential HEP and Particle Astrophysics activities at the lab in the LC era. For these activities, the study should include a discussion of the physics case for each possibility and what needs to be done to develop it further. Also a ballpark cost and assessment of technical difficulty along with R&D issues to be pursued should be included. It would be useful to explicitly consider which activities might be appropriate on the SLAC site if the LC is off-shore versus on-shore, and similarly which activities might be carried out at other labs in various off/on shore scenarios with SLAC as a significant participant. A partial list of options to be scoped is:
 - On SLAC site accelerator options
 - Super B
 - Higgs
 - Giga-Z
 - Advanced Accelerator R&D
 - Other
 - Particle Astro and off SLAC site accelerator options
 - Particle Astro post GLAST
 - EXO
 - Other Neutrino options
 - LHC Upgrades
 - Other

- Part C of the study would be to evaluate how a subset of the scenarios fit into an overall picture of lab manpower and budget, including resources dedicated to SPEAR3 and LCLS.

Suggested Timeline

We would encourage the committee to begin the process with a meeting of the laboratory research staff and users to alert them to the existence of the committee and a description of how the committee intends to proceed. We encourage the committee to use internal and external seminars in the information gathering process and to advertise the seminars widely to aid in the general education of the scientific community as the process develops. Research staff and users of SLAC external to the study group should be drawn on as technical and scientific resources throughout the exercise.

A suggested strategy and timeline for the functioning of the committee is:

- Phase I (2/03 – 5/03)
 - Homework on Charge Part A
 - Hold series of seminars to develop realistic models for addressing part A of the study charge. These will be informal, and should engage much of the SLAC community working on LC R&D, as well as users from the University Community involved in LC R&D, in a meaningful way.
 - Realistic timescale indicates that 2/03 will be used for homework and seminars will take place in 3/03-5/03
 - Homework on Charge Part B
 - Develop a series of widely advertised talks from experts (internal and external to the lab) that address the physics case for various part B options. Consider broadcasting these talks on the web. Talks could take place 3/03 – 5/03.
 - Partner outside speakers with teams of insiders (not necessarily advocates) whose job will be to explore potential SLAC roles for these part B options along with cost/resource models for SLAC involvement.
 - 5/03 Roundtable with users and lab staff to discuss what has been learned and identify areas needing more study.

- Phase II (6/03)
 - Report on progress to SLAC SPC and solicit their inputs.
 - Define a finite number of illustrative scenarios for further study
 - Process: Done in committee; reported in public talk (well advertised)

- Phase III (7/03-9/03)
 - Sketch the Part C scenarios
 - Draft White Paper to the Director
 - Retreat to discuss final recommendations