

Physics Advisory Committee

April 7-9, 2005

CHARGE

Introduction

Most of the presentations at this meeting will provide preparation for discussions at the June meeting in Aspen. The topics covered include proposed experiments, continuing research programs, and preparations for future facilities.

Neutrinos

NO ν A (P-929)

The Laboratory has received a new version of the NO ν A proposal. Last June, the PAC made the following recommendation after reviewing the original proposal: "The Committee strongly endorses the physics case for the NO ν A detector, and would like to see NO ν A proceed on a fast track that maximizes its physics impact. Both the physics case and the detector design have undergone rapid evolution since the PAC first received the NO ν A proposal. While the Committee applauds this progress, it concludes that Stage I approval at this time is premature."

The original proposal included a preliminary design of a totally active liquid scintillator detector as an alternative option. The new proposal is based on a totally active 30k ton detector.

We would like advice from you on whether the NO ν A proposal represents the appropriate next step in the development of Fermilab's long-baseline neutrino program. The discussion may be influenced by the recent announcement of NuSAG, the HEPAP/NSAC subpanel on neutrinos. We will discuss with you at this meeting whether a recommendation on Stage I approval should wait for the discussion at the June meeting. In any case, we anticipate that the PAC will also ask questions of the collaboration that should be addressed by the time of the June meeting.

Please provide a written recommendation with respect to NO ν A.

FINeSSE (P-946)

After discussions with the Laboratory, the FINeSSE collaboration is taking a revised approach, including an augmented physics justification, and has submitted a new Letter of Intent. The PAC should consider this effort and ask questions of the collaboration as appropriate.

Please comment as appropriate.

MINOS (E-875)

MINOS will give a progress report.

MINER ν A (E-938)

The MINER ν A collaboration will present a progress report. They have been working with the Laboratory and the funding agencies to establish a funding plan, a process which is still in progress. The DOE Office of High Energy Physics has clarified that they will not fund construction of experiments through the university program. We are reconsidering the proposal as a project funded primarily through Fermilab.

Please comment as appropriate.

Fixed Target Experiments & Test Beam***MIPP (E-907 / P-948)***

The MIPP collaboration will present a status report and request upgrades of the experiment and an extension of the experiment. You may have questions; a recommendation can await the June meeting.

Please respond as appropriate.

ILC Test Beam Work

Over the past several months groups working on R&D for ILC detectors have put together a proposed program of test beam measurements (Fermilab-TM-2291). The CALICE collaboration will also make a presentation on test beam work for proposed calorimeter and muon detector technologies and make a request which requires more capability for the test beam than is presently available. The request will therefore need to compete for resources with other efforts, and will probably require adjustment of the priority for the test beam relative to Run II and NuMI. You may have questions for the collaboration or for the Laboratory, and this discussion may continue at the June meeting.

Please comment as appropriate and provide advice about how the Laboratory should approach this request.

Kplus (P-940) Rare Kaon Decays

After P5 recommended rejection of the CKM experiment because of funding constraints, the collaboration redirected its efforts toward designing a cheaper experiment, without the RF-separated beam. We have encouraged them to present their LOI, understanding that we should give them guidance at this time.

The collaboration is requesting support and encouragement to advance this initiative.

Please comment and provide a written recommendation as appropriate.

Proton Driver

A broad group led by Steve Geer has been developing and documenting the physics opportunities made available by a Proton Driver. He will make a presentation about this study to the PAC. Peter Meyers, chair of the advisory committee that is reviewing the physics study, will be available for the discussion.

Please comment as appropriate.

Particle Astrophysics

CDMS II (E-891) and SuperCDMS (P-947)

The CDMS group has received assurances from Fermilab that we will support:

- a) ongoing operations of the CDMS II detectors at Soudan; and
- b) cryogenic support for the R&D phase of the Development Proposal and, in particular, their current NSF MRI proposal.

Thus far the PAC has not discussed the complete program dubbed Super-CDMS. The collaboration is requesting Laboratory endorsement of this program, or by June, in order to provide a (necessary) laboratory anchor for the full project.

Please comment as appropriate.

AUGER (E-881)

The Auger Observatory is making good progress in installation, and anticipates physics results in the summer. They will give a progress report.

SDSS (E-949)

The Sloan Digital Sky Survey collaboration will report progress in securing funding for the three year extension of their program. This may be ready for Stage II approval.

Please comment as appropriate and provide a recommendation on Stage II approval for the SDSS extension.

DES (E-939)

The Dark Energy Survey is making progress in developing its funding, but the process is not complete. We are considering a review in the late summer or fall to establish a baseline and the adequacy of the funding. The group will give a status report on their technical progress and the development of their data handling plans.