PAC CHARGE
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Fermilab Physics Advisory Committee (PAC)
June 21-25, 2011
Snowmass Colorado

Long-Baseline Neutrino Oscillations – Joint Meeting with Some DUSEL PAC Members

The first day of the full Fermilab PAC meeting will include members of the DUSEL PAC. Presentations will be made on the status of the Sanford Laboratory and the Deep Underground Science and Engineering Laboratory (DUSEL), the Long Baseline Neutrino Experiment (LBNE), and the two national committee reviews in this research area.

The meeting occurs during a time of transition for US long-baseline neutrino experiment planning, with the NSF no longer planning to support DUSEL. The way forward is not yet established. We ask that, together, the two committees' members discuss the following issues and provide comments:

What will it take to keep the US program in long-baseline neutrino oscillations area vital?

What should be Fermilab's role in this effort?

In this context, also comment on the schedule and processes appropriate for decisions on the site and cavern depth for a far neutrino detector and the schedule and processes for various technology decisions.

Dark Matter – Joint Meeting with Some DUSEL PAC Members

Early on the second day of the meeting, direct dark-matter search experiments will be reviewed. This is also an area of research which was expected to take advantage of DUSEL. Again, please provide comments on:

What will it take to keep the US program in the direct searches for dark matter vital?

What should be Fermilab's role in this effort?

Dark Energy and Other Aspects of Fermilab's Particle Astrophysics Program

Recently, the Fermilab Center for Particle Astrophysics and the Division of Particles and Fields of the APS sponsored a workshop on Experiments on the Cosmic Frontier. The PAC will hear a review of the workshop as background for a discussion of the direction of dark-energy research, in particular, the Dark Energy Survey (DES) and later experimental efforts. Again, please provide comments on:

What it will take to keep the US program in dark-energy experiments vital?

What should be Fermilab's role in this effort?

Near-Term Experiments in Neutrino Physics

The PAC will hear a review of the current and near-term experimental neutrino physics program at Fermilab and around the world, a summary of the Short-Baseline Neutrino Experiments Workshop recently held at Fermilab, and about the NOvA Near Detector plans and options.

Please comment on:

1. Status and plans for the Fermilab near-term neutrino program.
2. The significance of the recent antineutrino results from MiniBooNE and MINOS and relevance for possible further antineutrino-mode running in the Booster Neutrino Beam and NuMI beam.
3. The progress of the MINERvA Experiment.
4. The progress of the NOvA Project.

MINERvA Letter of Intent to Add H2/D2 Target to Their Physics Prgram (E-938)

The Laboratory has received a Letter of Intent from the MINERvA Collaboration to operate the existing liquid helium target with liquid hydrogen and deuterium for cross section measurements in the NOvA era. Effort will be required to understand the safety and other issues associated with operating the target with these fluids underground, and with providing appropriate venting and possibly other needs to make this possible. Therefore, the physics justification of running with such targets must be significant and the data must be useful as part of the Laboratory's future program. Of course, it will come at the expense of having less helium-target data as well. The Laboratory would appreciate any comments on this possible expansion of the physics goals of E-938. What priority should such a proposal have for the engineering needs required to fully understand the implications of proceeding?

MINOS + Proposal to Run in the NOvA Era (P-1016)

The Laboratory has received a proposal from the MINOS Collaboration to collect data with the higher intensities which will be available in the NOvA era. The extra effort required of the Laboratory for this is not great. However, there will be a modest additional cost associated with maintaining adequate spares for both MINERvA and MINOS. Therefore, the physics justification of continued running must be significant and the data must be useful as part of the Laboratory's future program.

Other Topics

The PAC will hear a number of presentations on other areas of the Fermilab program: the Tevatron and LHC collider physics efforts, the experiments planned on muon physics, Project X accelerator and physics, a possible future Muon Collider and its physics program, and computing support for the Fermilab physics program.

We welcome any comments the PAC may have on the Fermilab program or issues raised in any of the presentations.