Minutes of 9 April 2005 Users' Executive Committee Meeting

Present: Alton, Bertram, Bloom, Finley, Gottschalk, Hagopian, Nguyen, Rolli, Tanaka, Trischuk
GSA: Catherine Kopic

Apologies: Artuso, Hughes, Messier

Chair Trischuk started the meeting at 9AM.

Report from the Users' Meeting Committee (Bloom):
The annual Users' meeting will be 8-9 June. The program of speakers is filling out, though several speakers still need to be selected by some experiments.
Among recently confirmed speakers from outside the Fermilab community include Charles Shank (former Director of Lawrence Berkeley Laboratory), who will talk about the EPP 2010 study, and Ewan Paterson (SLAC Associate Director), who will represent the Stanford Linear Accelerator Center.

Other activities:
1. Posters will be mailed out soon.
2. The program pamphlet is being created

The registration website is now set up at:
http://www.fnal.gov/orgs/fermilab_users_org/users_mtg/2005/

Users can now register at this website.

There was a discussion on a request to include a survey on why people, particularly women, leave the academic career path. It was decided that a link and an advertisement for the survey would be included on the meeting registration site, but the survey should not be a mandatory part of the registration.

Quality of Life Poll (Alton)
A website containing detailed results of the survey will be available on the UEC website soon. One of the outcomes of the survey is support for a job fair, possibly in November, and a series of "career night" presentations.

Report from the UEC Chair (Trischuk)

1. The bicycle program from last year was a success, and a few experiments are requesting more bicycles. The URA has offered to purchase 10 more bikes

The UEC chair and a former member of the GSA are currently doing the paperwork.
2. The UEC and SLUO chairs sent a letter congratulating Secretary Bodman on his recent appointment. Bodman may visit Fermilab in the near future.
3. Trischuk will attend the May HEPAP meeting.
4. Trischuk will make a 20 minute presentation to the URA Visiting Committee in late April.

Discussion with Fermilab Director Mike Witherell:

1: What is the status of the NuMI target?
The target has been removed; it was anticipated that the target would be replaced about once a year, so we planned for removing the target, but this is much earlier than expected. The new target is available, but the container
still needs to be built. There are two scenarios:
1.) We will be able to remove the water in the present target container
and configure it so it does not leak.
In this case, NuMI operations can restart in about 3 weeks.
2.) If we are not able to remove the leaking water, we will need to wait
for the new container. In this case, we will not resume operations for
about three months as the container is built.

There is a probable cause for the leak, but the exact site is not known. The
third target system will be re-engineered to prevent this from happening again. Outside experts are assisting in reviewing the new design.

2: What was the outcome of the Department of Energy's Operation Review?
The review, which was a merger of separate reviews of Run II and Operations,
went well. One comment was a recommendation to increase study times for the accelerator complex (as opposed to normal operations to integrate luminosity). We believe the balance of study and integration times is about
right, but we will investigate.

3: The Neutrino Scientific Advisory Group (NuSAG)
The chairs of the newly formed Neutrino Scientific Advisory Group, Eugene Beier and Peter Meyers, were announced yesterday by Robin Staffin. NuSAG has a two year timescale, but will produce a preliminary report in July. The focus of the ongoing Fermilab Physics Advisory Committee is to see whether NOVA can be granted in Stage I approval, which would be useful input
for NuSAG.
Otherwise, Stage I approval would be deferred till the Aspen PAC meeting.

There was a discussion regarding the site security changes that allow only
Fermilab employees to escort outsiders in restricted areas. Since these

areas include, for example, the collider experiment halls, it makes it impossible for users to give tours. The UEC will investigate whether this can be changed.

Tim Meyer: EPP 2010: Elementary Particle Physics in the 21st Century

The EPP2010 study has two main charges:
1: Place experimental particle physics (EPP) in the context of the national
basic research program and communicate its value and excitement to other scientific fields, government agencies, and the general public.

2: Present a credible future for the field over the next fifteen years.

The Committee, composed of 22 members, approximately half from the field of
particle physics, and half from outside, has met twice with members of the
field (in Washington D.C. and SLAC) and three times for committee discussion. The Committee will meet at Fermilab on May 16-17th, with future
meetings at
Cornell and Washington D.C. There will be "field trips" by smaller subcommittees to CERN, DESY, and KEK.

Among the goals of the Fermilab meeting are for the Committee to obtain an
understanding of the international nature of the research program, both for truly global projects like the International Linear Collider and projects like the Proton Driver. Ian Halliday, Yoji Totsuka and Albrecht Wagner will
participate in the meeting. The international picture is a hot issue; at Fermilab, the Committee will see the state-of-the-art in international collaboration. There are also issues with the workforce of the field in addition to the science; the Committee will examine how to keep a lab like Fermilab going while progressing on the broader science goals.

The meeting at Fermilab will include an open microphone session organized by the APS/DPF Executive Committee. The Committee is interested in opinions
on the charges as well as personal contact through letters, which will be distributed among committee members and discussed. Thus far, we have received four letters. The UEC can help by sending an email to the Fermilab
community
asking for input.

In order to address broader science issues, we are making use of the committee membership. For example, one subgroup of the committee is looking
into how
experimental particle physics can serve as a steward for the accelerator

science that is critical for many areas or research. At the Cornell meeting, the committee will investigate connections between other branches of sciences and particle physics. Another interesting question is the role particle physics plays as a "first attractor" for young people to the sciences, regardless of whether they stay in the field or not.

The goal of the Washington meeting in December is to finish the writing of the committee report. Currently, we are projecting a document of about 100 pages.

The Fermilab Particle Astrophysics Center: Brenna Flaugher

Status of the Field:
One of the most exciting questions in science today is the nature of the dark matter and energy we observe in the universe, which we believe comprise approximately 30% and ~70% of the universe, respectively. The explanation of dark energy is a completely open question, while dark matter may have an explanation in terms of elementary particles. These particles, however, have yet to be detected in any laboratory. Surveys of the cosmic microwave background (CMB) provide the "oldest" snapshot of the universe (z~1000), revealing density fluctuations, which with dark matter and energy, govern how the structures of galaxies we see today were formed. At redshifts out to z=0.3, the Sloan Digital Sky Survey (SDSS) sees the filamentary structure of the universe.  At z ~ 0.7, the universe transitioned from a dark matter dominant to a dark energy dominated universe.

In the equation describing the evolution of the universe in terms of the dark matter and energy, w governs the evolution of dark energy density with redshift; w=-1 would correspond to a cosmological constant. Currently the error on w is about 0.15, with w <-0.76 at 95% confidence level.

In addition to the scientific questions connecting particle physics and cosmology, techniques are also sometimes related. For example, in the algorithm used to determine the mass of a cluster of galaxies is similar to the jet clustering algorithms used in collider physics.

The Theoretical Astrophysics Group:
The Theoretical Astrophysics Group was founded in 1983 by Lederman and

Schramm, whereupon Rocky Kolb and Mike Turner were hired to lead the group.
Currently, there are about 10-15 scientists in the group, with 4 permanent staff, 5 post docs and visiting scientists. Many of the members hold joint appointments with universities. Among the many areas of research the group is involved in are:

1. Cosmological constraints on neutrino mass
2. Models of dark energy and ways to detect it
3. Inflation
4. Dark Matter
5. Gravitational lensing
6. Strings

The group has published more than 1000 papers since its inception.

The Sloan Digital Sky Survey (Fermilab E885)
Fermilab has been involved in SDSS since 1990, when the Fermilab Director received a request to join the project. This marked the start of the Experimental Astrophysics Group at Fermilab. The experiment measures redshifts of galaxies and has obtained spectra of approximately one million galaxies and one hundred thousand quasars in a map covering 1/4 of the sky. The experiment centers around a 2.5 m telescope with a 120 Megapixel CCD camera and a 640 fiber spectrograph located in New Mexico. The dataset is open to the public, with approximately half of the publications on the data coming from non-collaborators

The Pierre Auger Project:
Fermilab has been involved with the Pierre Auger project since 1994. A year-long workshop at Fermilab ensued, after which a full design was produced. The project was proposed to the URA Board of Overseers and the Trustees at which point it became a URA project. The goal of the project is to observe the highest energy cosmic rays (>10^{19} eV) by using a large array of Cherenkov detectors and fluorescence telescopes in Argentina. The project has 13 participating countries, with about 25% of the support coming from the United States through the Department of Energy and the NSF.

The Cryogenic Dark Matter Search (CDMS):
In 1995, Sadoulet (co-spokesman of CDMS) was searching for a deep underground site for CDMS detectors. The Soudan mine was determined to be appropriate, at which point Fermilab joined the project by providing infrastructure, the

data acquisition and project management. Currently, the array of detectors in the mine have achieved dark matter limits four times more sensitive than any other experiment.

New Initiatives:
Starting in 2002, three new initiatives have been proposed to the Fermilab Physics Advisory Committee:

1: SNAP (Supernova Acceleration Probe), a potential candidate for the DOE/NASA Joint Dark Energy Mission (JDEM). Fermilab was admitted to the collaboration in 2002

2: SDSS extension: Proposed and approved by the PAC in 2004, with funding from other sources. Funding has been approved from NSF.

3: Dark Energy Survey: Proposed in 2003 and granted Stage I approval. Fermilab will lead construction of the camera and optics. This study will survey 300 million galaxies in order to determine w to 5%.

The Fermilab Particle Astrophysics Center:

The Center was formed in January 2005 to bring together and focus the resources of the Fermilab astrophysics community and to provide a framework for future efforts. The center occupies the 6th and 7th floors of Wilson Hall West. The Director of the Center, Rocky Kolb, who reports directly to the Fermilab Director, is advised by a steering committee composed of the head of the projects. The Fermilab Director in turn has a visiting committee of advisers. The Center is interdivisional, in that all Fermilab divisions are involved in one or more of the projects.

In conclusion, the Fermilab Particle Astrophysics Center provides an organizing structure for Fermilab's astrophysics during a very exciting time in cosmology. The center will strengthen ties to Users. Meanwhile, fundamental questions about the nature of dark matter and energy will be attacked from both cosmology and accelerators, often employing similar techniques in analyzing the data.

Washington, D.C. Trip Post Mortem: Erik Gottschalk
We visited between 126 and 130 offices during the trips. We are in the process of thanking the House and Senate offices for the appointments and requesting the members to sign the House letter sponsored by Representatives Biggert, Schiff, and Tauscher and the Senate letter sponsored by Senators Alexander and Bingaman supporting the Department of

Energy's
Office of Science. The House letter arose directly as a result of an appointment with Representative Schiff.

GSA Report: Catherine Kopic
The GSA is currently organizing the New Perspectives Conference. We should
have a website for the conference ready soon.