Minutes of the Fermilab UEC Meeting
May 10, 2013

Attending:
Mary Anne Cummings, Craig Group, Daniel Kaplan, Sergo Jindariani, Breese Quinn (remote), Lee Roberts, Mandy Rominsky, Gregory Snow (remote), Nikos Varelas, Bob Zwaska *(Not Present: Ryan Patterson, Greg Pawloski)*
FSPA: Leo Aliaga, Carrie McGivern
Guests: Barb Book, Kaitlin Chell (remote), Stephen Holmes, Young-Kee Kim (remote), Pier Oddone (remote), Bob Tschirhart

Presentations
https://indico.fnal.gov/conferenceDisplay.py?confId=6829

Chair's Report – Nikos Varelas
The UEC will need to elect six new members this year. Last year there were 18 nominations, which was considered to be a large number. Nominations can be made by the UEC or by written petitions.

Nikos submitted testimony to the Senate Energy and Water Development Appropriations Subcommittee on behalf of the UEC. The APS DPF Executive Committee also submitted a letter supporting the UEC testimony to the Subcommittee.

The National Users Facility Organization (NUFO) http://www.nufo.org/ will have its congressional exhibition on June 26. It is organized by the House Science & National Labs Caucus. Two additional users organization representatives will accompany Nikos. There will be an additional meeting with the Illinois congressional delegation on June 25 organized by ISTC (Illinois Science & Technology Coalition http://istcoalition.org/). Nikos will participate at a panel discussion.

News from Washington – Kaitlin Chell (Lewis-Burke Associates)
Developments have been sparse since the release of the President's Budget Request for FY14 (PBR14). Congressional committees have started their deliberations, but no serious action has taken place. A programmatic request for an increase of $25M in the DOE HEP budget, led by Bill Foster and Randy Hultgren, was submitted to the House Energy-Water Appropriations Subcommittee. A similar request was submitted to the Senate E/W Subcommittee.

Expectations are low for full congressional consideration and passage of FY14 appropriations bills. Another year-long continuing resolution (CR) might be expected. The FY14 request is not spectacular, but it does include an important infrastructure upgrade and the level may be raised by the above-mentioned programmatic request.

Kaitlin suggested following up with appropriators' offices to encourage them to support

the programmatic requests. This is particularly important for Senate appropriators who have not yet reached the deadline for individual requests.

Ernest Moniz is expected to be voted on soon by the Senate for confirmation as Department of Energy Secretary. Widespread support is expected, but a hold is presently in place on the vote.

Users Meeting – Nikos Varelas
The Users Meeting will be held on Wednesday-Thursday, June 12-13. So far, there have been 135 registrants. That number is considered respectable given that is a month out from the meeting.

All invitations have been sent and some names have already been confirmed. Several groups have expressed interest in having more time allocated to them. It is quite difficult to accommodate those requests since the agenda is completely full.

At the end of the Users Meeting there will be a symposium celebrating the directorship of Pier Oddone. The program for the symposium is almost done. A reception will follow (in addition to the banquet on the first day).

An extensive task list was presented to address all the details of the meeting. Names were attached wherever possible.

Greg is compiling the list of PhD recipients for 2012 that will be included in the Users Meeting brochure.

Outreach Subcommittee – Mandy Rominsky
Student profiles are being prepared to be included in Fermilab Today. Nikos noted that the student profiles should link to the corresponding university profiles whenever these exist.

Mandy and Breese are preparing a document on the economic impact of HEP.

Quality of Life and non-US Users Subcommittee – Sergo Jindariani
A presentation on career options for graduate students and postdocs is being prepared for July or August. Several outside speakers will comment on various career trajectories in addition to the conventional academic route.

The job fair with Argonne is still being discussed. The case has been made that Fermilab can be accessed much more easily than Argonne. As Sergo's term with UEC ends in August, a replacement organizer will be needed, though Sergo will continue in some capacity even after leaving the UEC.

Status of Project X – Stephen Holmes, Bob Tschirhart
Project X is a multi-megawatt high-energy proton accelerator to support a variety of Intensity Frontier experiments at Fermilab. The research program includes both Intensity

Frontier and non-HEP science. Upon completion Project X would provide at total beam power of 6 MW at energies ranging from 233 MeV to 120 GeV on the Fermilab site. Steve gave an overview of the accelerator facility and its process.

The centerpiece of the project is a superconducting linear accelerator producing a continuous (CW) 1 mA beam of protons. At its first stage, the 1 mA beam will be at 1 GeV and will produce 1 MW of power for 1-GeV experiments, as well as inject into the Booster increasing the beam power in the remainder of the complex by at least 50% (at 8 & 120 GeV). The 1-GeV experiments include an upgraded Mu2e, EDM, and others.

The next stage would produce a 3 GeV, 3 MW beam that will support high-power muon and Kaon experiments. A third stage will replace the Booster with a pulsed Linac taking the beam to 8 GeV for injection into the Recycler/Main Injector complex, producing at least 2 MW at 120 GeV, in addition to the 3 MW at lower powers.

This staging approach is motivated by cost. Project X is in a pre-CD0 R&D state. R&D for this project is supported reasonably well and a FY18 construction start is planned.

Project X was evaluated by the HEPAP facilities panel and was determined to be absolutely central to the future of HEP. Project X is being developed with substantial outside collaboration, including a major potential in-kind contribution from India. An agreement is being negotiated between DOE and the appropriate Indian agency.

The unique capability of Project X is to run high-power to multiple fixed-target experiments simultaneously, while not having to use the technique of slow-extraction from synchrotrons. Slow-extraction for fixed-target experiments is challenging at high beam power. The modern J-PARC facility presently produces about 20 kW of 30 GeV beam, and is likely to be limited to 100 kW in the future. Furthermore, operation in this mode precludes other delivery of different beam structures to different experiments. Project X, on the other hand, uses RF electromagnetic separation of the CW Linac beam, which is not limited in beam power capability. It is also specifically designed to service multiple experiments simultaneously. This approach has been used at TJNAF.

Nikos asked about the breadth of Intensity Frontier experiments using Project X. Bob T pointed out that, worldwide, there is quite a variety of Intensity Frontier experiments. It is only in the US that Intensity Frontier experiments have been limited to neutrinos and now muons. Additionally, the Intensity Frontier pre-Snowmass workshop summary highlighted Project X as an enabler in each of the six subsections.

Sergo asked how younger scientists could become involved considering that the timescales are so long. Bob T responded that we could continue the tradition of coupling students to operating experiments and R&D to get results while also working on opportunities for the future. He also commented that in some places, notably Europe, PhDs can be earned more easily on development only.

Craig asked about the number of PhDs that might be expected annually from this

program. Bob T responded that individual experiments will be smaller than collider experiments, but will not be single measurement experiments in any way. Also there will be many more experiments that are developed on shorter timescales.

Bob T presented a new web site intended to increase user involvement in the Project X program http://projectx.fnal.gov/ . The site includes information about Project X and the physics opportunities. Bob T and Steve are looking for ways to involve the Fermilab Users Committee.

Status of g-2 – Lee Roberts

The g-2 experiment at Fermilab will measure the anomalous magnetic moment of the muon. Lee presented the history of g-2 and the plans for the Fermilab experiment.

The magnetic moment of the muon (and electron) is only slightly greater than twice the spin. The "slight" portion is known as the anomalous portion and is directly derived from higher order corrections in quantum field theory. Because of its couplings (and the possibility of precise experiments) it has great promise for insight into new physics.

Theoretical predictions of the anomalous magnetic moment of the muon are exquisitely precise. They are only testable with very precise experiments. The remaining standard model uncertainty comes from higher-order hadronic corrections. Supersymmetry is a strong candidate to impact the g-2 factor.

The experimental technique is to measure the decays of polarized muons and observe the rotation of that polarization. The polarized muons are injected into a uniform magnetic field that allows the polarization to rotate at a rate proportional to the anomalous moment. Electrostatic focusing must be used to maintain the uniform magnetic field. The precession frequency can be measured with high precision and fit to extract the frequency.

The ring consists of monolithic 50' diameter superconducting magnet coils and precisely machined yoke steel. Field is measured and shimmed to the ppm level. The ring was built at BNL and operated for many years off the AGS. The experiment is now being disassembled and relocated to Fermilab. The first yoke pieces were delivered to Fermilab on May 8.

The superconducting coil cannot be disassembled. It will be transported by barge from Long Island, south to New Orleans, and up the Mississippi and Illinois rivers to Lemont IL. It will be transported by truck in both New York and Illinois. The highways will be closed for short periods to allow this. The coil is expected to arrive at Fermilab in late July.

g-2 was the only new start in HEP for FY13. Young-Kee explained that under a continuing resolution, there are typically no new projects allowed to start construction. An exception was made for g-2 so it would not fall too far behind.

Long-term plan is to power the magnet by 2015 and take data by 2016.

The g-2 has about 100 collaborators. A few students have started, but active recruitment is starting now for new students for whom the timescale would work well.

News from the Directorate – Pier Oddone, Young-Kee Kim
Pier reported that the Lab is presently moving along reasonably smoothly. The groundbreaking for the Muon Campus occurred recently. Pier is working to restore funding to LBNE in the appropriations bills. He reports that support for the bills in both bodies of Congress looks challenging, particularly in the House. Still, we may expect another continuing resolution for next year.

NOvA seems to be approaching a good finish. It looks like it would be the third major project in a row that finished on schedule and within budget without re-base-lining. Effort is being taken to ensure that it is completed as soon as possible. The only expected outstanding risk is the price of oil, which has been stable in recent times.

The g-2 is in motion now with the start of the building and the ring being moved. This is a very good sign that the project will continue with minimal interruption.

Accelerators are expected to return to operation in the middle of June. Work in the tunnel is going well, but the flooding from recent rains will cause a 1-2 week delay.

Project X is progressing, particularly in terms of the Indian collaboration for which it is hoped that there will be an agreement during this summer.

For the FY13 budget, a reprogramming of remaining budget has been requested to maintain the program as much as possible. OMB is reviewing it now.

Young-Kee described a campus master plan that has been developed for Fermilab. With recent construction, a need was realized for a master plan for future work at Fermilab. A plan was developed with a team of architects about the future for buildings and experimental infrastructure at Fermilab. Included in this plan is consolidation of some very old infrastructure into new locations. Some parts of this plan have been released and a final report is expected at the end of June. There was some discussion about architectural features in Wilson Hall.

Next UEC meeting: June 14 8:30 – noon, Black Hole WH2NW

Scribe: Bob Zwaska