



## Minutes of the Fermilab UEC Meeting on November 17, 2011

### Attending:

Todd Adams, Mike Cooke, Dick Gustafson, Sergo Jindariani, Dan Kaplan, Jonathan Lewis, Ryan Patterson (remote), Brian Rebel, Nikos Varelas, Lisa Whitehead, Bob Zwaska

GSA officers: Gene Kafka, Brian Tice

### Guests:

Pier Oddone, Carol McGuire (remote), Bob Kephart

### **News from the Directorate - Pier Oddone**

Q about Pier's visit to concluding session of leadership program conducted by U. of Chicago (where various working groups developed presentations to policy makers on supporting science) about presentation on "selling" HEP and national labs.

A: Recommends Roser's presentation, whose theme was "The Pursuit of Next." The phrase can be connected to previous research and results. It can support the national labs as well as science in general. Obama administration used "Winning the Future." APS focus groups found that phrase didn't work. What did we lose? Catch-phrases can be powerful. What allowed the next big thing in the past was basic research. Will ask presenters to discuss with community advisory group as a test of this concept.

Q: Should pamphlet for DC trip be FNAL-focused?

A: While we should plug the Lab, we should build the case for basic science. Perhaps the Lab should be more featured.

Q: Is Lab subject to Tea Party "knife"?

A: Not clear what anybody means by abolishing DOE. What would they do with all the programs? Not clear how they feel about Office of Science. NIH and NSF get treated pretty well. Should be able to make the case not to do significant harm to national labs. DOE IG report says there is waste in DOE. Perhaps will have recommendation to close programs with overlap. Fermilab has distinct footprint - that helps. Seems unlikely that US would completely abandon HEP.

Q: Where do new starts fall with current budget situation?

A: Mu2e and MicroBooNE in Senate bill, but LBNE not. House has all of them. Issues have been explained to Senate about needs. Money may be restored but perhaps not as project money. Has been good response from staff and members.

Have made decision on LBNE beam configuration. Will go up and then down to limit depth of beam and near detector. Cut and cover for target hall. Need detector technology decision. That is ongoing in the collaboration. Choices: Water deep, LAr deep, LAr shallow. Prices not that different. Aiming to decide this December and CD-1 middle of

next year. If LBNE deep, need to develop shafts, etc. for deep underground lab. If shallow, can't do all the physics. Decision for going deep is coupled to decision to build deep underground lab which would also do dark matter, double beta decay, etc.

Q: Who would manage deep lab if built?

A: There are options. Could be Fermilab West. But has been lots of work from Berkeley, who want to stay involved in development of site. They could possibly run the facility. South Dakota may also continue to run the facility. Flexible on issue of who runs facility. Would help to have wide support within the field.

Q: Is this (FNAL-Homestake) the correct baseline?

A: 2400km helps with mass hierarchy, but no better for CP. 1300km a good compromise.

Q: What is priority for LBNE vs. Project X?

A: Some tension between the two. Hard to support two projects at once. FNAL trying to develop LBNE first. Project X has stronger case when LBNE already there and PX is providing beam for both the neutrino and flavor programs. Neutrino community is organized and would go away if we did PX first. Committed to PX. Set up necessary infrastructure for SRF, so we'll be ready to go when we can get the money.

Q: Given the long time to build LBNE, when would we be able to start PX?

A: Confident that when we are ready, if the country's mood is to support science, will be able to convince the funders.

Q: What about LAr detector at Ash River with PX to provide beam upgrade?

A: Can't get to CP violation with that baseline. That would give up on a deep underground lab.

Q: What happens to FNAL LAr program if LBNE is H<sub>2</sub>O?

A: Would consider pursuing LAr short baseline experiments. Can do LAr near surface at Sanford Lab.

### **News from the Chair - Dan Kaplan**

Meeting Dates: Next meeting Dec. 15, will post Doodle poll for following ones.

Reminder about Intensity Frontier Workshop. They have 512 registrants (>=100 from Fermilab) for a room that fits 500. Would like to see remote connections.

Antiproton workshop tomorrow at Fermilab.

APS Topical Group on Hadron Physics planning thesis award. We will ask FRA to support at the level of \$3k for an endowment (BNL and JSA each contributed \$3k).

Last meeting, Katie Yurkowitz asked for recent applications of detectors to medicine, technology, etc. Also, wants images and content for brochures.

Tracking "alumni": Amanda Thompson will provide list of PhDs by expt since 2000. Dan will work with Program planning to send to expt spokespersons. Parallel effort in DPF. They are looking for money from DOE and NSF for programmer for software to develop database. Bob recommends Razor's Edge, used by non-profits to track people.

### **Subcommittee Reports**

Outreach Subcommittee - Michael (with slides from Nikos)

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Brainstorming session. Lab has classroom presentations. Committee suggests "wrapping" this program so that it could be done by university groups in their own communities. Includes kits+videos. Materials at all levels K-12. Could also try to make local impact greater. We can help increase volunteers and requests. Suggestion that information for volunteers is hard to find. We could help with that.

Another idea: get articles published, e.g. in alumni magazines from users' universities.

There is well-established CMS & Atlas outreach. There are videos available from VMS. We could do more.

There will be a Tevatron photo album for the 2012 Tevatron Symposium.

Quality of Life - Michael

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Discussed on- and off-site transportation with Bruce Chrisman and Dave Carlson. Will have extra taxi run at 5:15 on Wed. and Fri. with fixed route to help people attend Colloquium and Wine and Cheese. Negotiating with drivers' union about off-site taxi support after hours.

Discussed centralized carpool organization and support with Fermilab Environmental Protection Subcommittee.

Career Fair: Argonne had one on 10/28. It was their first. Had industry reps come to a symposium the previous day. Michael attended, met with Postdoc Programs Coordinator. They are interested in a joint program with FNAL. Will meet with Argonne people in December. General sense of UEC to try to get our people to attend Argonne fair next year. Date has been selected. It will help to use personal connections to get more industry reps to come to the meeting. There is materials science focus - need to help to expand that.

Non-U.S. Users

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- No meeting yet.

Govt. Relations - Brian

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Had organizational meeting. People took jobs for organization of DC trip. Discussion of what should go in one-pager. Conclusion: the "ask" should be general for HEP.

## Users Meeting - Lisa

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Lisa now on planning committee for Tevatron symposium. Subcommittee agreed we don't want to change anything about Users' Meeting. Tevatron Symposium will be day before Users' Meeting. Plan: Monday for Tevatron, Tuesday and Wednesday for Users Meeting, Thursday for New Perspectives. Generally happy with caterer, keep them if possible. Also discussed promoting posters with GSA and looking to get money for student travel.

## Special Guest - Bob Kephart: SRF at FNAL

SRF is enabling technology in same way SC magnets were for Tevatron. SRF cavities have gone in past 1-2 decades from lab novelty to the choice for all new machines for converting wall power to beam power. SRF ~10x more efficient than copper cavities (~25%). Tesla is 23 MV/m. CEBAF was 5 MV/m. ILC plan is 35MV/m. SNS is first proton linac with SRF. Project X is 5 MW of beam power.

Cavities are pure niobium. Nb has highest Tc of all metals. Can make it very pure in oven. In AC device, all current on surface, so need to avoid defects of micron scale in surface and need to keep clean. Can produce cavities with  $Q \sim 1e10$ .

FNAL was involved early as part of Tesla collaboration. Participated in TTF and built similar facility with A0 photoinjector, a user facility for R&D. With 2006 ILC cold-technology decision, Fermilab effort ramped up. Joint facility at ANL for producing and polishing cavities. Built vertical test facility for bare cavities at Industrial Building. Other test facilities at Meson. Horizontal test facility for fully dressed cavities. At NML installing two satellite refrigerators to have complete beamline with 31MV/m cryomodule. Plan to accelerate beam through up to 6 such cryomodules, giving 1.5 GeV accelerator. Besides test facility, could be user facility for a variety of uses.

Project X needs 5 other cavity types besides ILC cavities. Total SRF effort at FNAL 110 FTEs. \$53M of M&S from stimulus in 2009 used to build out NML and buy cryomodules. Have fully qualified cavity vendor. Two other industry groups getting involved. Built cryomodule test facility next to NML with stimulus money, including 500kW refrigerator. Will be able to test all PX cavities there. Also building Pixie (Project X Injector Experiment). PX will have SRF starting at 2 MeV right after the RFQ. Building mock-up of first 30 MeV of PX next to NML test facility.

## Lewis Burke Report - Carol McGuire

CR expires 11/18 at midnight. Appropriators did not want to do omnibus - doing several "minibus" bills. First one taken up today for many departments. Also includes CR for rest of budget through 12/16. Second minibus bill on the floor, with energy and water, State Dept. and a few others. Not moving because of policy issues. Can't move even with E&W as standalone. Big issues: Yucca Mountain, DOE Loan Guarantee problem loan to Solyndra. Congress looks to move on Defense before E&W. E&W may end up part of Omnibus for remaining 9 departments. DOE Undersec. for Science Koonin leaving tomorrow. Undersec. for Energy spot vacant for a while. Brinkman pretty much it below Chu. HEP budget looks to be at freeze level. All negotiations behind closed

doors. Rep. Hultgren talked to chair of Appropriations to support President's budget for HEP. Congress asking Office of Science to set priorities. EERE did so. Will make it difficult to promote projects. Message that there needs to be balance in the program. Republicans supportive of federal role in basic research. Office of Science seen favorably. Question is how to allocate money within that. Science agencies faring better than other parts of budget, e.g. increase to NSF. Pres. asked for \$600M increase to OSci above FY11. Administration has rolled out new programs without putting them in the budget. Agencies must grapple with how to fund them. Administration made good case for science, but budget realities make funding increase hard. Significant differences between House and Senate going into negotiation. Numbers now higher after debt limit bill in August. House has president's request for HEP which had a small increase. Carole hopeful we can keep that number. Supercommittee should not impact this year's appropriation - focusing on entitlements and taxes. If no supercommittee agreement, there would be across-the-board cut in January 2013.

March OK for the DC trip.

Next UEC meeting: December 15, 2011 in the afternoon

Scribe: Jonathan Lewis