



Program Planning Beyond P5

Presentation to HEPAP
March 13, 2012

Dr. Jim Siegrist, Associate Director
Office of High Energy Physics
Office of Science, U.S. Department of Energy



Homework Assignments

- **Homework for labs**
- **Homework for the community**



HEP Lab Expectations

- **Fermilab** is the HEP main laboratory. Our first priority is to increase our research capability investment at FNAL to support our future intensity frontier program, while keeping all 3 frontiers in balance. Fermilab must concentrate efforts in this area, and the rest of the community needs to support that mission where appropriate (including the other labs)
- **The other lab groups**, in addition to bringing their unique expertise to the program, need to serve as ‘portals’ to other programs in the Office of Science.
 - Interact with & use material science, computing, nano scale, etc. in order to enable new technologies for use by HEP
 - Transfer HEP expertise to other fields in detector & accelerator technology mostly, but keep alert for opportunities elsewhere (eg. Computational science, some theory areas, etc.)
 - Continue connections & collaboration with/resource for universities as has historically been the case.
- **Fermilab can do this directly on large projects, or collaborate with the other labs...**

Our goal is to increase connections to SC programs to help stabilize our budget



Community Assistance in Program Development

- **We need to continue to develop the science case and planned program on all 3 frontiers. We need more projects in the pipeline than we have budget to be certain the funding directed out of the program onto construction will not be lost.**
- **Plan for ‘Snowmass’ in summer 2013 to assess our program (neutrino and LHC results available for guidance)**
- **We need active participation of our community in the development of the science case, with lab leadership in the background. DOE and NSF agree on this approach.**
 - This is an inversion of the “traditional” HEP modus operandi
 - The HEP community needs to own the science case, and sell the science case
- **For the intensity frontier, DOE/NSF plan to work with DPF to continue the development of the science case started at the December workshop.**
 - FNAL will lead work on research infrastructure improvements to support that science case.
- **For the energy frontier, DPF could do the same, or the LHC users organization.**
 - Less time-critical than the intensity frontier, but discoveries at LHC could change this rapidly. Your thoughts are welcome.
- **For the cosmic frontier, HEP is less clear how to proceed.**
 - Solicitations for 2nd Generation Direct Dark Matter detection in place
 - Work is needed to further develop other parts of the program, especially in dark energy.



Energy Frontier Issues

- **LHC**
 - Developing CD-0 for near-term detector upgrades
 - **U.S. participation in the large planned upgrades later in the decade are not a sure thing. We will need to develop our plans carefully, and lay the appropriate foundation to request participation in the intensity upgrade of the machine.**
- **ILC**
 - We will keep a VERY low-level GDE involvement while we wait to see if another region will press forward with a project.
 - **The physics case for this (Higgs factory?) will need to be developed and sold to the community.**
 - Participation decision is most likely (way)above all our pay grades.
- **MAP**
 - Concentrate on near-term deliverables in all our communications
- **Lab Research Review this summer (week of July 30, tentative)**



Intensity Frontier Issues

- **Science case development – see IF workshop talks yesterday**
 - Continued community engagement a must
 - Theorists need to engage in development of the program here
- **Generally, need more protons on target at FNAL to support the intensity frontier program.**
 - FNAL looking at options here
- **Program internationalization**
 - International contributions to our intensity frontier efforts will help stabilize our program

Cosmic Frontier Issues

- **HEP Community needs to decide what physics it wants to do on the cosmic frontier**
 - Beyond “build my project”
 - Beyond the mantra of Dark Matter, Dark Energy, and everything else
- **Then take that science plan to other communities and other agencies and look for a “fit”**
 - Maintaining HEP priorities and operating principles, i.e.:
 - We do experiments!
 - Lower-cost and faster options welcome



Beyond P5

- **The P5 Framework is a solid foundation, but**
 - Some of the recommendations have been overtaken by events
 - Budgets have generally been on the lower end of plans
- **We do NOT want to give up that foundation or “re-open” project prioritization at this time**
- **Instead we want to evolve and strengthen the P5 plan**
 - From a better understanding of the science opportunities
 - Using new and improved input data
 - Including the current budget environment
- **We believe this is crucial for a successful Snowmass meeting and the future US HEP program**
 - Community leadership in developing the science plan is more important than ever.
 - When DPF calls, the funding agencies will respond

