

HEPAP Activities - II

HEPAP Meeting

Gaithersburg, MD; December 8-9, 2014

Andrew J. Lankford

HEPAP Chair

University of California, Irvine

HEPAP Activities

Conferences

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Next steps (from Sept meeting)

Recap: Addressing the subject of conferences requires community input.

APS-DPF is an appropriate body to collect community input.

Ian Shipsey (DPF Chair) and I discussed this subject, arriving at a concept along the following lines:

1. DPF designs and executes a survey to gather community input
 - In consultation with DPB.
2. DPF reports results of survey to HEPAP, along with any conclusions.
3. HEPAP discusses subject, based on findings of survey and conclusions of DPF, and then advises agencies accordingly.

Ian has agreed to discuss this subject and concept with DPF Chairline and Executive Committee.

PLEASE SEND SUGGESTIONS REGARDING SURVEY CONTENT & SURVEY USE TO IAN SHIPSEY & ANDY LANKFORD.

Conferences

Update

Ian Shipsey (DPF Chair) discussed this subject with DPF EC.

DPF EC chose not to participate as outlined, *i.e.*, executing survey to gather community input.

DOE HEP continues to seek HEPAP input on subject of conference travel.

HEPAP needs to define steps to be taken to put discussion by HEPAP or subcommittee on a sound basis.

**PLEASE SEND SUGGESTIONS REGARDING SURVEY
CONTENT & SURVEY USE TO IAN SHIPSEY & ANDY
LANKFORD.**

HEPAP Activities

Future subcommittee laboratory & university roles

HEPAP Meeting

Bethesda, MD; May 23, 2013

Andrew J. Lankford

HEPAP Chair

University of California, Irvine

Future subcommittee on laboratory & university roles

**Concept was outlined at HEPAP March meeting.
The concept is still in development.**

Connections with HEPAP-P5 report:

- **Related to discussion and recommendations concerning the research program. Potentially provide information or advise to agencies.**

The remaining slides with this heading are from my presentation on HEPAP Activities and are included here for background reference.

Approaching the subject of laboratory & university roles

- **HEPAP discussed the formation of a subpanel or subcommittee to consider the respective roles of laboratory & university groups in the execution of the HEP program.**
 - Arising from topics such as university infrastructure, senior scientists, Theory Panel Report, differences in costs
- **CoV recommended an examination of the balance between the laboratory & university research programs.**
- **An approach:**
 - **Start discussion in the context of agency (DOE & NSF) missions**
 - What are the missions of the agencies?
 - How do labs, and how do universities contribute to agency missions?
 - What are “missions” of labs and of uni’s in this context?
 - What can agencies do to enable labs and uni’s to fulfill their “missions”?
 - **Focus on: How to best accomplish science goals in this context?**
 - **What are respective roles of the various types of institutions in accomplishing the program’s science goals, and in satisfying the missions of the program?**
 - **How can roles and working relationships be defined (or redefined) so as to optimize science accomplishment and to satisfy missions?**

Laboratory & university roles - 2

- **Bear in mind:**
 - **DOE & NSF missions differ**
- **Consider:**
 - **How does DOE mission differ for Fermilab & multi-purpose labs?**
 - **How do mission or goals differ for large and small universities?**
- **How do respective roles vary in experimental areas as experiments progress stage by stage from detector R&D through construction to physics analysis?**
- **How do respective roles vary in different areas of theory?**
- **How can roles be designed such that there are no 2nd class citizens?**
- **What degree of “academic freedom” should there be: in theory? in experiment? at universities? at labs?**
 - **What degree of mobility should there be within the field? to neighboring fields? (forays?)**

Update

In presence of P5 and other HEPAP activities, only modest further progress has been made on formulating the concept and charge.

- **I believe that this subpanel, once well conceived, can have a very positive impact on research in our field.**

This subpanel will be addressing difficult and controversial issues.

- **It must conduct its activity in a thoughtful and collegial manner.**
- **Recall its purpose is to optimize the scientific capabilities of our field.**
 - **Not to serve (or please) any single sub-community**
- **Needs a balanced composition**
 - **Institution type** (Lab/Univ; Single/multi-purpose; big/small)
 - **Subfield** (Theory/experiment; frontier)
 - **Sponsoring agency** (DOE & NSF)
- **Expect to receive a formal charge**

Progress on Concept for
National Scientific Program
Advisory Subpanel

HEPAP

Gaithersburg, MD; September 29-30, 2014

Andrew J. Lankford

HEPAP Chair

University of California, Irvine

NSPAsP Concept

Goal: Effective and transparent mechanism for HEPAP to advise DOE on the selection of particle physics projects for the national HEP portfolio.

Context:

- P5 process performed strategic planning.
 - P5 set the overall goals and priorities of the national program.
 - For large/medium project concepts, P5 recommendations can provide a basis for “mission need”, CD-0 approval
- DOE CD process performs technical review of projects that are part of national portfolio.
- Project concepts often require additional evaluation of scientific & technical issues before being added to national portfolio.

A sample case:

- How does a concept for a small project, too small to be considered individually by P5, gain approval to become a project?

Concept:

- A HEPAP subpanel provides scientific advice regarding project concepts, following scientific & technical review and evaluation of whether concept is aligned with the P5 strategic plan and considering P5 selection criteria.

NSPAsP Concept – Moving Forward

Concept needs further refinement:

- **Interplay & interactions of NSPAsP & Fermilab PAC**
- **Also:**
 - **Role in interagency projects or initiatives**
 - **Possible role in review of projects previously recommended by P5 that experience significant changes in cost or schedule**

Formal charge needs to be developed.

Meanwhile, national short-baseline program needs initial definition.

Undertake initial definition of national short-baseline program as “pilot project” by HEPAP subpanel constituted of subcommittees of PAC and HEPAP.

Note: Fermilab PAC has been discussing short-baseline neutrino program since early 2014. It targets proposal(s) for Jan. 2015. Fermilab-based experiments should not be unnecessarily delayed.

Summary - 1

A National Scientific Program Advisory sub-Panel of HEPAP can:

- **Provide an effective and transparent mechanism for HEPAP to advise DOE on the selection of particle physics projects for the national HEP portfolio.**
 - **Following scientific and technical review and evaluation of whether project concept is aligned w/ P5 strategic plan and considering P5 selection criteria.**
- **Address the recommendations of P5 regarding:**
 - **Small project portfolio**
 - **Short-baseline portfolio**
 - **Project reassessment (if costs and/or capabilities change substantively)**
- **Give guidance to DOE *wrt* appropriateness of CD-0 approval of projects.**

NSPAsP would be somewhat similar to Fermilab PAC, but at national level.

- **Main similarity is scientific review. Several differences in mission and operation.**
- **Interplay of NSPAsP and F-PAC needs better definition.**

Summary - 2

National short-baseline neutrino program needs initial definition.

- **P5 did not want to preclude either some of these experiments not using LAr or some of these experiments being sited elsewhere than Fermilab.**
- **Fermilab PAC has been developing a short-baseline program.**

**Workshop on Intermediate Neutrino Program
Feb 4-6 BNL**

Moving forward

- **Convene an int'l workshop on intermediate-term neutrino program**
- **Advice to DOE on initial program definition by HEPAP subpanel composed of members of F-PAC, members of HEPAP, and other experts.**
 - **Consider this a “pilot project” to better understand interplay of future NSPAsP and F-PAC**
 - **Settle on path forward by December HEPAP meeting.**

HEPAP Activities

Future Meetings & Topics

HEPAP Meeting

Gaithersburg, MD; December 8-9, 2014

Andrew J. Lankford

HEPAP Chair

University of California, Irvine

December 2014 Meeting

Monday-Tuesday December 8th – 9th ; Bethesda

Reports (partial list):

- **Accelerator R&D Subpanel – Preliminary report**
- **Materials by Design and Opportunities for HEP**
 - Mike Norman – ANL Materials Science Division Director
- **Particle Data Group**
- **APS Division of Particles & Fields (TBC)**

April 2015 Meeting

Tentative date: Mon-Tues April 6-7

Venue – Washington (not suburbs)

We would like to have a meeting with easy access to OMB and OSTP and other interested parties.

Timing is good considering FY2016 budget rollout, and Accelerator R&D Subpanel report.

These plans delay the start of taking 1 meeting/year outside Washington area.

Reports (partial list):

- **FY2016 budget**
- **NSF MPSAC Subcommittee on implementing P5 report**
- **Accelerator R&D Subpanel – Final report**
- **HEP connections with ASCR**
 - + other selected computing & software topics**
- **Communications**

List of Reports for Future Meetings

In addition to regular follow-up on ongoing activities, e.g.:

- Development of implementation of P5 plan
- *Etc.*

Reports (partial list):

- **APS Division of Physics of Beams**
- **CPAD**
- **Data projects**
- **Further reports on connections with other disciplines**
- **Reports from other regions (Europe, Japan, China, etc.)**

Suggestions for further topics welcome.

Discussion

Spare Slides

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- Project concepts often require additional evaluation of scientific & technical issues before being added to national portfolio.

A sample case:

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Concept:

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NSPAsP Concept – Connections with P5 Report

Three subjects of connection:

- **Small Projects Portfolio**
- **Short Baseline Portfolio**
- **Project Reassessment (if costs and/or capabilities change substantively)**

NSPAsP Concept – Connections with P5 Report

Small Projects Portfolio:

- **P5 recommended a program that included small-scale projects.**
 - *Recommendation 4: Maintain a program of projects of all scales, from the largest international projects to mid- and small-scale projects.*
- **Important small projects, whose costs were typically less than \$20M, were not individually large enough to under direct P5 review.**
- **Small projects can also include:**
 - **Small investments in large, multi-disciplinary projects**
 - **Early R&D for some project concepts**
 - **Funding for participation in experiments hosted by other agencies and other countries**
 - *Recommendation 9: Funding for participation of U.S. particle physicists in experiments hosted by other agencies and other countries is appropriate and important but should be evaluated in the context of the Drivers and the P5 Criteria and should not compromise the success of prioritized and approved particle physics experiments.*

Short Baseline Portfolio

Project Reassessment (if costs and/or capabilities change substantively)

NSPAsP Concept – Connections with P5 Report

Small Projects Portfolio

Short Baseline Portfolio

- **P5 recommended:**
 - Selection of a set of small-scale short-baseline experiments
 - Some of the experiments should use liquid argon
 - (implicitly) Some of these experiments be hosted at Fermilab
- **P5 did not want to preclude either some of these experiments not using LAr or some of these experiments being sited elsewhere than Fermilab.**
 - It enunciated possibilities for experiments with neutrinos from radioactive sources, beams, or nuclear reactors.
- **Short-baseline experiments need selection as part of a coherent national program**
- Pertinent recommendations:
 - *Recommendation 12: In collaboration with international partners, develop a coherent short- and long-baseline neutrino program hosted at Fermilab.*
 - *Recommendation 15: Select and perform in the short term a set of small-scale short-baseline experiments that can conclusively address experimental hints of physics beyond the three-neutrino paradigm. Some of these experiments should use liquid argon to advance the technology and build the international community for LBNF at FNAL.*

Project Reassessment (if costs and/or capabilities change substantively)

NSPAsP Concept – Connections with P5 Report

Small Projects Portfolio

Short Baseline Portfolio

Project Reassessment

- **P5 recommended reassessment of project priority if costs and/or capabilities change substantively.**
 - In particular for continuing compatibility with the P5 strategic plan
 - P5 did not recommend a specific mechanism.
 - *Recommendation 3: Develop a mechanism to reassess the project priority at critical decision stages if costs and/or capabilities change substantively.*
- **This issue was also raised by the HEPAP CoV for DOE HEP.**

NSPAsP Concept – Connections with P5 Report

Small Projects Portfolio

Short Baseline Portfolio

Project Reassessment (if costs and/or capabilities change substantively)

HEPAP CoV for also commented on having a more transparent / routine review process for new projects.

NSPAsP Concept & Fermilab PAC

NSPAsP would be somewhat similar to the Fermilab PAC, but at national level.

- What are the roles of NSPAsP and F-PAC in approving Fermilab-based projects?
- How would redundancy and delays in reviews be avoided?
- How can NSPAsP and F-PAC will work in concert with one another?

NSPAsP concept was presented & discussed with F-PAC in July.

- It was presented that interplay with F-PAC needs better definition and discussion was invited.

F-PAC reported: “*The PAC is very concerned that, in the case of "normal-course" review of experiments hosted at Fermilab, the relationship between a NSPAsP and the Fermilab PAC is not clear and could be potentially redundant and damaging, adding another hurdle to the timely and efficient approval of worthwhile projects.*”

NSPAsP Concept & Fermilab PAC

Without intending to make subject a major topic of HEPAP discussion today, let's look at some of the similarities and differences between NSPAsP & F-PAC.

A major similarity:

- **Both bodies perform scientific review:**
 - **Usual merit review criteria, including e.g.:**
 - **significance of scientific objectives**
 - **capability to achieve scientific objectives**
 - **potential to impact particle physics**
 - **Quality of the team**
 - **Technical approach**
 - **Cost range**

NSPAsP Concept & Fermilab PAC

A major similarity: Both bodies perform scientific review

Some differences:

F-PAC:

- Provides ongoing review. Nurtures projects from concept to success.
- Meets regularly (currently 2/yr)
- Standing committee w/ multi-year appointments & rotating membership
- Advises on Fermilab program,
 - Including impact proposed expts would have on Fermilab
- Advises Fermilab Director

NSPAsP:

- Provides review of projects proposed as ready to join US HEP portfolio. Does not provide ongoing review.
- Convened as needed.
- Subcommittee of HEPAP with add'l experts as appropriate
- Advises on national HEP program
 - Including alignment with P5 plan & considering P5 selection criteria
- Advises DOE
- FACA-compliant

F-PAC plays an irreplaceable role in nurturing development of experiments, and it can provide invaluable input on the subjects of scientific review for proposed experiments.

NSPAsP Concept – Moving Forward

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Short-Baseline, Short-term Neutrino Program

Possible Way Forward

- **Convene an international workshop on the neutrino program that will be intermediate in time between current experiments and LBNF.**
 - Emphasis on steriles, short baseline oscillations (incl reactors), R&D opportunities
 - Opportunity to accrete participation in experiments & in program
 - Opportunity to trigger (or, a prelude to) proposals
 - Workshop agency sponsored
 - Hosted by BNL with scientific advisory and local organizing committees
 - Timescale under discussion
- **Working groups such as short-baseline expts, reactor expts, R&D platforms, non-accelerator neutrinos**
 - Working groups should converge on a short **“white paper”** for each project or experiment outlining:
 - physics and/or technical goal(s)
 - timeline/next steps,and should try to tie together the experiments/platforms in a portfolio with **overarching theme(s)**.

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 - **Fermilab-based program could be brought for discussion to workshop either as an ensemble or as separate experiments.**

Agencies use white papers to inform subsequent steps

Possible DOE call for proposals (NSF open to proposals)

Advice to DOE on initial program definition by HEPAP subpanel composed of members of Fermilab PAC, members of HEPAP, and other experts.

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