

Future topics discussion

HEPAP Meeting

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Project budget fraction - 1

(See II. Overarching Issues: C. Project budget fraction)

Recommendation 11:

Further increase in the budget fraction devoted to projects is desirable but should be subject to the recommendations of the 2014 P5 report and budget constraints.

Finding:

The fraction of OHEP budget devoted to projects showed a substantial dip in the FY2006 – 2007 period to about 5%, down from about 20% before then. The 2010 COV recommended an increase in the projects fraction. By 2012, the fraction had increased to about 17%, aided in part by the infusion of the American Recovery and Reinvestment Act (ARRA) funding starting in FY2009.

Comment:

We appreciate the efforts to raise the project funding fraction. Projects represent the new opportunities that keep the field vital and address new scientific opportunities. While this COV agrees that further increase in project funding is desirable, doing so in the currently constrained budget environment will cause restrictions in other important activities, particularly research. Without guidance on possible budget scenarios, it is difficult to judge the appropriate fraction of project funding. The forthcoming P5 assessment will consider such budget scenarios and we look forward to its advice on the appropriate level of project funding in each of these scenarios.

Project budget fraction - 2

Recommendation 11:

Further increase in the budget fraction devoted to projects is desirable but should be subject to the recommendations of the 2014 P5 report and budget constraints.

- **Project fraction trades off with fractions on other budget lines:** research & facilities ops.
- **HEP has been reducing research fraction in order to increase project fraction.**
Presently Research : Projects = ~50% : ~17%
SC average projects fraction ~20% (note: not all fields same; ignores NSF role)
Research fraction <40% viewed as not healthy (anecdotal)
- **P5 licensed to play with fractions:**
The report should articulate the scientific opportunities which can and cannot be pursued and the approximate overall level of support that is needed in the HEP core research and advanced technology R&D programs to achieve these opportunities in the various scenarios.
P5 must do so wisely.
 - Research work force should match project portfolio.
 - Changes should not be made that do long-term damage to field.
- **Beyond P5, “fine tuning” wrt P5 assumptions may (is likely) to be useful.**
 - **More careful study may be needed**
 - Note: depends on lab & university budget split -> ties to other issues

Project budget fraction - 3

Recommendation 11:

Further increase in the budget fraction devoted to projects is desirable but should be subject to the recommendations of the 2014 P5 report and budget constraints.

Possible HEPAP follow-up:

Wait to see what P5 accomplishes and what it suggests as follow-up.

Lab & university roles - 1

Recommendation 18 (from I.K. Balance of university and laboratory programs):

Undertake a separate review of the balance between the Laboratory and university research programs.

Recommendation 3* (from III.1 Energy Frontier):

OHEP should have an overall strategy for some of the large issues that are communicated to the reviewers. These issues include the appropriate mix of lab and university funding levels, the role of the national labs that do not run facilities, the numbers vs. the strength of the groups supported.

Recommendation 18* (from III.1 Energy Frontier):

A future HEPAP subpanel should provide guidance on the balance of Laboratory and university programs.

Recommendation 18* (from III.3 Cosmic Frontier):

An examination of the balance between university and lab efforts should be made so as to optimize the breadth and depth of the program given current very tight budget constraints.

Lab & university roles - 2

Recommendation 18 (from I.K. Balance of university and laboratory programs):

Undertake a separate review of the balance between the Laboratory and university research programs.

Comment (from I.K. Balance of university and laboratory programs):

This COV had neither the appropriate documentation nor the time to adequately assess the balance in the program between university and laboratory research programs. The new comparative reviews in both sectors were not yet fully in place during the period reviewed. We found anecdotal evidence that the balance, at least in funding, varied among the frontiers. Similarly the balance between senior experienced scientists and junior investigators is important to strike carefully, and again some anecdotal evidence was found to indicate that this balance may be shifting towards more junior scientists. These are important topics and we look forward to their consideration in a forthcoming HEPAP subpanel.

Finding (from III.3 Cosmic Frontier):

The fraction of Cosmic Frontier direct funding at universities was reported to be about one third that at the labs.

Comments (from III.3 Cosmic Frontier):

Although this may simply reflect historical realities in the Cosmic Frontier, it should be looked at more broadly, as the period of this review has been a time of rapid transition in HEP.

Lab & university roles – 3

Recommendation 18 (from I.K. Balance of university and laboratory programs):

Undertake a separate review of the balance between the Laboratory and university research programs.

Recommendation 3 (from III.1 Energy Frontier):*

OHEP should have an overall strategy for some of the large issues that are communicated to the reviewers. These issues include the appropriate mix of lab and university funding levels, the role of the national labs that do not run facilities, the numbers vs. the strength of the groups supported.

Recommendation 18 (from III.1 Energy Frontier):*

A future HEPAP subpanel should provide guidance on the balance of Laboratory and university programs.

HEPAP has touched upon this general subject, e.g. in future topics discussion at its last meeting. HEPAP will return to it today.

Possible HEPAP follow-up:

Establish HEPAP subcommittee to address this issue in the context of other issues dealing with the respective roles of laboratories and universities in the execution of the optimal particle physics program.

Senior scientists at universities

***Recommendation 12 (from II. Overarching Issues: D. Senior Research Scientists):
Allocate a few dedicated pages in proposals for senior research scientists to describe their activities and critical accomplishments.***

***Recommendation 10* (from III.2 Intensity Frontier):
Improve the review criteria for senior scientists.***

Findings:

- The comparative review in 2012 resulted in the termination of several senior research scientists. The COV review found that these terminations were reasonably documented.
- Some senior research scientists reviewed poorly because of reviewer comments comparing their contributions to what a good postdoc could do.

Comment:

Senior research scientists often perform crucial roles in assuring the success of large long-term projects. In many cases their contributions center on technical projects, rather than physics analyses. It is important that reviews have the information needed to evaluate senior scientists in the context of their main contributions.

Possible HEPAP follow-up:

Raise this recommendation in the more general context of the discussion of senior research scientists by the HEPAP subcommittee formed to discuss respective roles of laboratories and universities.

Theory - 1

Recommendation 27 (from III.4 Theory):

Create a new theory postdoc fellowship program, with recipients chosen via national competition and supported for three years at any DOE supported university or lab group of the recipients choosing.

Finding:

Postdoctoral researchers are the lynchpin of theory research. Support and training for these young researchers is essential to current and future vitality and to the future of HEP theory. However, postdoc support is especially vulnerable to negative impacts from budget pressures.

Comments:

Special programs to recognize the most promising postdocs help develop future scientific leaders. Such programs at laboratories and some universities have been highly successful. A program that is open to the full spectrum of young theorists would be useful.

There are several successful models for postdoc fellowship programs that could be partially emulated. These include the NSF LHC-TI, NASA Hubble fellows, NIH fellows, and others.

Possible HEPAP follow-up:

Raise this recommendation in the theory discussions of the HEPAP subcommittee formed to discuss respective roles of laboratories and universities.

Theory - 2

Comment:

Separate comparative reviews for **laboratory versus university theory** is well motivated by **programmatic differences** between the two programs. The 2011 lab theory review panel and the FY12 university theory review panel had some overlap in membership. This is useful for providing some relative normalization of the theory activity in the two programs.

Possible HEPAP follow-up:

I have isolated this comment in light of the text in bold red. It would be good to identify programmatic differences between laboratory and university theory in the context of the HEPAP subcommittee formed to discuss respective roles of laboratories and universities.

SciDAC & Accelerator R&D

Finding (from III.5 Accelerator R&D):

The Scientific Discovery through Advanced Computing (SciDAC) program is managed by ASCR for computing initiatives across the Office of Science; this program contains elements relevant to accelerator R&D.

Comment:

SciDAC is a good example of how HEP benefits from a program that is jointly run with another Office of Science program office. There has been significant progress over the second and third generations of SciDAC. SciDAC accelerator code development might benefit from closer coordination with GARD, and in due course with the Accelerator Stewardship program.

There is informal coordination between SciDAC and GARD, but the desire to optimize the HEP rewards suggests the need for closer coordination and for better accounting of the needs of the code end users. The accelerator software activities within SciDAC could be reviewed to measure and ensure user satisfaction, with the assistance of OHEP.

Possible HEPAP follow-up:

- ***Is HEPAP follow-up called for here? What follow-up would be appropriate?***
- ***Does it make sense to roll this topic into the mandate of an accelerator R&D subcommittee?***

Note in passing: Principal accelerator R&D recommendation was captured in the future topics discussion on accelerator R&D.

Accelerator Stewardship

The Accelerator Stewardship program was initiated after the period of this review, so is not part of the purview of this committee. However as there were discussions with OHEP staff on this program, the COV considered some ways to enhance the prospect for its success.

Suggestions from III.5 Accelerator R&D):

- 29. Identify goals and areas of mutual and/or complementary accelerator R&D interest jointly with other parts of the Office of Science and other agencies and stakeholder in founding the Accelerator Stewardship program.*
- 30. Establish procedures to jointly review proposals addressing Accelerator Stewardship goals, including those outside traditional boundaries, at the initiation of the program.*
- 31. Review the progress of the Accelerator Stewardship program periodically (e.g. annually), reporting to OHEP, including reviewers representing other parts of the Office of Science, and representing other governmental agency stakeholders. Consider including SciDAC accelerator activities in the periodic reviews.*

Possible HEPAP follow-up:

Monitor development of stewardship program via a report at a future meeting (time scale summer 2014).

Project management by laboratories

Comment (from III.7 Projects):

The Laboratories serve as the contractors for major projects with the expectation that there will be university involvement as appropriate. It would be useful to investigate ways to facilitate enhanced contribution by universities.

Possible HEPAP follow-up:

Discuss in the context of the HEPAP subcommittee formed to discuss respective roles of laboratories and universities.

Topics arising from CoV report

DOE travel policies

Comment (from II. Overarching Issues: J. Travel restrictions for Laboratory supported personnel):

Although it is outside the purview of this COV review, we note the damaging aspect of the current travel rules for laboratory personnel and those supported on laboratory service accounts that have prevented many from attending conferences and workshops to present their research results to the wider community. The restrictions also have inhibited the ability of the laboratories to host conferences and workshops. Conferences and workshops are essential in a globally interconnected field such as HEP. They are the means by which new findings and techniques are disseminated and discussed in intensive face-to-face encounters. Constraints on US scientists' participation in conferences damage the competitiveness of the national program. **We urge continuing effort to relax these rules and the deadlines imposed in their application, consistent with appropriate concern for efficiency and budgetary responsibility.**

Possible HEPAP follow-up:

How can HEPAP and/or APS and/or the particle physics community impact this policy?

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?)**

Capturing some other topics, some from previous discussion

- **Characterize the workforce** (qualitatively, and perhaps quantitatively) **required to address the science and missions.**
 - **Can we describe how big the field needs to be?**
 - **What areas need to be expanded? What areas can be cut?**
 - **What should be the profile of the field: students, postdocs, faculty, lab scientists?**
- **Mentoring, sociology of training & workforce development**
- **Stovepiping**
 - **Within HEP**
 - **CoV has commented; what follow-up is needed?; what other issues are there?**
 - **Between HEP and other offices and agencies**
- **How should future strategic planning be done?**
- **Should there be an international planning process?**
- **How should monitoring of roadmap be done?**
- **Do we need a national PAC?**
 - **To prioritize and recommend small and medium-scale experiments?**
 - **To monitor particle physics program execution?**

Capturing some other topics - 2

What is missing?