Report of the

Committee of Visitors (COV)
Office of High Energy Physics
Department of Energy

to the
High Energy Physics Advisory Panel

Covering Fiscal Years 2007, 2008, and 2009

October 13-15, 2010

Approved by the HEPAP November 18, 2010

I. Executive summary

The 2010 Committee of Visitors met in Germantown, October 13-15, to review the operations and programs of the Office of High Energy Physics (OHEP) in the DOE Office of Science. The twenty-four panel members, listed in Appendix A, are all prominent members of the field from around the world with extensive experience in the science and operations of high energy physics. To cover the broad portolio of OHEP activities the panel was subdivided into six subpanels focussing on Accelerator-based Research, Non-accelerator-based Research. Theory, Advanced Accelerator R&D, Facility Operations, and Projects. In conformity with DOE Office of Science guidance, Chairman Mel Shochet of the High Energy Physics Advisory Panel (HEPAP) prepared a charge, reproduced in Appendix B, directing this panel to examine both procedural issues and overall success of the OHEP program. The Panel heard presentations from OHEP management and staff, and during the two and one half days interacted extensively with OHEP personnel to probe issues and understand details; Appendix C gives the agenda for the meetings. OHEP staff also provided numerous files – a primary reason for meeting in the DOE offices at Germantown – which panel members examined for procedural analysis.

The overall conclusion of this Panel is that the Office of High Energy Physics is carrying out its mission with integrity, efficiency, and keen awareness of the large issues and directions in the field. The office is responsive to the guidance of the High Energy Physics Advisory Panel (HEPAP) and follows closely the recommendations of its various subpanels, notably the Particle Physics Project Prioritization Panel (P5) and its plan for the future as outlined in the 2008 report [1]. The portfolio of science and the accomplishments of the projects and laboratories overseen and nurtured by OHEP are of the highest quality and international standing.

II. Recommendations:

For convenience, we extract and list all the recommendations in this section. The full context for each of the recommendations will be found in the discussion just above each recommendation as it occurs in the text of this report, and we reference these source points in the list below. In many cases the same recommendations arise in several subsections of the report, with slightly varying context, and are consequently cited more than once. It should be noted that the context is important and each recommendation should be read in conjunction with the comments that accompany it, both in the subsection where it first appears and in those where it is subsequently referenced. (A recommendation appearing multiple times will be marked with an asterisk at the second and subsequent appearances.)

1. Charge HEPAP to convene an expert panel, as called for in the P5 report, to formulate a strategic plan for strengthening and expanding the stewardship role of OHEP in accelerator science and technology. *(p5, p22)*

2. Increase the fraction of the total OHEP budget devoted to projects. *(p5, p30)*

3. Recruit and hire additional OHEP staff. *(p6, p10, p17, p23, p25, p30)*

4. Use comparative review panels on a regular basis. *(p8, p15, p19)*

5. Develop standard procedures to ensure that feedback to proposers is routinely provided in a timely way and with as much information as possible, including reviews, for both declined and accepted proposals. *(p8)*

6. Involve program managers in guiding database development. *(p8, p19)*

7. Implement an adequate data base of potential reviewers to support the efforts of the program monitors. The monitors should be consulted to provide input to the process. *(p10)*

8. Work with the Office of Science to address the disparity of funding between university and national laboratory Early Career Awards, taking into account differences in underlying costs. *(p10, p20)*

9. Rebalance program manager travel, possibly reducing the number of non-renewal year site visits, to ensure the availability of time and funding for travel to reviews, conferences and other program activities. *(p11)*

10. Establish templates for reviewers to follow which are designed for ready interpretation. *(p15, p22)*

11. Develop ways to mitigate the delays in funding due to the requirement that MIEs must appear in the budget request. *(p16)*

12. Ensure that all substantial subfields represented in a theory task proposal are evaluated by qualified reviewers. *(p18)*

13. Ensure that proposal declinations be communicated no later than eight months after the proposal deadline. (See also Recommendation 5.) *(p18)*

14. Open the eligibility requirements of the theory home institution program so all advanced HEP graduate students have equal opportunity to participate. *(p21)*

15. Expand the theory home institution graduate student fellowship program to support more students per year. *(p21)*

16. Encourage grant applications from OJI and ECA awardees at the end of their OJI/ECA funding period and maintain an even-handed treatment of applications, regardless whether their university theory group is traditionally NSF- or DOE-funded. *(p21)*

17. Define a transparent method and approval process to facilitate modest funding changes between funding streams in response to evolving circumstances. *(p25)*

18. Develop and articulate a more formal methodology and timeline to define short term and long term operational metrics for OHEP facilities and a method for adjustment for yearly changes. *(p25)*

19. Incorporate into the facility review process the assessment of recommendation responses from previous reviews. *(p26)*

20. Standardize the facility review process to always include a closeout presentation in a form which is immediately useful for the host laboratory or program. *(p26)*

21. Ensure that the OHEP triennial program reviews of laboratory programs include reviewers who are well aligned with laboratory missions, roles, and methodologies. Inclusion of university reviewers is valuable, but the committee should not be dominated by them. *(p26)*

22. Develop more projects to readiness (CD-0, etc.) in order to be able to respond expeditiously to program opportunities. *(p30)*

III. Large Scale Strategic Issues

Finding:
The world of accelerator based high energy physics has evolved significantly in recent time.

Comment:
While the energy frontier has moved to Europe with the LHC, the need for accelerators for discovery science, security, energy, environment, industry and medicine, as discussed in the national workshop Accelerators for America's Future, has continued to grow. A new strategic plan for strengthening the stewardship role of OHEP for accelerators is needed.

Recommendation:
1. Charge HEPAP to convene an expert panel, as called for in the P5 report, to formulate a strategic plan for strengthening and expanding the stewardship role of OHEP in accelerator science and technology.

Finding:
Projects underlie the future of the program. For the period under review, eight projects were underway, with budgets totaling about 5% of OHEP funding. We note however that this was a historic low, and in the period since, projects under OHEP stewardship grew to about 10% of the department's funding and show continued rise today.

Comment:
The panel believes ~20% commitment to projects is roughly the right level for long-term health of the program. The panel also understands that OHEP management shares this view and that the P5 plan is leading naturally to substantial project investment.

Recommendation:
2. Increase the fraction of the total OHEP budget devoted to projects.

Finding:
In 2008 the P5 HEPAP subpanel released its report "*US Particle Physics: Scientific Opportunities A Strategic Plan for the Next Ten Years*" outlining the view of the particle physics community for the coming decade. OHEP is firmly committed to carrying out the P5 plan.

Comment:
The Panel commends OHEP for its commitment to the plan and the actions it is taking to carry it out.

IV. Issues common to all subpanels

National and international standing of the OHEP program

Finding:
The program emphasizes high quality science, and is meeting goals. The international standing is excellent, indicated by the significant roles that US participants enjoy in collaborations abroad, by the international character of Babar, Tevatron, and neutrino programs which attracted large parts of the European and Asian communities to US facilities, and by the overall first rate research. The stability of international partnerships is much improved.

Comment:
There is room for improvement in prompt communication of major decisions to international partners.

Staffing of OHEP

Finding:
Program managers and all administrative personnel are hardworking, dedicated, and thorough, but there are too few people for the size of the mandated workload. In almost all areas additional staff are needed to relieve the load and facilitate operations; theory and accelerator R&D are programs that are particularly hard hit by the staffing shortage. Adding more staff is a perennial problem in the office. Efforts to add staff have been hindered by generic hiring procedures imposed from outside OHEP which are not well matched to the needs of OHEP or suitably targeted to the type of candidate pool OHEP needs to draw from.

Comment:
Creative approaches may be useful, for example drawing part time consultants from the ranks of recently retired DOE or NSF personnel, as well as continuing and extending the standard practices of using federal employees, lab detailees, and IPAs. As with the previous COV, this Panel believes that directed recruitment activities by OHEP management and HEPAP members can be useful, and certain venues such as laboratory user meetings and general HEP conferences may offer effective platforms to advertise the opportunities available within OHEP. Simultaneous recruitment campaigns are probably necessary as serial hiring is too slow.

***Recommendation*:**
3. Recruit and hire additional OHEP staff.

New portfolio-oriented structure

Finding:
The new office structure introduced during this review period appears to be a real improvement that more tightly couples program managers to natural areas of responsibility. Cross-channel couplings via program manager interactions (for coordination of activities and movement of funds) appear to work in most cases but are informal and *ad hoc*.

Comment:
For the smaller programs the informal nature of the inter-portfolio exchanges is probably beneficial in being lightweight, while for the larger programs involving laboratory operations and project management, more formalization of these relationships could make the procedures more robust over time and in changing circumstances, as well as more transparent to the end users.

Proposals and reviews

Finding:
Reviews are generally thoughtful and detailed, indicating good choice of reviewers, but in some cases better alignment between review and program would be helpful. The increasing use of review templates is an excellent development that is beginning to emerge, that eases comparative evaluations and speeds processing. Faster response and prompt forwarding of reviews to proposers is especially important for declines where proposers need feedback to improve. The renewal rate is very high and changes in funding levels are often not very responsive to changes in reviews.

Comments:
Use of review templates should continue, and expand, to help streamline the processing and ease the interpretation of reviews.

Comparative reviews via specially-convened panels are strongly recommended to give incisive information, in the form of differential judgments, for program manager decisions. Such information will aid the program manager in tough decisions and help to maintain highest program quality over time. The Panel understands that reviews will bring a substantial additional workload – a problem we address in separate recommendations.

Timely response and informative feedback to proposers, both in the form of specific reasons in the case of declinations and in routine provision of author-redacted review text, is an area that needs improvement. OHEP may wish to revisit the standard

procedures for proposal handling, seeking ways to streamline, automate, or reduce the workload involved. It may also be helpful to institute response time as an internal metric.

***Recommendations*:**
4. Use comparative review panels on a regular basis.

5. Develop standard procedures to ensure that feedback to proposers is routinely provided in a timely way and with as much information as possible, including reviews, for both declined and accepted proposals.

OHEP electronic database

Finding:
There is evidence of progress on database development since the previous COVs, but the effort is not complete.

Comment:
The Panel believes an accessible, flexible database can be extremely helpful to program managers in understanding the dimensions and statistical features of their program. Such a database should be a regular, daily, tool for program managers. The database can be best optimized for program managers if they are included in discussions and decisions concerning what elements should be in the database. Inclusion of reviewer database will lead to better use of reviewer resources.

***Recommendation*:**
6. Involve program managers in guiding database development.

V. Subpanel reports

1. Accelerator-Based Physics Research

A. Efficacy and Quality of the Program's Processes

The accelerator-based subpanel met on both days of the review with DOE program managers Saul Gonzalez, John Kogut and Alan Stone. After spending the most of the first morning meeting in discussions with the program managers, most of the afternoon was spent reading through the folders provided. The DOE staff had selected a range of folders for us to consider. They included proposals that had been declined funding, proposals which had been awarded increased funding, and proposals that had been awarded decreased funding. They also included examples of funding decisions that were considered straightforward and as well as decisions that were not straightforward.

1. Handling Proposals

Findings:
In spot checking the funding decisions, we did not find any decisions that were questionable. In some cases there were long delays in notifying unsuccessful proponents, and the reasons for rejection were sometimes not clearly stated.

The number of reviewers was three at minimum, but in most cases more. For the largest umbrella grants as many as 20 reviews were solicited. For grants that included both theory and experiment, reviews of both types were solicited.

The grant monitors expressed concern that the existing databases within DOE did not provide the information necessary to identify qualified reviewers and that there is no opportunity for them to modify the data base information themselves.

Comments:
Some reviewers are used repeatedly, while there are many other qualified physicists who could be used as reviewers but are not. Each grant monitor has a pool of reviewers based on experience, rather than having a broad and reliable database to draw from.

We found the reviews were for the most part thoughtful and detailed. The use of templates for reviewers may be responsible for the high quality and this practice is further encouraged. The documentation for the funding decisions was thorough, and the funding decisions followed the OHEP priorities.

It is important to provide feedback to proposers in a timely way and with as much information as possible for the proponents. This should include anonymous copies of the reviews.

Recommendations:
7. Implement an adequate data base of potential reviewers to support the efforts of the program monitors. The monitors should be consulted and provide input to the process.

2. Junior Investigator/Early Career programs:

Findings:
The OJI program has been replaced by the Early Career Awards. This has allowed more awards than in the past. The size of the award for a laboratory researcher is approximately three times that for a university physicist involved in similar research.

Comments:
The increased funding for young researchers is a positive development, which had been recommended by the previous COV. However concern was expressed about the disparity in the funding of these proposals for university vs. laboratory physicists. Members of the COV were concerned not just about the unbalanced funding, but also about the possible impact of this disparity on the selection process. The funds might be used more effectively by a more balanced level of support.

Recommendations:
8. Work with the Office of Science to address the disparity of funding between university and national laboratory Early Career Awards, taking into account differences in underlying costs.

3. Staff Size

Findings:
The staff size has increased since the previous COV review but still falls short of the level needed to handle the work effectively.

The ARRA funding was handled by OHEP in a timely and effective way despite the large increase in work load. Unfortunately there were very substantial additional delays in the Chicago Field Office in processing the awards.

Comments:
Temporary personnel from the labs and HEP community could be a significant source of assistance and an effort should be made to attract them.

Recommendation:
***3. Recruit and hire additional OHEP staff.**

4. Monitoring of projects and programs

Findings:
Written progress reports are received annually from the PIs of all funded programs three months before the end of the grant period. Considerable progress has been made in enforcing guidelines of brevity and content that help ensure that these reports meet the needs of Program Managers.

Annual site visits are seen by Project Managers and PIs as a useful and important aspect of monitoring program progress and status.

Continuation year summaries prepared by Program Managers succinctly describe the status of each program, program changes, challenges, and other developments that help HEP track progress. This is especially important to facilitate smooth transitions when OHEP staff changes.

Comments:
Additional guidance to PI's would be helpful to ensure that annual progress reports provide Project Managers with sufficiently detailed and specific information on the activities of individual PIs. For laboratory-based research groups, we suggest OHEP consider implementing progress reports between major laboratory reviews, on a time scale commensurate with the regular reporting of university groups.

The workload of Program Managers and travel-budget limitations make it difficult to carry out site visits every year and may preclude other useful activities, such as visiting labs, attending conferences, and attending reviews and other project activities that could help Program Managers achieve a better overall understanding of the program.

Recommendation:
9. Rebalance program manager travel, possibly reducing the number of non-renewal year site visits, to ensure the availability of time and funding for travel to reviews, conferences and other program activities.

B. Effect of the award process on portfolios

1. Breadth and depth of portfolio elements

Findings:
The OHEP effectively supports high quality science in hadron collider physics, neutrino physics, and rare decay searches. Many investigators are supported in large experiments which produce results addressing a large range of questions. Smaller numbers are also supported in narrower single purpose experiments.

New investigators have special opportunities for support through the early career program. The number of early career awards has increased over those with the old OJI program. In addition, separate grants outside of the early career program are sometimes used to fund new initiatives or new people.

Comments:
The peer review process seems to function well in identifying promising areas to support, as evidenced by the many strong results, publications, and Ph.D. theses coming from the program.

The organization of the Office into program lines, appears to be useful in monitoring and improving the balance and quality of the portfolio, although it requires periodic adjustments across these boundaries.

Some of the newer future projects (e.g. on the intensity frontier) have relatively few investigators and will not be attractive to the wider community until the projects are on a firmer footing.

2. National and International Standing of Portfolio Elements

Findings:
The program includes many world-class experiments performed at U.S. facilities. For the period under review, these include large-scale collider experiments such as BaBar, CDF, D0, and CLEO-c, the neutrino experiments MINOS, MiniBooNE and SciBooNE, and the KTeV fixed target experiment. Many of these experiments have substantial participation from abroad.

There are U.S. groups supported by OHEP in most important overseas experiments. These are unique experiments, ranging from BESIII, Super-K, T2K, Belle, MEG, to ATLAS and CMS. They push the intensity or the energy frontier –both parts of the key mission of OHEP.

Comments:
(a) US based accelerator program

During the period under review the US accelerator based program was very successful and made notable advances in the energy and intensity frontier including:

- Tevatron: breaking new ground on SM Higgs exclusion, first observation of B_S oscillations, new top quark mass measurement, first observation of WZ production and single top production;
- B-factories: first observation of flavor mixing in D^0 system, results from B-factories confirming the CKM mixing formalism acknowledged in the 2008 Noble Prize for Physics, BaBar ending an 8 year highly successful run with the discovery of η_b, and discovery of several new exotic particles containing charm quarks;
- MINOS reported their first observation of ν_μ oscillation;
- MiniBooNE showed that LSND results could not be due to simple neutrino oscillations and that a proposed new type of neutrino does not exist.

Many senior investigators have world-class stature. Many young investigators are also playing prominent and important roles. Several are already cross-fertilizing and enriching the LHC physics program.

The scientific impact of the results coming out of the US based accelerator groups has been very high.

(b) Overseas based accelerator program

The multi-year stability and flexibility of U.S. funding in experiments such as ATLAS and CMS has improved the standing of the U.S. as a reliable international partner as well as the impact of U.S. physicists in these experiments. An effort should be made to maintain this situation.

The scientific and technological return and the value for money are very high on the investment that OHEP makes in both the national and international experiments. Experiments such as ATLAS and CMS, at the cutting edge of technology and the frontier of knowledge, are great attractors for the young and produce highly motivated and well trained PhDs in science and technology.

Many senior investigators have world-class stature and are recognized to be so by their international peers. US investigators have been spokesperson for Belle, deputy spokespersons for ATLAS, CMS, BES, and SuperK, and a member of the small T2K executive committee. In addition, numerous OHEP-supported investigators have leadership roles at the next layer in the hierarchy of these experiments such a physics group convenors. U.S. personnel lead in many areas in these experiments. In ATLAS

and CMS the areas range from advanced detector technology, software and distributed computing, to the extraction of scientific results.

It is very valuable to provide adequate support to key individuals selected for experiment-wide leadership roles abroad. It appears that this is being done.

The scientific impact of the US groups is high to very high.

OHEP should remain in a position to exploit future international opportunities that may arise. At the same time it is essential to develop world class facilities in the U.S., as has been done in the past.

2. Non-accelerator-based Physics and Detector R&D

Findings:
The US is a leader in much of this field and we should make every effort to keep it there. A particularly distinctive feature of the field is that it is a fast moving, highly competitive area where new ideas emerge quickly and are vigorously pursued by an aggressive worldwide community.

Comment:
Such a field requires agile, nimble, and responsive management. Some improvements in this area are possible, and will be noted below.

I. Efficacy and Quality of the Program's Processes

Findings:
The panel concluded that this program is very fairly and effectively run. We don't see any effects of under-staffing in our panel on the quality of the process but this is because the program manager is very competent, very effective – and probably overworked.

The panel noted a strong trend towards maintaining the funding levels of grants over time. The data that was provided to the panel for all of OHEP show that 112 of the 307 renewals that could be compared to previous grants changed by less than 5%, though the standard deviation indicates a difference of 60%.

The process of selection, funding and monitoring of the grants is very well documented. Given the relatively small size of many awards, site visits should be regular but need not be frequent.

Comments:

In several of the cases that the panel read, proposal reviewers expressed negative views of the grant, but only outside of their formal responses. Coupled with the trend in the data towards very little changes in the funding levels over time, this suggests that grants are being evaluated based on the historical strength of the group rather than the current strength or productivity of the group. This is of particular concern when considering whether new investigators, new science, or high-risk projects can be competitive. Comparative reviews can be a powerful tool for addressing these issues and keeping the program in peak form.

Providing reviewers with a template is likely to simplify the processing and use of reviews by the program manager.

Recommendation:
***4. Use comparative review panels on a regular basis.**

10. Establish templates for reviewers to follow which are designed for ready interpretation.

II. Effect of the Award Process on Portfolios

Findings :
The breadth and depth of the science resulting from the Non-Accelerator program is excellent.

The panel notes that the threshold of $2M for "projectizing" small projects is quite low. Although this is not the formal "Lehman Process", the projectization requires small projects to adopt a rigorous project management and review structure.

Comments:
The panel is concerned that projectizing small projects will impose costs and administrative burdens that will delay scientific results – a dangerous situation in a fast-moving field that is very competitive. Without projectizing, it is likely that the agility of the program will be increased, though risk will also be increased. Nevertheless, in a dynamic and adventurous field like this one, risk should be acceptable. We worry also that projectization discourages high risk projects because cost contingency may be too high.

We specifically encourage funding some high-risk proposals especially in the non-accelerator program.

The evolution of the portfolio with respect to new investigators and new science is very good, including the management of Early Career Awards. We strongly encourage flexibility of the grant system in order not to impede new investigators and science.

We are concerned that there be sufficient flexibility to react to new ideas when funds need to be moved between projects and possibly between programs; the Panel was informed that a pool of funds for future project R&D exists to address this need. We note that the pressure on the program is considerable and the success rate of new proposals below that typical of the OHEP.

The national and international standing of the portfolio elements

Finding :
The non-accelerator program is first rate and leads internationally in several subfields. Thanks to DOE, observatories in space are equipped with state-of-the-art particle detectors. Unfortunately, because of the limited budget, in past years pioneering efforts like underground neutrino physics have moved abroad when second-generation experiments became relatively expensive.

Comments:
We fear the history noted above may be repeated for ground-based gamma ray astronomy and we urge DOE to try to maintain leadership at the cosmic frontier, specifically in the areas of dark matter, cosmic ray and gamma ray physics both ground-based and space-based. We still strongly support US participation in the best international programs, provided the US plays a significant role.

In this context, timeliness of science is of primary importance and should be a top priority for approving and continuing projects. We again urge simplification of projectization, especially for smaller projects.

Recommendation:
11. Develop ways to mitigate the delays in funding due to the requirement that MIEs must appear in the budget request.

Detector R&D

This is a very attractive program, but circumstances limited the amount of information available during this review. The panel is nevertheless highly supportive and believes that strong support for generic R&D provides a foundation for the future. We note that the success in the program is low. Proposers should be encouraged to work with private companies, which is, for instance, the routine in Europe and Japan.

3. Theoretical Physics

OHEP staff were helpful in preparing for this review and energetic in responding to our requests. In our reading of files, we found that the solicitation and evaluation of proposals and the administration of grants is carried out in an effective and professional manner, following appropriate guidelines.

Program Processes.

Restructuring

Finding:
The recent management restructuring, grouping theory at laboratories and universities together under a single program manager, is a positive development, enabling coordinated support of the full range of theory activities.

Comment:
We did not receive extensive documentation on the laboratory program, but we read the very insightful 2008 review of the laboratory programs. We subscribe to the conclusions of that panel.

Staffing

Finding:
The theory program manager's load is daunting, involving some seventy university grants in addition to the five laboratory programs. The current manager, an IPA whose term will soon end, has done an exemplary job in dealing with a heavy workload. Theory is the only program that currently does not have a permanent program manager, and desperately needs one.

Comment:
Site visits to all theory programs would take at least four years. The current manager is leaving even as a replacement has not yet been hired. The effort to use HEPAP and other outside organizations to inform the community of employment opportunities at OHEP should be continued as one avenue to mitigate the understaffing problem. The theory program needs both a permanent manager and an IPA working together to function optimally.

***Recommendation*:**
***3. Recruit and hire additional OHEP staff.**

Proposal reviews:

Finding:
Sometimes the number of reviews for theory grants is low and/or the expertise of reviewers is not well matched to components of the grant. This is understandable given the large numbers of grants, but it may leave the program officer without adequate information for fully informed decisions.

Comments:
The diversity of interests in many theory grants makes it necessary to consult a proportionate number of reviewers. This is often the case for theory groups in large umbrella grants. This issue was included in the recommendations of the most recent COV.

***Recommendation*:**
12. Ensure that all substantial subfields represented in a theory task proposal are evaluated by qualified reviewers.

Communicating reviews

Finding:
The transmission of declinations has a low priority, and often arrive a full year later after the original proposal, without reviews.

Comment:
Late reporting of declinations leaves investigators without guidance on the shortcomings of their proposals in time for the next grant cycle. This is particularly regrettable for junior scientists. A template for reviews, as recommended in the most recent COV report, may help make the screening and communication process more efficient.

***Recommendations*:**
13. Ensure that declinations be communicated no later than eight months after the proposal deadline. (See also Recommendation 5.)

Record keeping

Finding:
Records associated with current grants were found to be in good order, well organized and understandable. Electronic databases appear to be a work in progress, and the information we received was based on self-reporting, and did not always to correspond to the paper records.

Comment:
Basic statistics on personnel and budget should be transferred to an electronic database, a process that appears to be underway.

Recommendation:
***6. Involve program managers in guiding database development.**

Portfolio

Comparative review

Finding:
While every individual grant is appropriately reviewed by external referees (subject to our comments above), levels of funding often reflect history as much as the balanced positive and negative comments in the reviews.

Comments:
Reviewers usually do not compare grant proposals, and we feel that program managers could benefit from the comparative judgments of experts of diverse experience. The authority and responsibility for final funding decisions would remain with the program manager. We are aware of the extra burden this would impose on the program manager, whose duties include important site visits as well, but consider the substantial benefit to outweigh the marginal cost. The review panels should include members representing the areas supported by the OHEP theory program and should compare and evaluate reviews of the year's regular grant proposals, including renewals. Given the range of theory subfields, comparative review panels for theory should consist of ten to fifteen members.

***Recommendation*:**
***4. Use comparative review panels on a regular basis.**

Early career awards.

Finding:
The expansion of the OJI to the Early Career program is very useful, but there is a very large difference between funding offered to laboratory and university scientists. We were informed that in the case of lab scientists, the funding supports the majority of the salary of the PI, but that as implemented, the lab theory group funding is not correspondingly reduced. The funding previously used for salary is available for other uses.

Comments:
This discrepancy has been remarked on widely in the community, as has the different

eligibility requirements for university and laboratory candidates (university candidates must be untenured, while laboratory candidates can be at any level of the laboratory scientific hierarchy). The availability of these grants to former OJI winners and those with permanent positions at labs undermines the basic goal of identifying and rewarding new talent at the beginning of their careers.

The funding levels for university and laboratory theory Early Career grants should be set at an effectively equivalent level, taking into account differences in underlying costs, and the funds thus made available used to further increase the number of awards.

Recommendation:
***8. Work with the Office of Science to address the disparity of funding between university and national laboratory Early Career Awards, taking into account differences in underlying costs.**

Graduate student funding.

Finding:
In the review period, the theory program manager has implemented two new programs for graduate students: (1) a visiting graduate student fellowship, which allows 5 students to visit the FNAL theory group for a year, open to all advanced graduate students in the country, and (2) graduate student fellowships, with a total funding level of 250K/yr, to fund graduate students working in their home institutions for a year, and renewable for a second year. To reduce paperwork in its first year, the graduate student fellowship program was given as a supplement to existing grants, and so only open to students of DOE-funded PIs.

Comment:
These graduate student fellowships meet a strong need and are responsive to previous review comments that (1) the FNAL theory group could productively advise and mentor many more graduate students than they have traditionally, and (2) DOE grants are often too small to fund graduate students adequately. The importance of graduate student funding for the DOE mission has been recognized by a new DOE-wide program to fund *new* graduate students in a manner similar to the NSF Graduate Fellowship program. In particle theory there is additional need to develop avenues of support for *senior* graduate students, and the OHEP graduate student fellowships have been useful in addressing this need for DOE-funded theory groups. In the short term this strengthens DOE-funded theory groups, but in the longer term additional benefit could be realized by opening eligibility to include senior graduate students independent of the PI's funding source. The NSF's LHC Theory Initiative is an example of a funding program open to advanced graduate students from all institutions. Opening the DOE program similarly will maximize the available talent pool.

This Panel also advocates expanding the program to fund more students. In a scenario of flat or flat-flat budgets the cost of such expansion should be handled through

redistribution of funds within the theory sector, using the results of comparative review panels to identify optimal redistribution patterns.

***Recommendations*:**
14. Open the eligibility requirements of the theory home institution program so all advanced HEP graduate students have equal opportunity to participate in the home institution graduate program.

15. Expand the theory graduate student fellowship program to support more students per year.

Evolution of portfolio strength

Finding:
The theory research portfolio of the OHEP is strong, including world-leading programs, which address strongly the roadmap goals of the Office. It is, however, relatively static overall. Few grants are started, and few wound down over the time scale of this review. Even taking personnel replacement into account, and the natural self-perpetuation of the strongest programs, funding history often carries more weight than is desirable.

Comment:
Some of this problem may be addressed by the use of comparative review panels, as mentioned above. An important practical effect of a history-driven pattern of funding, however, is to limit the program's ability to respond to worthy proposals outside existing group grants. The openness shown by OHEP in awarding OJI and Early Career grants on the basis of panel decisions does partly address this problem. At the termination of these grants, however, the OHEP historically passed over awardees from institutions traditionally funded by the NSF, thus depriving the OHEP theory portfolio of a candidate pool of already demonstrated strength. Although the Panel was informed that current OHEP policy calls for an even-handed treatment of such proposals no examples were shown of OJIs from traditionally NSF institutions moving on to DOE base grants. The Panel strongly supports the even-handed approach and believes a more pro-active stance may help overcome the historical bias:

***Recommendation*:**
16. Encourage grant applications from OJI and ECA awardees at the end of their OJI/ECA funding period and maintain an even-handed treatment of applications, regardless whether their university theory group is traditionally NSF- or DOE-funded.

4. Accelerator Science and Technology

Finding:
The world of accelerator based high energy physics has evolved significantly in recent time.

Comment:
While the energy frontier has moved to Europe with the LHC, the need for accelerators for discovery science, security, energy, environment, industry and medicine, as discussed in the national workshop Accelerators for America's Future, has continued to grow. A new strategic plan for strengthening the stewardship role of OHEP for accelerators is needed

Recommendation:
***1. Charge HEPAP to convene an expert panel, as called for in the P5 report, to formulate a strategic plan for strengthening and expanding the stewardship role of OHEP in accelerator science and technology.**

Finding:
The accelerator science and technology component of OHEP has lost half of its staff through retirement and departures.

Comment:
The workload of the accelerator science and technology staff of OHEP has continued to grow while the strength of the group has attenuated sharply. Formation of and carrying out of a new strategic plan is essential as is capacity for carrying out the day to day work load. OHEP needs to redouble efforts to enhance the staff strength of accelerator science and technology with recruitment of federal employees, IPA's, detailees, and part time retirees to meet the manifest need for new personnel.

Recommendation:
***3. Recruit and hire additional OHEP staff.**

Finding:
Reviewer reports are often difficult to interpret, requiring extra time devoted to their analysis.

Comment:
While most reviews contain the required elements for judgment, many are not transparently clear in their analysis.

Recommendation:
***10. Establish templates for reviewers to follow which are designed for ready interpretation.**

Finding:
The solicitation approach to goal oriented accelerator R&D "campaigns" has proven successful.

Comment:
An advantage is that this approach permits organizations and infrastructures outside of HEP to contribute.

Findings:
Regular site visits are made to monitor progress at the national labs, and results appear in written progress reviews. For the university program, there are too many grants to allow a comparable set of annual site visits, and contact with university groups is had via workshops, conferences, and *ad hoc* site visits.

Comment:
More attention to the university programs even at the level of attending important conferences would be beneficial.

Finding:
The topics covered by university grants are consistent with the stated goals of the HEP program as stated on the OHEP website

Comment:
The university grant proposals were found to be reviewed by at least three reviewers. There appear to be no conflicts of interest in the selection of reviewers. The reviewers were chosen with appropriate expertise to review the diverse topics represented. A broad pool of reviewers is available. The time to receive, review, and select proposals is typically 3 months, whereas the time from submission to funding, which includes the additional processing at the Chicago Field Office, doubles the time to at least 6 months.

Finding:
HEP is successful in attracting a large number of SBIR/STTR grants to bolster their program. Because of the resulting workload, OHEP needs to furnish technical and administrative support for the SBIR/STTR program.

Recommendation:
***3. Recruit and hire additional OHEP staff.**

Finding:
U.S. Advanced Accelerator R&D is world leading and is likely to remain so for some time with the BELLA AND FACET initiatives, high field magnets and superconducting rf and high gradient normal conducting cavities

Finding:
OHEP accelerator R&D program is of great depth and breadth as appropriate for the stewardship role it aspires to play in the Office of Science. The work is appropriately distributed among short, medium and long term activities.

5. Facilities and Operations

I. EFFICACY AND QUALITY OF THE PROGRAM'S PROCESSES

(a) Solicit, review, recommend, and document proposal actions

Findings:
This subpanel is charged with looking at facility operations overseen by OHEP. There are three facilities included in this scope.

Fermilab Accelerator Complex: ($160M in FY09), this involves the operation of the seven accelerator complex, operation of the detectors, computing support for all on-site experiments, and facility specific R&D.

SLAC B-factory: ($18M in FY09) During this period the B-factory operated for two of the three years. In 2008 the B-factory was prematurely shutdown due to funding cuts imposed upon OHEP. Since that time OHEP is overseeing analysis of B-factory data, and disassembly of BABAR and the PEP-II accelerator.

LHC detector operations ($58M FY09) LHC detector operations are managed by US host

laboratories with oversight provided by the DOE and NSF Joint Oversight Group (JOG).

Comments:
The staffing of the OHEP seems thin and many positions need to be filled. These staffing issues affect the progress of the OHEP deliberations and awards. There seems to be some difficulty to pursue hiring more than a few positions during a given time period. A visible consequence of these vacancies is the long delay in issuance of some final review reports.

During the year and at fiscal year boundaries, it is often desirable to move budget between funding categories (B&R codes) within a laboratory's portfolio. The mechanism to carry out these transfers is not clear nor is the required approval level, even when these moves are budget-neutral. There may be corresponding near term and long term budget forecast changes needed which makes this more complicated.

The metrics for OHEP facility operations varies from project to project and program to program depending on the deliverables. The process of defining these goals over several fiscal years is not well understood by the facilities. Furthermore, the metrics are occasionally adjusted for real time events such as actual congressional funding and changing facility capabilities. The method needs additional clarification.

The HEP Program is managed through a large number of B&R codes. The quantity of separate funding codes complicates the operation of the program and may decrease flexibility, responsiveness, and efficiency of the U.S. HEP program. We encourage the OHEP to reduce the number of codes, where possible.

There is a need for interaction between program managers for grants, projects and facilities. This may be taking place now, but there should be a higher level of visibility within the OHEP processes with respect to the optimization of grants, projects and operation of facilities to make most efficient use of resources.

Recommendations:
***3. Recruit and hire additional OHEP staff.**

17. Define a transparent method and approval process to facilitate modest funding changes between funding streams in response to evolving circumstances.

18. Develop and articulate a more formal methodology and timeline to define short term and long term operational metrics for OHEP facilities and a method for adjustment for yearly changes.

(b) Monitor active project and programs

Findings:

The COV sub-panel was provided with reports from facility reviews from Fermilab, SLAC and the LHC.

Several review reports (of those that we were provided) followed the review by many months up to one year, although some were completed as quickly as one month.

Comments:
The reviews undertaken by OHEP continue to be of high quality and utilize qualified experts in the field. In general there appears to be a level of consistency among the individual review reports indicating that a template may have been suggested for the reviewers use. We encourage continued use of templates for these review reports.

The COV's review of a set of Operations and S&T Review documentation generally showed that the review process is engaging experts from the world-wide community and is providing in-depth feedback. What is not evident in the review material is useful follow-up to recommendations from previous reviews. As a best-practice, we suggest that the review charge include an assessment of the responses to recommendations from the previous review.

In some cases, recommendations which would be immediately useful to laboratory or program staff are not well documented at closeout. A well-documented closeout presentation, left with the laboratory or program, would provide immediate "actionable" recommendations prior to the delivery of the full report, which in most cases arrives several months later. The close-out presentation should be kept with the folder as part of the review documentation, even if it is recognized as a preliminary report.

Laboratory Program Reviews often utilize reviewers from the university program. The issues and mission needs of the laboratories in many cases differs greatly from that of universities. As a result, the resulting recommendations (often diverse) from the committee on the program reviews are biased toward making the laboratories operate like universities and not always consistent with those needed from large efficient organizations.

Recommendations:

19. Incorporate into the facility review process the assessment of recommendation responses from previous reviews.

20. Standardize the facility review process to always include a closeout presentation in a form which is immediately useful for the host laboratory or program.

21. Ensure that the OHEP triennial program reviews of laboratory programs include reviewers who are well aligned with laboratory missions, roles, and methodologies. Inclusion of university reviewers is valuable, but the committee should not be dominated by them.

II. EFFECT OF THE AWARD PROCESS ON PORTFOLIOS

(a) the breadth and depth of portfolio elements

Findings:
Metrics have been defined to measure the performance of each of the three areas including LHC detector operations.

The US Tier 1 computing facilities for the LHC are the only international facilities meeting goals.

The "Accelerator Project for the Upgrade of LHC", (APUL) lost funding when the future schedule for upgrades was modified by CERN management in 2010.

FY08 was a very difficult funding year for OHEP. Specific programs were cut in the Omnibus Appropriation. It was not possible to implement the cuts as specified, OHEP formulated an alternate plan to address the shortfall.

Comments:
Overall the COV finds that the OHEP is doing an excellent job of managing the facilities, during a time of challenging budget constraints, to ensure optimal scientific output. Additionally, future facility planning is made more difficult by the delay in LHC physics results which are needed to define the next facility parameters.

The actions taken by OHEP in response to the FY08 Omnibus Appropriates Bill were appropriate and timely. OHEP is encouraged to better communicate the impact of such decisions to the international community.

(b) the national and international standing of the portfolio elements

Findings:
The Tevatron ran throughout the three year period being reviewed. During this time it regularly exceeded its performance metrics.

The B-factory ran through two of the three years. Operation was terminated prematurely in FY08 due to the funding shortfall.

The LHC detector operations performed among the best of the international collaborators based on collaboration metrics.

Comments:
The OHEP facilities have been highly productive during this period, and have held

international leadership positions in multiple frontiers. OHEP is to be commended for the quality of the programs that it has managed during this period.

At the time of this COV meeting the future of HEP accelerator based facilities in the US is at risk. OHEP is concerned and involved in the strategic planning for future facilities. Input is taken from the community through HEPAP, P5, etc. Continued agility in responding to the rapidly changing HEP facility landscape will be helpful in facility planning.

OHEP should make a better case of the international nature of DOE facilities. International participation should be emphasized as a success criterion. Attempts should be made to inform international partners of pending major decisions involving these facilities.

6. Projects

Findings:
Eight projects with a total project cost in excess of about $10M were identified as being active during the period (FY2007-2009) under review by the COV. Seven of the eight projects have Total Project Costs of <$40M and one (Nova) of $278M.

Of these eight projects, one involves substantial partnership with the NSF, two have modest investments from the NSF and one is carried out in partnership with China

Total project funding in FY2007-2009 (inclusive) was about $138M.

Significant additional ARRA funding was devoted to three of these projects, approximately $76M.

On average, about 5% of the total OHEP funding (not including ARRA) was devoted to projects in FY2007-2009

Staff from OHEP monitor and provide oversight for these eight projects. Four members of the OHEP and the Director of the Facilities Division provide the monitoring and oversight functions. Of these five heads, four have additional responsibilities in other areas of the Office. An additional head monitors a potential future project, LBNE for which CD-0 has been obtained.

The monitoring and oversight functions by OHEP are tailored to the needs of specific projects, taking into account the complexity of the project and the evolving status of a particular project. The monitoring function performed by OHEP staff is fulfilled by frequent meetings, monthly and quarterly reports and interactions with project

stakeholders.

OHEP relies significantly on and works closely with the Office of Project Assessment in the Office of Science for independent reviews of projects.

A number of potential future projects of significant funding scope were identified, possibly leading to a potential investment for projects in FY2011 of about 10% of the total OHEP budget. Most of these potential projects would involve interagency and/or international collaboration.

The process for the initial establishment of projects (obtaining CD-0) was described as strongly dependent on the perceived future funding, in addition to meeting mission needs.

Project activities are managed to planned profiles. Baselined projects are protected in budget planning and are managed to the baselined plan. For pre-baselined projects, emphasis is on getting projects ready for a baseline definition. This readiness development is managed through the research and technology portfolio.

Comments:
The efficacy and quality of the processes used to monitor active projects is high. Consistent, periodic and appropriate reporting is used. The OHEP program managers, Federal Project Directors, contractor Project Managers and OHEP and laboratory managers are in substantive contact. One example of a communication disconnect was described and practices are now in place to prevent such a disconnect. Generally, project oversight is practiced to a commendable standard.

The structure and processes within OHEP through which projects are fostered and monitored is appropriate but staffing levels are marginal. It is planned to have about 2 project portfolio FTEs devoted almost solely to projects by mid-FY2011 with continued part-time monitoring of some projects provided by research program managers. If the anticipated future projects are realized in the next few years, particularly large projects (e.g. LBNE), an additional FTE will be needed to provide adequate monitoring and oversight. This is particularly important in light of the growing fraction of projects that are multi-agency or international partnerships and in light of our comments below that the fraction of the portfolio devoted to projects should be increased significantly.

It is recognized by OHEP staff that a close collaboration between research portfolio program managers and personnel providing project oversight is needed. This collaboration is particularly important in the formative stages of a project to ensure adequate early design and R&D support and as a project makes the transition to operations. This collaboration is practiced, and the process by which a project plan is produced is generally successful. However, it could be strengthened by formally defining the needed collaboration between the project and research program managers.

A number of future projects (those starting later than FY2009) were described during

interactions with OHEP staff. CD-0 has been completed for two of these projects (Mu2e and LBNE) but not yet for others, although this may be imminent for dark matter experiments and ProjectX. The committee did not review when CD-0 might be forthcoming for potential projects.

Project funding in the period FY2007-2009 was very low by historical standards, well below the fraction necessary to have a viable future program in HEP. This has been well recognized by the OHEP leadership and the fraction projected for FY2011 is now more appropriately about 10%. A healthy fraction of the total OHEP budget devoted to projects would be about 20%. The future U.S. roadmap covering the three scientific frontiers contains a number of potential projects, some requiring very substantial funding over the remainder of the decade. Taken together, the funding required for all projects anticipated would more than justify an average yearly investment in projects of at least 20% of the total OHEP budget

OHEP appears reluctant to proceed with CD-0 in the absence of likely funding or a very compelling need to advance the design process that becomes possible after CD-0. This is a conservative approach but it may be more fruitful to proceed with CD-0 more readily followed by a later narrowing of options depending on funding levels and the evolving scientific landscape. OHEP has demonstrated the ability to move quickly on projects (those funded by ARRA) that have both a demonstrated mission need and that are ready to receive funding.

The planning perspective in HEP addresses the energy, intensity and cosmic frontiers. Relative to the national and international standing of the program, and to the quality of the program with respect to these frontiers of HEP, OHEP planning has been effectively considering projects that address the intensity and cosmic frontiers. The current LHC program addresses the energy frontier in an international context. However, the receding prospects for an ILC postpone exploitation of the next step in energy. The US OHEP planning is considering opportunities that address the intensity and cosmic thrusts. The fraction of the OHEP program devoted to projects is too low to effectively advance in these areas.

***Recommendations*:**

***3. Recruit and hire additional OHEP staff.**

***2. Increase the fraction of the total OHEP budget devoted to projects.**

22. Develop more projects to readiness (CD-0, etc.) in order to be able to respond expeditiously to program opportunities.

VI. Comments on OHEP Responses to Previous (2007) COV Recommendations

The following summary of 2007 COV recommendations and OHEP responses as of September 2010 was compiled by OHEP staff. In each case we add the comments of this Panel.

Recommendation 1. An urgent effort be directed to filling all the vacant staff positions in the Office, and consider adding additional IPA positions.

OHEP Response: In process. A staffing plan was developed that identified our office immediate staffing priorities. Recruitment efforts are at various stages to meet our needs. We are using both IPA's and detailees to help with the program workload; we currently utilize the expertise of seven IPA's and two detailees.

This Panel: We note that this is still an unsolved problem and the present report repeats essentially the same recommendation. We urge that the process continue, encourage additional help from Panel members, and add new emphasis on use of Laboratory detailees. We also suggest some ideas to use the available workforce more effectively.

Recommendation 2. Documentation and access to program data continue to be improved and data be conveyed in electronic format where this is not yet the case.

OHEP Response: In process. Data from grantees containing demographic information is being collected on physicist faculty, senior research scientists, postdocs, and graduate students.

This Panel: We see progress has been made, but agree that the effort is still in process. We recommend including program managers in the development process so the database will best meet their needs.

Recommendation 3. The Office continue to work with P5 and HEPAP in evolving the medium term program.

OHEP Response: On-going. P5 produced a report on the priorities for an optimal HEP program over the next ten years (2009-2018), under four funding profile scenarios which articulates the scientific opportunities which can and cannot be pursued; the overall level of support needed in the core research & advanced technology R&D programs; and the impacts.

This Panel: OHEP is following the P5 plan as closely as possible within budgets.

Recommendation 4. OHEP decisions and the rationale behind them be effectively communicated to the community.

OHEP Response: On-going. We have taken a more proactive posture regarding communicating with the community decisions made and the rationale behind them. The recent OHEP reorganization was presented to HEPAP and the new structure posted on the HEP website along with the rationale behind the decision.

This Panel: Improvements are noted in this area, particularly in the context of the reorganization. However, there remain problems in the transparency of some decisions. We have noted several with respect to facilities and made specific recommendations for improvement.

Recommendation 5. The Office develop a process to globally optimize and comparatively review the balance of support for HEP research at Fermilab, the universities and the other laboratories in light of the evolving program.

OHEP Response: Complete.

This Panel: The OHEP reorganization addresses much of this issue, but one new matter (laboratory/university balance in Early Career Awards) has appeared.

Recommendation 6. The office understand and communicate appropriate best practices for reviews and ensure they are followed.

OHEP Response: In progress. We are working to streamline processes and make them as meaningful as possible. We are starting to document policies and practices for all reviews.

This Panel: We concur with OHEP that this is a work in progress. We observed that a number of improvements have been made in the review processes, particularly in the latter portion of the three year period under review. We encourage ongoing improvements, and have made specific comments and recommendations, above, to further improve the quality and timeliness of review feedback and reports.

Recommendation 7. The number of Outstanding Junior Investigator awards be increased by devoting more funds to this program.

OHEP Response: Complete. In FY 2007, HEP granted six OJI awards; in FY 2008, HEP granted ten OJI awards.

This Panel: OJI awards are now being replaced by the Early Career Award program, which has the potential for stronger support of young investigators. We have also recommended that at the termination of these awards, award winners be considered for future OHEP funding regardless of the traditional source of their institutional funding (Recommendation 15 of this report).

Recommendation 8. New and renewal proposals be limited to a maximum of 10 pages per senior investigator.

OHEP Response: Complete. Ten-page proposal limits have been put into effect. Proposal limits are included on the OHEP website as part of guidelines for applying for a grant.

This Panel: A welcome improvement for all.

Recommendation 9. Outside visiting consultants continue to be used for 3-year renewals of large grants and eliminate site visits in continuation years unless some unusual circumstance warrants such a visit.

OHEP Response: On-going. We use consultants for renewals of large grants, and we have reduced the number of site visits in continuation years unless some unusual circumstance warrants such a visit; this is now standard practice.

This Panel: A heavy travel load appears to be a continuing burden; the weight of this burden is related to the acknowledged shortage of OHEP staff.

Recommendation 10. OHEP consider providing a template to reviewers to provide guidance and greater uniformity of reviews. The office should ensure there are sufficient reviewers for the theory component of multi-task grants.

OHEP Response: In-process. We have not yet converged on a template for reviewers but we have a uniform guidance letter.

This Panel: This recommendation is closely related to 2007 Recommendation 6. As in that recommendation, this COV panel sees improvements and the beginning of the utilization of templates late in the three year period. We strongly encourage this practice as it simplifies the synthesis of the individual reviewers' reports, and allows greater efficiency for OHEP program managers. We note that OHEP did not respond to the second portion of this recommendation regarding the adequacy of reviewers in specific areas. This should be addressed. Additionally we express a similar concern with regard to facility reviews in our report. This should be addressed across the OHEP reviews of facilities and grants in the future. The issue of sufficient reviewers for theory is addressed in Recommendation 11 of this report.

Recommendation 11. Each proposal jacket contain as the first page a brief summary sheet which shows a history of funding levels by task, current funding, and personnel supported by category.

OHEP Response: Complete.

This Panel: A welcome advance.

Recommendation 12. The Office establish a formal advisory mechanism to best optimize the split between ILC accelerator and ILC detector R&D funds.

OHEP Response: Complete. The OHEP reorganization clearly defines the split between ILC accelerator and ILC detector R&D.

This Panel: The Panel did not review this specfic issue.

Recommendation 13. OHEP work with the community and the laboratories to formulate a plan for stewardship of accelerator science in the US during the coming transition to a period without an energy frontier machine.

OHEP Response: Complete. Sponsored by the Office of High Energy Physics in the DOE Office of Science, the Symposium on Accelerators for America's Future brought together more than 400 scientists in Washington DC on October 26th, 2009. The accelerators for America's Future report was issued June 2010.

This Panel: The Symposium for Accelerator for America's Future was a very useful meeting which resulted in a document that can be given to the public, politicians, etc. However we would characterize the response as 'in progress' rather than 'complete', given that the plan is not yet formulated. See Recommendation 1 of this report.

Recommendation 14. The peer-review process in accelerator research be expanded to cover mid-term accelerator research to provide comparative evaluation of the merit of different research efforts.

OHEP Response: Complete. The new OHEP organization provides for general accelerator development and allows for peer-reviews and comparative evaluations.

This Panel: The COV acknowledges that planning for a program review of General Accelerator Developments activities is underway.

Recommendation 15. The project initiation and management process continue to be closely aligned with the HEPAP/P5 prioritization process for HEP and the strategic goals of the Office of Science.

OHEP Response: On-going. We are closely aligned with HEPAP/P5, and the recommendations of P5 are factored into our long-range planning.

This Panel: We commend OHEP for its manifest alignment with the P5 recommendations.

Recommendation 16. To the greatest extent possible, only those major projects for which the physics goals are well matched to the priorities in the field, and whose overall scope, cost estimate and funding requirements are consistent with each other should be advanced to construction status.

OHEP Response: Complete.

This Panel: : We acknowledge the fact that this has been the case and recommend that the same high standards should be used while increasing the projects portfolio as recommended in this report.

Recommendation 17. The Office continue to pursue opportunities to support projects in collaboration with other agencies, both domestic and international.

OHEP Response: On-going. To the greatest extent possible, we encourage that the projects that are promoted are consistent with priorities of the field and are consistent with our funding profile.

This Panel: We concur with this recommendation and with OHEP response. We note that OHEP is closely following the P5 Roadmap. International collaboration and attraction of the future US-Based HEP projects for international partners should always be kept in mind and promoted.

Recommendation 18. The Office add staff to the Facilities Division to provide sufficient project management oversight for upcoming major projects.

OHEP Response: Complete. An Instrumentation and Major Systems Program Manager was hired June 2009, and a second program manager was hired May 2010.

This Panel: Staffing remains a serious issues in all sectors of OHEP.

VII. Government Performance Measures

The following table, prepared by DOE staff, summarizes progess in various areas towards goals that were set forth in a December 2006 HEPAP document entitled "*Assessment of Progress towards HEP Long-term Goals"* . The COV Panel takes note of these accomplishments and commends OHEP for its role.

HEPAP Long-term Goals Status

- = Status as of Feb 2007 (HEPAP). No check indicates no result yet.
- = Status as of Oct 2010 (GDC compilation for COV)

Goal	"success"	"good performance"	"minimally effective"
Top Quark Properties	Mass to +/- 3 GeV	Mass to +/- 3 GeV	Mass to +/- 4 GeV
Mass	•		
	Couplings to +/- 10%	Couplings to +/- 15%	Couplings to +/- 15%
$\|V_{ts}\|$	•		
$\|V_{td}\|$	•	•	
$\|V_{tb}\|$	•	•	
CP Violation in B system	A_{CP} in BJ/psi K to +/- 4% (relative)	A_{CP} in BJ/psi K to +/- 4%(relative)	A_{CP} in BJ/psi K to +/- 7%(relative)
Asymmetry, golden mode	•		
	A_{CP} in 15 modes to +/- 10% (absolute)	A_{CP} in 10 modes to +/- 10% (absolute)	A_{CP} in 10 modes to +/- 15% (absolute)
Asymmetry, other modes	•	•	
Higgs	*Discover or rule out SM Higgs $114<m_H<800$ GeV*	*Discover or rule out SM Higgs $114<m_H<800$ GeV*	*Discover or rule out SM Higgs $114<m_H<800$ GeV*
Direct 95% exclusion		*[$158< m_H<175$ GeV]*	
Neutrinos	*Confirm atmospheric*	*Confirm atmospheric*	*Confirm atmospheric*

	neutrino oscillations	*neutrino oscillations*	*neutrino oscillations*
Atmospheric ν mixing	•		
	Measure Δm(atm) to 15% FW at 90%CL	*Measure Δm(atm) to 25% FW at 90%CL*	*Measure Δm(atm) to 25% FW at 90%CL*
Atmospheric Δm		•	
	Confirm/refute LSND	*Confirm/refute LSND*	--
Additional ν types?	•		
	Measure $\sin^2 2\theta_{13}$ <>0 OR <0.06 at 90% CL	*Measure $\sin^2 2\theta_{13}$ <>0 OR <0.1 at 90% CL*	*Improve current limits*
Measure $\sin^2 2\theta_{13}$			•
Supersymmetry	*SUSY searches to 2 TeV in many models*	*SUSY searches to 1.5 TeV in many models*	*SUSY searches to 1.5 TeV in some models*
Direct 95% exclusion		--	
Dark Matter	*Discover (5s) or rule out (95%CL) particle dark matter candidates*	*Discover or rule out (90% CL) particles consistent with DM at s=10^{-45} cm^2*	*Discover or rule out (90% CL) particles consistent with DM at s=10^{-44} cm^2*
Direct detection/exclusion		--	

Summary

2 Completed	Top, CPV
1 in progress	Neutrinos
3 awaiting more data	Higgs, SUSY, Dark Matter

VIII. References

1. *US Particle Physics: Scientific Opportunities A Strategic Plan for the Next Ten Years*
Report of the Particle Physics Project Prioritization Panel
http://www.science.doe.gov/hep/files/pdfs/P5_Report%2006022008.pdf

Appendix A: Panel Members

Jim Alexander, Cornell University, Panel Chair

1. Subpanel on Accelerator Based Experiments
Jim Pilcher, University of Chicago (Chair)
Darien Wood, Northeastern University
TejinderVirdee, CERN, Imperial College of London
Marjorie Corcoran, Rice University
Ron Poling, University of Minnesota

2. Subpanel on non-accelerator-based Experiments
Francis Halzen, University of Wisconsin (Chair)
Hank Sobel, University of California, Irvine
Jean Cottam, NASA-Goddard
Kate Scholberg, Duke University

3. Subpanel on Theoretical Physics
George Sterman, State University of New York, Stony Brook (Chair)
Csaba Csaki, Cornell University
Jonathan Feng, University of California, Irvine

4. Subpanel on Advanced Accelerator R&D
Maury Tigner, Cornell University (Chair)
Chan Joshi, University of California, Los Angeles
David McGinnis, Fermilab
Lia Merminga, TRIUMF

5. Subpanel on Facility Operations
Rod Gerig, ANL (Chair)
Guy Wormser, Laboratoire de l'accelérateur linéaire, France
John Seeman, SLAC
Stuart Henderson, Fermilab

6. Subpanel on Projects
Gary Sanders, TMT Project (Chair)
Gil Gilchriese, LBNL
Jim Yeck, University of Wisconsin

Appendix B: Charge to the Panel

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August 30, 2010

Professor James Alexander
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Cornell University
Ithaca, NY 14853

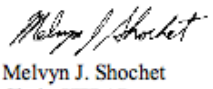
Dear Jim,

Thank you for agreeing to chair the October Committee of Visitors (COV) review of the Department of Energy (DOE) Office of High Energy Physics (OHEP). The review should be conducted in accordance with the enclosed Guidance for DOE Office of Science Committee of Visitors Reviews, issued by the Deputy Director for Science Programs on May 1, 2009.

The COV subpanel is asked to assess the operations of the OHEP during the fiscal years 2007, 2008, and 2009. In particular, as indicated in the Guidance for COV Reviews, the subpanel should assess: (1) the efficacy and quality of the processes used to solicit, review, recommend, monitor, and document application and proposal actions; and (2) the quality of the resulting portfolio, including its breadth and depth of portfolio elements, its national and international standing, and the progress OHEP has made toward its long-term program goals since the last review of these milestones by HEPAP. Are the priorities recommended in the 2008 report of the Particle Physics Project Prioritization Panel (P5) and other recent HEPAP subpanels being reasonably followed? Are the actions of the OHEP maintaining the capabilities needed for healthy laboratory and university programs? Comments and suggestions for improving OHEP processes and their implementation and on the observed strengths or weaknesses in any component or sub-component of the OHEP's portfolio would be appreciated. The subpanel should also comment on what progress has been made in addressing action items from the previous COV.

The results of this review should be documented in a report with findings, comments, and recommendations clearly articulated. The report should be completed for consideration by HEPAP at its fall meeting and submitted to the agency shortly thereafter. I appreciate the COV's willingness to take on this important activity and look forward to its final report.

Sincerely yours,



Melvyn J. Shochet
Chair, HEPAP

Appendix C: Agenda

Wednesday , October 13, 2010			
Time	**Activity**	**Participants/Lead**	**Location**
8:30 am - 9:00 am	Welcome and SC-HEP Overview	Dennis Kovar, HEP Director	A-410
9:00 am - 9:30 am	Budget Process Overview	Glen Crawford, Director Research & Tech. Division	A-410
9:30 am - 9:45 am	HEP Statistics	John Boger, Program Manager	A-410
9:45 am - 10:00 am	Instructions, procedures, and schedule	Jim Alexander, COV Chair	A-410
10:00 am - 10:15 am	Refreshment Break		A-410
10:15 am - 12:15 pm **First Read** Panel Breakout **Session I**	Panel 1 – Accelerator Based Physics Panel 2 – Non-Accelerator Based Physics Panel 3 – Theoretical Physics Panel 4 – Advanced Technology R&D Panel 5 – Facilities Operations Panel 6 - Projects • Panel Overview by HEP Rep(s) (~ 15 min.) • Q & A with HEP Rep(s) • Preliminary Review of Folders	Panel 1 –Jim Pilcher, Lead HEP Reps: Saul Gonzalez, Alan Stone, John Kogut	G-207
		Panel 2 – Francis Halzen, Lead HEP Rep: Kathy Turner, Michael Salamon; Fred Borcherding	G-426
		Panel 3 – George Sterman, Lead HEP Rep: Chung Leung	J-108
		Panel 4 – Maury Tigner, Lead HEP Reps: L. K. Len, Bruce Strauss	E-301
		Panel 5 – Rod Gehrig, Lead HEP Rep: Mike Procario	E-114
		Panel 6 – Gary Sanders, Lead HEP Rep: Ted Lavine; Fred Borcherding	E-401
12:15 pm - 1:15 pm	Working Lunch		A-410
1:15 pm - 3:15 pm **First Read** Panel Breakout **Session II**	Same Breakout Panels and Meeting Locations as Listed in Session I • Review Folders • Formulate Panel Comment		
3:15 pm - 3:30 pm	Refreshment Break (delivered snacks/drinks in each breakout room; coffee only located in H-406		
3:30 pm - 4:00pm	COV Executive Session	COV Panel Leads and Chair	A-410
4:00 pm - 4:45 pm	COV and HEP General Discussion	COV Panel Leads & Chair and HEP Management	A-410
4:45 pm - 5:00 pm	Check-out Germantown Facility	COV members/Christie Ashton	North Lobby
5:00 pm	Shuttle Return to Hotel	COV members/Christie Ashton	Germantown Front Entrance
6:00 pm - 7:30 pm	HEP-hosted Dinner	HEP/COV members	Carrabbas

Thursday, October 14, 2010			
8:30 am - 11:30 am **Second Read** Panel Breakout	Panel 1 – Accelerator Based Physics Panel 2 – Non-Accelerator Based Physics Panel 3 – Theoretical Physics Panel 4 – Advanced Technology R&D Panel 5 – Facilities Operations Panel 6 - Projects • Review of Folders • Formulate Panel Comments • Review 1st Read Comments Refreshments will be served in H-406	Panel 1 –Jim Pilcher, Lead HEP Reps: Saul Gonzalez, Alan Stone, John Kogut	G-207
		Panel 2 – Francis Halzen, Lead HEP Rep: Kathy Turner, Michael Salamon	G-426
		Panel 3 – George Sterman, Lead HEP Rep: Chung Leung	J-108
		Panel 4 – Maury Tigner, Lead HEP Reps: L. K. Len, Bruce Strauss; Fred Borcherding	E-301
		Panel 5 – Rod Gehrig, Lead HEP Rep: Mike Procario	E-114
		Panel 6 – Gary Sanders, Lead HEP Rep: Ted Lavine; Fred Borcherding	E-401
		A-410	
11:30 am - 12:30 pm	Working Lunch		COV Members and Chair
12:30 pm - 4:30 pm	COV Executive Session Preliminary Panel Findings • Merge 1st and 2nd Reads Comments • Formulate Panel Final Comments • Finalize Points/Ratings • Outline Summary for Briefing • Prepare Draft Panel Report Refreshments/snacks will be delivered to A-410	COV members/Dennis Kovar	A-410
4:30 pm – 5:30 pm	Preliminary Closeout Executive Session	COV members/Christie Ashton	North Lobby
5:30 pm - 5:45 pm	Check-out Germantown Facility	COV members/Christie Ashton	Germantown Front Entrance
5:45 pm	Shuttle Return to Hotel	COV Members Only	On their Own
6:30 pm - 7:30 pm	No-Host Working Dinner	COV Members Only	On their Own
Friday, October 15, 2010			
7:50 am	Shuttle Pick-up	HEP Staff	North Lobby
8:00 am - 8:30 am	Check-in Germantown Facility	COV Members only	A-410
8:30 am - 9:15 am	Breakout Panels – Final Wrap-Up	COV and HEP management	A-410
9:15 am - 10:00 am	COV Executive Session	COV Members and HEP staff	A-410
10:00 am - 11:00 am	Closeout Session	COV Members and HEP staff	A-410
11:00 am			