U.S. Department of Energy
and the
National Science Foundation

OCT 13 2017

Dr. Andrew Lankford
Chair, HEPAP
University of California, Irvine
4129H Frederick Reines Hall
Irvine, California 92697

Dear Dr. Lankford:

The Department of Energy (DOE) Office of High Energy Physics (HEP) requests that the High Energy Physics Advisory Panel (HEPAP) charge subpanels to conduct an independent peer review of currently operating experiments supported by HEP [hereafter generically referred to as "HEP experiments"]. This review should focus on the scientific impact and productivity of HEP-supported contributions to these experiments within the context of the overall HEP portfolio. HEP will use the findings and recommendations from this review to help further define a detailed implementation plan for the strategic vision laid out in the Particle Physics Project Prioritization Panel ("P5") Report, as recommended by the recent HEP Committee of Visitors.

This review process is modelled in part on similar "Senior Review" or "Portfolio Review" processes employed by the National Aeronautics and Space Administration and the National Science Foundation to maximize the scientific productivity of their respective mission or facility portfolios within realistic budget constraints, with modifications as needed and appropriate for the DOE mission and experimental portfolio. Therefore, this independent review will serve primarily as advice to HEP. Specifically, HEP will use the outcomes from this process to:

- Prioritize the currently operating HEP portfolio of experiments (including contributions to HEP experiments at off-shore facilities);
- Define an implementation approach to best achieve the goals of the P5 science drivers; and
- Provide programmatic guidance to the HEP experiments concerned for FY 2019 and beyond.

Additional outcomes or programmatic guidance for future years may be provided to the experiments at the discretion of HEP management. Actions resulting from this review process could include changes to research support; extending the planned running of a particular experiment; maintaining the status quo; significantly restructuring the run plan; or terminating HEP support for experimental operations. **All currently-supported HEP experiments that have taken physics data for at least two years, and are expected to request significant DOE support for operations, or related activities (e.g., computing) beyond FY 2018 are subject to this review.**

Printed with soy ink on recycled paper

This letter describes the general objectives and process to be used for this review. Separately, HEP will issue a call for proposals to the lead Principal Investigators, Spokespersons, and/or Institutional Boards for the relevant experiments listed below so that they can address the elements of this charge and the relevant review criteria in a common format. For international collaborations, the appropriate DOE-supported institutional lead(s) should prepare a response, in coordination with international collaboration management, which focuses on the DOE science deliverables as outlined below.

Each experiment that is invited to the HEP Portfolio Review will submit a proposal outlining its primary science goals for the next four years and describing how its research program will benefit the HEP science drivers described in the P5 Report. Performance factors to be assessed will include:

- Science merit and productivity (including training and mentoring of junior researchers),
- Present and anticipated future impact on the P5 science drivers, and
- Efficiency and impact of DOE-supported contributions to the research efforts.

Operations budgets and schedule information will be requested from proposers but will not be an explicit review criteria. DOE will provide additional information about DOE responsibilities and budget scenarios to the review panels.

All operating experiments (as defined above) should be comparatively assessed by a single subpanel, with suitable exceptions for the highest priority items identified in the P5 plan. Therefore, we request two subpanels be formed as follows:

1. The main subpanel: This comparative review panel will assess the scientific merits and impact of DOE-supported contributions to the following operating experiments (in alphabetical order): AMS, Daya Bay, DES, eBOSS, Fermi/GLAST, HAWC, K0TO, MicroBooNE, Minerva, NA61/SHINE, NOvA, SuperK, T2K.

2. The LHC Detectors (ATLAS, CMS) subpanel: This review panel will assess the scientific merits and impact of DOE-supported contributions to the multipurpose LHC detectors ATLAS and CMS. These detectors have been successfully operating since 2008, and other than recent modest upgrades, there have been no major changes to the initial detector configurations. Major detector upgrades for the High Luminosity phase of the LHC program (HL-LHC) are in the advanced planning stages, and U.S. groups have taken important roles in the detector upgrade projects. Given its centrality in the global HEP vision enunciated in the P5 Report, and the high priority placed on this program by HEPAP, DOE intends to support LHC operations and research through the HL-LHC era. U.S. contributions to LHC detector operations are regularly reviewed by the DOE and the NSF in a separate process. Therefore, this subpanel will focus primarily on the efficiency and impact of DOE-supported contributions to ATLAS and CMS research efforts.

A call will be issued in parallel with this charge, along with the specific review criteria for each subpanel to consider, and proposals are expected to be due in November. The subpanels should meet expeditiously so that their final reports can be delivered to HEPAP no later than April 2018. HEPAP will review these reports and communicate its findings and recommendations to DOE.

After HEPAP makes its recommendations, DOE/HEP will contact each of the experiments and communicate guidance resulting from the HEP Portfolio Review. This direction may include new budget guidelines and other specific instructions resulting from the Portfolio Review process, possibly including notices of intent to terminate DOE involvement. DOE/HEP will also post the HEPAP subpanel reports and its response to the HEPAP website. Each of the experiments will submit back to DOE/HEP their plan for complying with the new guidance and instructions. HEP management will ensure that key officials in institutions or agencies that are partners in operating experiments are apprised of DOE's decisions resulting from the HEP Portfolio Review.

We anticipate that this review process will allow DOE the ability to periodically rebalance its HEP experimental portfolio, and adapt as needed to different budget scenarios. We feel the participation of HEPAP is critical in this important process and very much appreciate your timely consideration of these proposals. We look forward to lively and fruitful discussions of this topic at future HEPAP meetings.

Sincerely,

J S Binkley

J. Stephen Binkley
Acting Director
Office of Science

James S Ulvestad

James S. Ulvestad
Assistant Director (Acting)
Mathematical and Physical Sciences
National Science Foundation