



**DOE High Energy Physics (HEP)**

**response to the**

**AAAC Annual Report (March 2016)**

**27 October 2016**  
**Kathy Turner**

**Key:**

**Finding related to DOE-HEP**

**Recommendation related to DOE**

**DOE-HEP comments**

# AAAC Annual Report (March 2016)

## Findings & Recommendations

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### Section 2

***FINDING: Thanks to US investment in basic research at NSF, NASA, and DOE, the US program in Astronomy and Astrophysics has achieved spectacular breakthroughs over the past year.***

### Section 3

***FINDING: US agencies work well together to support the priorities of the scientific community, both in collaboration on large managed projects and in coordination of diverse research programs.***

***FINDING: Some unique information in the high quality data that will be obtained in several future surveys— particularly LSST, Euclid, and WFIRST— will be significantly enhanced by combining their analysis at an early “pixel” stage, rather than a more highly reduced catalog stage.***

***RECOMMENDATION: Where it can improve overall science productivity and efficiency, cooperation in database design and data sharing is encouraged among US agencies, international agencies, and scientific collaborations.***

### **DOE-HEP:**

- TriAgency/TriProject (TAG) Group (Agency plus Project people) meets monthly to discuss DOE/NASA/NSF cooperation on Euclid/LSST/WFIRST, in particular Joint Data Processing & Simulations.
- DES collaboration has had meetings with LSST to help in knowledge transfer (HEP labs have gotten recommendations in reviews to ensure this is happening for their roles & responsibilities)
- DESI collaboration has many people that were on BOSS, so knowledge transfers automatically.

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### **Section 3 cont.**

***FINDING: With its history of successes funded by NASA, NSF, and DOE, CMB science crosses the boundaries of agencies. Third generation ground-based efforts and suborbital payloads are now reaching the sensitivity that could enable ground-breaking discoveries of CMB B-modes.***

***FINDING: The scientific community studying the cosmic microwave background has made significant progress on a unified strategy for a fourth generation, ground-based survey of the Universe (“CMBS4”), orders of magnitude more capable than current experiments, with enormous potential for new scientific discovery. A larger role of DOE coordinated with NSF is important to realize the great scientific potential of CMB-S4.***

***RECOMMENDATION: We encourage DOE, NSF, and the university community to continue working toward a plan for a future (Stage 4) ground-based CMB experiment.***

### **DOE-HEP:**

As recommended by P5 (HEPAP subpanel which reported in May 2014; this is our [Strategic Plan](#)), HEP is planning to participate in a CMB-S4 project as part of our program plan. The community-based CMB-S4 collaboration has developed a Science Book and a notional array of several telescopes in Chile and the South Pole with approximately half a million detectors. HEP is working with NSF (PHY, AST, and Polar offices) to coordinate planning for a path forward. We are charging AAAC to carry out a subpanel study to develop the Science requirements → Technical requirements, and to develop a Strawman concept.



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### **Section 4.8**

***FINDING:*** *The agencies are working together to ensure that the highest priorities of NWNH, WFIRST and LSST, are moving forward. WFIRST has recently successfully moved into the formulation phase under the guidance of NASA, and LSST is well into the construction phase, with the camera under construction under DOE support and facility construction in the MREFC line at NSF led by AST.*

***RECOMMENDATION:*** *The agencies should continue to pursue international partnerships in order to further accomplish the goals of NWNH. The AAAC's "Principles for Access to Large Federally Funded Astrophysics Projects and Facilities" should guide the process.*

### **DOE-HEP:**

- Building further international cooperation and partnerships was an important theme of the P5 Strategic Plan.
- Most of our projects and experiments are international collaborations & many couldn't be done optimally (or sometimes at all) otherwise.
- We have been a member of the Global Science Forum's Astro-Particle International Forum (GSF APIF) since its start; GSF can no longer host and APIF recently accepted a proposal from KIPAC (SLAC/Stanford) to be the host going forward.
- We adhere to the AAAC 2014 "Principles" document, with the understanding that reciprocity is an important factor. The arrangement for contributing to building and operating the experiment and data access (open, after an appropriate proprietary period) is part of the plan from the beginning.



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### Section 5

***FINDING: Spending for astronomy and astrophysics research continues to lag the optimistic scenarios included in NWNH. Lack of a consistent funding stream puts some of the agency programs at risk and does not support the long term planning needed to execute the decadal survey plan.***

***RECOMMENDATION: We urge that the full programmatic funding required by the three agencies to execute their FY 2017 plans, as described in their budget requests, be provided.***

### **DOE-HEP:**

- We understand this recommendation to be directed mainly to Congress.
- For DOE-HEP, the FY17 President's Request provides a slight increase (~ \$1M) for Cosmic Frontier; We are awaiting the approved budget to develop the plan for the year.

### Section 6

***FINDING: Over the last decade proposal success rates in Astronomy and Astrophysics have dropped significantly. This is not principally the result of a decline in proposal merit, changing demographics, or an increase in the average funding request per proposal (beyond inflation). Rather this is a consequence of flat or declining budgets for individual investigator grants, more investigators, and a larger proportion of multiple and resubmitted proposals. In the absence of facility divestment by NSF/AST over the coming years, proposal success rate is expected to decline even further.***



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### Section 6 cont.

***FINDING: A very low proposal success rate impacts both researchers and the agencies. Researchers spend more time resubmitting meritorious but unfunded proposals and serving on review panels. Some researchers may elect to leave the field or decide not to pursue original and potentially transformative research. Agencies must manage the increased workload, staffing problems, and increased costs associated with reviewing more proposals.***

***RECOMMENDATION: Community based groups, such as the AAS and the APS, should study the recent and projected growth of the leading US astronomy and astrophysics research community for the next decadal survey planning exercise of the end of this decade.***

### **DOE-HEP:**

- We understand this recommendation to be directed mainly to AAS & APS.
- For HEP Cosmic Frontier, the grant approval rate was 52%/58% in FY15/16 (PI approval rate 48%/45% in FY15/16); with low statistics, the changes shouldn't be taken as significant.
  - Note that HEP typically provides less funding than requested and also our community expects people to have roles and responsibilities on all phases of an experiment, i.e. not data analysis alone.

