



Department of Astronomy

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Dr. Wes Huntress, Chair
NASA Advisory Council Science Committee

Dear Wes,

The NASA Advisory Council's Astrophysics Subcommittee (APS) met at NASA Headquarters on 16-17 April 2013. In attendance for all or part of the meeting were APS members Joel Bregman, Jamie Bock, Julianne Dalcanton, Edna DeVore, Giovanni Fazio, Scott Gaudi, Gabriela Gonzalez, Chryssa Kouveliotou, Gary Melnick, John Nousek, Terry Oswalt, Paul Ray, Karl Stapelfeldt, and myself as Chair, as well as Paul Hertz (Director, NASA Astrophysics Division) and APS Executive Secretary Joan Centrella (NASA Astrophysics Division). APS member Gary Bernstein attended about 2/3 of the meeting via telecom.

During the course of this meeting, Paul Hertz updated the APS on activities in the Astrophysics Division (ApD) at NASA HQ. Associate Administrator John Grunsfeld briefed us on the current budget situation and outlook. We also received updates on a number of missions, programs, and initiatives. In particular, we wish to thank Paul Hertz for arranging a presentation on mission costing, which the APS had requested following our meeting last summer.

In the following, we address a number of concerns that arose during the course of the meeting that we determined should be brought to the attention of the Science Committee.

Issue: Removal of EPO Functions from SMD:

The APS expressed deep concern about the proposed Administration elimination and consolidation of NASA's Education and Public Outreach (EPO) programs. We are strongly supportive of the administration's goals of efficiency and effectiveness in STEM education; however, we feel that the proposed implementation works against these outcomes. Over the past several decades, NASA has developed a model that engages highly skilled outreach and educational professionals embedded in the scientific teams leading its major missions (*Hubble*, *Chandra*, *JWST*, etc).

Finding: The result of this long-term dedication to education and public outreach is an extremely efficient process where scientists and educators routinely collaborate on developing high-impact content for education and public engagement. In contrast, the proposed realignment shifts all education and outreach efforts far from the actual science being communicated. The end result may appear to improve the process by removal of functional redundancies, but actually separates the content providers at NASA from the agencies tasked with providing EPO programs. This will likely necessitate new layers of personnel to interface between NASA scientists and educational professionals in the Department of Education, NSF, and the Smithsonian. Furthermore, the new implementation effectively counteracts the astrophysics community's long-standing dedication to outreach and education, by clearly making these activities "somebody else's job."

Recommendation: We feel that a concerted, multi-agency effort should be made to identify an alternate implementation that achieves the Administration's goals of capturing knowledge of best practices, guarantees effectiveness, implements program evaluation, and takes advantage of expertise in the Department of Education, without dismantling the highly efficient and effective public outreach activities that NASA has already invested in. Furthermore, we are deeply concerned with the haste with which this change is being implemented: this makes the matter of significant urgency, because the departure of key, experienced outreach professionals has already begun in response to the current uncertainty.

Issue: Mid-Decadal Review

The funding projections for the foreseeable future for the non-*JWST* portion of Astrophysics suggest that flat budgets, in real-year dollars, are likely to prevail. This implies a decrease in purchasing power over the decade at the rate of inflation. The 2010 Decadal Report (*New Worlds, New Horizons*) wisely anticipated that budget uncertainties might complicate planning and included options tailored to what was then considered to be the bounding extremes of possible 2012–2021 budgetary outcomes: an optimistic scenario in which a total of \$3.7B would be available over the decade for Decadal Report recommendations and a more conservative projection of \$3.0B available over the decade. Consequently, the Decadal Report advocated a balanced science program that was carefully designed to fit into specific budget scenarios. Unfortunately, the current best projections for the non-*JWST* funds available to NASA Astrophysics for implementing Decadal Report recommendations amount to less than \$1B over the decade. The magnitude of the difference between even the most conservative assumptions underlying the decadal recommendations and the best estimate of expected resources is striking and well exceeds what could have been reasonably anticipated in 2010. While we are pleased that the new Explorer missions *TESS* and *NICER* will be funded, it will be four years between the 2010 Announcement of Opportunity (AO) that led to the selection of these missions and the issue of the next SMEX AO (the Decadal Report recommended 2.5 years between Explorer AOs).

Findings: There are many manifestations of this problem, affecting essentially all levels of the 2010 Decadal Survey priorities, including all of the top priorities outlined in the report. The most recent and alarming examples include the delay in the new start of *WFIRST*; the suspension, and likely cancellation, of the most recent Mission of Opportunity in the Explorer Program, the two-year delay in the next Explorer AO, the severe budget cuts to the *Fermi* MO&DA budget for FY14 (see below), and the reduction of the Astrophysics technology development grants. It is becoming painfully clear that the Astrophysics program will suffer further severe reductions throughout this decade unless budgetary fortunes change.

Recommendations: The APS believes it is important to thoughtfully manage our way through this crisis, in a manner that preserves the science priorities of the 2010 Decadal Report while also considering the health of the astronomical community. To this end, the APS recommends that at the time of the Mid-Decadal Review:

1. NASA provide the National Research Council (NRC) with their best estimate of the funds available for new starts through 2021;
2. NASA should inform the NRC that the APS believes that the most helpful response to NASA Astrophysics is one in which the many priorities of the 2010 Decadal Report are proactively brought into closer alignment with the expected resources, while maintaining the scientific priorities outlined in that report to the extent possible.

We commend NASA for allowing individual missions and projects flexibility in managing their current budgets. We note in particular that the *Fermi* project management assigned high priority to its Guest Observer program and was successful in preserving more than half of its Guest Observer program when it originally looked like the program would be zeroed out for a year.

Issue: Explorer Mission of Opportunity Cancellation

The APS expresses its deep concern for the cancellation of the 2012 Explorer Mission of Opportunity due to the recent additional budget constraints.

Findings: We consider this a serious loss for the community and the agency, both of whom expended enormous effort and expense preparing and reviewing the proposals received. Such opportunities, including the Mission of Opportunity line, are particularly valuable during times of limited resources; this was one of the reasons the 2010 Decadal Report ranked the vitality of the Explorer Program as its second highest priority. We hope that near future budgets allow the funding of new Explorer missions, which provide exceptional science at modest cost.

Recommendation: The APS recommends that the Astrophysics Division work toward expediting future Explorer Program opportunities.

Issue: Impact of Sequestration:

The APS questions with concern the severity of the NASA implementation of the OMB guidance with respect to Agency-sponsored scientific conferences and public events. We recognize that the circumstances of the Federal Budget sequester did not allow for painless planning and are pleased that furloughs and layoffs have been avoided throughout the Agency.

Findings: Prolonged implementation of these measures may have irretrievably negative effects for the Agency. The cancellation of NASA-sponsored scientific meetings (including the STScI May Symposium, *HST* Calibration Workshop, ExoPAG, and Sagan Summer School) undermines the Astrophysics Division's ability to support mission data analysis, communicate key mission results, and organize future projects. Travel restrictions imposed on Agency and contractor staff are degrading their professional standing and reducing NASA's presence and impact in the community, thus impeding NASA's ability to work with the world-wide research community. The APS strongly endorses the statement by the American Astronomical Society (issued on March 27, 2013) on the Impact of Federal Agency Travel Restrictions during the budget sequester.

(see <http://aas.org/posts/news/2013/03/aas-statement-impact-federal-agency-travel-restrictions-scientific-conferences>)

Recommendation: The APS urges NASA, as soon as possible, relax current travel restrictions and return to its longstanding practice of regular sponsorship of public and scientific events. While the APS endorses scrutiny of spending to make sure Federal dollars are spent efficiently and effectively, blanket cancellations without thoughtfulness is not the way to do this. NASA spends \$98M a year to operate *Hubble*, for example: cancelling a *Hubble* science conference saves only \$50K, but diminishes the science impact of *Hubble*. This is simply not cost effective.

Sincerely yours, on behalf of the Astrophysics Subcommittee,



Bradley M. Peterson, Chair
NAC Astrophysics Subcommittee

Cc: Paul Hertz
Joan Centrella