

## Terms of Reference

### **Balloon Program Independent Review Subcommittee of the Astrophysics Advisory Committee**

The Balloon Program Independent Review Subcommittee is established as a subordinate group (hereinafter, "Subcommittee") of the Astrophysics Advisory Committee (APAC), a stand-alone advisory group established under the Federal Advisory Committee Act (FACA). The Subcommittee has been established at the discretion of the Director, Astrophysics Division, following the recommendation of the Decadal Survey on Astronomy and Astrophysics 2020 in its report, *Pathways to Discovery in Astronomy and Astrophysics for the 2020s*.

The Subcommittee will conduct an Independent Review of the NASA Balloon Program. The purpose of the review is to assist NASA's Astrophysics Division in maximizing the scientific yield and operating efficiency of the Balloon Program within the available funding. For the purpose of this Review, the Balloon Program incorporates both the Balloon Project Office at Wallops Flight Facility, which provides flight capability, and the research programs including the Astrophysics Research and Analysis (APRA) program, which provide payloads and science. For the purpose of this Review, the Balloon Program incorporates the needs of all users of NASA's balloon capability, including all Divisions of the Science Mission Directorate as well as reimbursable users.

NASA will use the findings from this Review to assess the funding and mission model of the Balloon Program. NASA will also use the findings from this Review to:

- Define an implementation approach and mission model to achieve SMD science goals and astrophysics strategic objectives;
- Prioritize the activities of the Balloon Program to maximize flight rates and science return;
- Leverage the capabilities of commercial suborbital platform and system providers; and
- Issue initial funding guidelines for the Balloon Project and payload development programs including the suborbital investigations elements within the APRA program.

The role of the Subcommittee is to respond to the recommendation of the Decadal Survey on Astronomy and Astrophysics 2020 for "an external review of the balloon program to establish a framework for accomplishing the competing needs of achieving flight capabilities and launch rates that meet demands, ensuring adequate investment in payloads, and lowering barriers to entry." The Subcommittee will compile findings based on the response from the Balloon Project Office to the review's questionnaire as well as the PAG 2020 Balloon Roadmap Report. The guiding evaluation criterion is to achieve an efficient mission model with high flight rate and a maximum return for a wide range of science investigation, technology maturation, and training of the next generation of NASA leaders.

The subcommittee will consider:

- The findings of the 2020 Balloon Program Roadmap;
- Measures of success for Balloon Project Office and Astrophysics Research and Analysis (APRA) endeavors;
- The experiences of Principal Investigators, project managers, and institutions in the proposing, implementation, and operation of balloon missions and APRA investigations;
- Balloon projects and APRA principles, including the means by which they are implemented and enforced, as well as the implications of non-conformity;
- Potential trades among cadence, cost (including cost-caps), and risk in implementing future balloon projects and APRA investigations; and
- Lessons-learned for consideration in future implementations of balloon projects and APRA investigations.

The Subcommittee will prepare a report that includes findings and recommendations to assist the Astrophysics Division implement a more effective Balloon Program:

- Prioritized list of balloon technologies/capabilities needed to enable science investigations and technology maturations for future missions;
- Prioritized list of launch site requirements and what constitutes a healthy campaign cadence and expected number of launches per campaign;
- For the Astrophysics Research and Analysis Program, a healthy number of balloon investigations and notional funding profiles;
- Capabilities of commercial suborbital flight providers and efficiency gains to be leveraged; and
- Ways to reduce barriers to entry, particularly for new PIs and new (to the Balloon Program) organizations, including underrepresented people and organizations.

The Director, Astrophysics Division, will appoint the Chair and members of the Subcommittee, for terms of up to 18 months. The Subcommittee will have approximately eight to fifteen members. The membership will consist of individuals with relevant experience and expertise drawn from government, academia, independent researcher centers, and industry. Members of the Subcommittee who are not Regular Government Employees will be designated Special Government Employees. Staff and travel support for the Subcommittee Chair and members will be provided by NASA.

The Director, Astrophysics Division, will appoint a Designated Federal Officer for the panel who will coordinate membership, meeting, and other requirements.

The Subcommittee is expected to be responsive to the requests of the Director, Astrophysics Division, and the Associate Administrator, Science Mission Directorate. The Subcommittee can hold in-person meetings, virtual meetings, and/or hybrid meetings as necessary. The Director, Astrophysics Division, or the Subcommittee may establish panels as needed. It is expected that all or most meetings will be non-public and attendant FACA administrative procedures will be adhered to.


The Subcommittee will report to the APAC and will not provide advice or work products directly to NASA. The Subcommittee Chair or designated member will submit an Independent Review report containing the Subcommittee's recommendations and findings, as well as its work products, for public deliberation by the APAC. After public deliberation of the Independent Balloon Program Review report delivered to it by the Subcommittee, the APAC will deliver a final report to NASA reflecting its formal

recommendations to NASA, as well as append an unedited copy of the Independent Balloon Program Review Subcommittee's report.

These Terms of Reference will be terminated at either the discretion of the Director, Astrophysics Division, following consultation with the Associate Administrator, Science Mission Directorate, or 18 months from its signed effective date, whatever comes first.

The Director, Astrophysics Division, may extend these Terms of Reference and the terms of the members of the Subcommittee at anytime up to 18 months from its signed effective date. Should the Director, Astrophysics Division, extend these Terms of Reference and the terms of the members of the Subcommittee, a new expiration date shall be explicitly stated.

**PAUL HERTZ**

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Paul Hertz  
Director, Astrophysics Division  
NASA Science Mission Directorate

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Date