

National Aeronautics and
Space Administration

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Reply to Attn of: SMD/Heliophysics Division

SUBJECT: NASA Response to the 2023 Senior Review for Heliophysics Operating Missions

Background

The NASA Science Mission Directorate (SMD) conducts reviews of operating missions within each division every three years to maximize the scientific return from these projects within finite resources. NASA uses the findings from each Senior Review to define an implementation strategy for the next five fiscal years and give programmatic direction to the projects reviewed. The specific findings of the 2023 Heliophysics Senior Review are used to:

- Prioritize continued funding of the operating mission projects,
- Define an implementation approach to achieve division strategic objectives,
- Provide programmatic and budgetary direction to projects for 2024 and 2025, and
- Issue initial funding guidelines for 2026, 2027, and 2028.

This established practice was codified in the National Aeronautics and Space Administration Transition Authorization Act of 2017 (PL 115-10; Sec 513 (a) 1)):

"...The Administrator shall carry out triennial reviews within each of the Science divisions to assess the cost and benefits of extending the date of the termination of data collection for those missions that exceed their planned missions' lifetime. "

The 2023 Senior Review for Heliophysics was conducted April 17-21, 2023, and included NASA-led and Principal Investigator-led projects, and foreign-led projects in which the U.S. is a partner (the Senior Review assesses only the U.S. fund portion of foreign-led missions). A single panel reviewed all the missions, and the panel included three IDEA (Inclusion, Diversity, Equity, and Accessibility) focused reviewers as full members.

Projects previously designated as Heliophysics System Observatory (HSO) Infrastructure (ACE, SOHO, Wind) were not included in this review as they are separately reviewed every three years in the Heliophysics Division (HPD)'s HSO Infrastructure Review. While the New Horizons project was invited to the Senior Review, that project decided to not propose an extended mission in HPD.

NASA is very grateful to the Heliophysics Senior Review panel members for their thoughtful reviews of the missions, engagement during the week-long Senior Review panel meeting, and their helpful suggestions to NASA, all of which required significant time and dedication. The panel provided several findings and recommendations for both NASA and the individual projects, all of which can be found at <https://science.nasa.gov/heliophysics/resources/senior-review/2023>.

NASA has responded to some of the major recommendations, and further below are summaries of the decisions for each project.

Overview of Results

The review panel evaluated each of the twelve projects independently with regards to the science investigation results in the last Senior Review cycle, the science investigation proposed for the next Senior Review cycle, and the value to the HSO outside of the projects' own science investigations.

In its review, the panel found that the HSO would benefit from more system-level coherence to improve scientific output and reduce the closed nature of certain communities. Thus, the panel recommended that "NASA develop a strategy and implementation plan for a more coordinated [Heliophysics System Observatory] mission portfolio." NASA concurs with the spirit of this recommendation. As part of its post-Senior Review discussions with the projects, NASA will consider ways to improve coordination within the HSO.

An IDEA plan was required of the projects for the first time in this Senior Review, and the panel found the quality of the plans varied significantly among the proposals. Because this was the first time IDEA plans were required, NASA instructed the panel to not include the assessment in the projects' overall ratings. The panel recommends that the IDEA plans be included in the overall rating for all future Senior Reviews and that NASA continue to provide professional development and resources for IDEA. NASA is currently implementing the IDEA Plan requirement across its programs and acquiring lessons learned. The next Senior Review will incorporate best practices, which may include the addition of IDEA Plans in overall ratings.

The Senior Review found that the Heliophysics Data Resources Library (HDRL) has the potential to more effectively contribute to efforts to ensure project data is truly open access, promptly archived, easily accessible, and compliant with NASA Open Science policies. NASA concurs with the noted potential gains from greater HDRL involvement. NASA has been developing HDRL's capabilities with an intent to integrate it into the management of the HSO mission data sets and plans to continue in that direction.

NASA Decisions

AIM

The AIM project will be terminated. The AIM spacecraft lost power and has a high likelihood of re-entering Earth's atmosphere before power can be restored. KDP-F will be scheduled no later than December 2023.

GOLD

The GOLD project will be transitioned to HSO Infrastructure for another three years of operations. It will be invited to the 2026 HSO Infrastructure Review.

Hinode

The Hinode project will be transitioned to HSO Infrastructure for another three years of operations. It will be invited to the 2026 HSO Infrastructure Review.

IBEX

The IBEX project has been approved for another three years of continued operations with a science investigation. However, NASA will not invite it to the 2026 HPD Senior Review, pending the successful launch and commissioning of the IMAP spacecraft. After IMAP begins science operations, IBEX will be transitioned to HSO Infrastructure and will be invited to the next HSO Infrastructure Review.

ICON

The ICON project will be terminated. NASA lost communication with the ICON spacecraft in November 2022 and has been unsuccessful in its many attempts to re-establish contact. KDP-F will be scheduled no later than January 2024.

IRIS

The IRIS project has been approved for another three years of operations with a science investigation. It will be invited to the 2026 HPD Senior Review.

MMS

The MMS project has been approved for another three years of operations with a science investigation. It will be invited to the 2026 HPD Senior Review.

SDO

The SDO project will be transitioned to HSO Infrastructure for another three years of operations. It will be invited to the 2026 HSO Infrastructure Review.

STEREO

The STEREO project will be transitioned to HSO Infrastructure for another three years of operations. It will be invited to the 2026 HSO Infrastructure Review.

THEMIS

The THEMIS project has been approved for another three years of operations with a science investigation. It will be invited to the 2026 HPD Senior Review.

TIMED

The TIMED project will be transitioned to HSO Infrastructure for another three years of operations. It will be invited to the 2026 HSO Infrastructure Review.

Voyager

The Voyager project will be transitioned to HSO Infrastructure for another three years of operations. It will be invited to the 2026 HSO Infrastructure Review.

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