

Heliophysics Advisory Committee (HPAC) Report

Report to the NASA HQ Heliophysics Division
From the February 12-13, 2024, HPAC Meeting

SUMMARY OF THE 12-13 FEBRUARY, 2024, HPAC MEETING

We convened a hybrid meeting on Mon.-Tues., 12-13 February, 2024.

- All HPAC members were present for all or part of the meeting (see slide 3 for membership list)
- The Designated Federal Officer (DFO) was Janet Kozyra, NASA-Heliophysics Division (HPD)

Presentations to HPAC on February 12:

- Heliophysics Division Update, Dr. Joseph Westlake
- Discussion & Comments on Space Weather Council (SWC) report, Dr. Nicole Duncan
- Distinguishing NASA and NOAA Space Weather Programs, Jamie Favors

Presentations to HPAC on February 13:

- Europa Clipper & JUICE missions cruise phase coordination, Drs. Louise Prockter & Emma Bunce
- Requirements for Different R&A Programs, Dr. Patrick Koehn
- IDEA – Update on inclusion plans and evaluation procedures in HPD ROSES, Dr. Susanna Finn

We thank all of the speakers for their time and effort preparing material for this meeting.

We welcome any requests from NASA Heliophysics Division for clarification or elaboration on our findings and recommendations

HPAC MEMBERS

- Aroh Barjatya (Embry-Riddle Aeronautical University)
- Dave Brain (University of Colorado, Boulder)
- Paul Cassak (West Virginia University), Chair
- Nicole Duncan (Ball Aerospace), remote
- Christoph Englert (U.S. Naval Research Laboratory), Vice Chair
- Matina Gkioulidou (Johns Hopkins University Applied Physics Laboratory)
- Farzad Kamalabadi (University of Illinois, Urbana-Champaign)
- Laura Peticolas (Sonoma State University)
- Chadi Salem (University of California, Berkeley)
- Lisa Upton (Southwest Research Institute)
- Marco Velli (University of California, Los Angeles), remote
- Jia Yue (Catholic University)
- Eric Zirnstein (Princeton University), remote

SUMMARY OF FINDINGS AND RECOMMENDATIONS

- Finding on NASA Heliophysics Division Activities
- Findings and Recommendation on Geospace Dynamics Constellation (GDC)
- Finding on the Heliophysics Division Budget
- Findings and Recommendations on the R&A Program
- Findings and Recommendations on Community Perception about Space Weather and the Portfolio Balance
- Findings and Recommendations on Community Feedback
- Findings and Recommendations on Science Nuggets
- Finding and Recommendations on HSO Infrastructure Missions
- Findings and Recommendations on Changes to the HISFM Program
- Finding and Recommendation on Legacy Datasets
- Findings and Recommendations on the Space Weather Council
- Findings and Recommendations on the Space Weather Tabletop Exercise
- Findings and Recommendations on Europa Clipper and Juice Opportunities
- Finding and Recommendations on Informing HPAC about the HPD R&A Portfolio
- Finding and Recommendations on Informing HPAC about the Broader HPD Portfolio
- Finding and Recommendation on Resources to Support Development of Inclusion Plans
- Findings and Recommendation on Resources for Inclusion Plans
- Finding and Recommendation on IDEA Implementation

FINDING ON NASA HELIOPHYSICS DIVISION ACTIVITIES

Finding

We commend HPD for successes in the brief time since the last HPAC meeting:

- Appointing a new Division Director, Dr. Joseph Westlake
- First light by the Atmospheric Waves Experiment (AWE)
- Being a part of the quad agency memorandum of agreement for space weather R2O2R collaborations

We welcome Dr. Westlake to HPD and thank the HPD team for their stewardship before his appointment.

FINDINGS AND RECOMMENDATION ON GEOSPACE DYNAMICS CONSTELLATION (GDC)

Findings

- The GDC mission was highly recommended in the last Decadal Survey and continues to be important to HPD.
- GDC continues to be on hold due to budgetary constraints laid out in the FY24 Presidential Budget Request.
- We find that the heliophysics community has concern that this mission will be unable to be implemented with the new Decadal Survey release imminent.

Recommendation

- We recommend that HPD continues to communicate with the community about the status and future of GDC.

FINDING ON THE HELIOPHYSICS DIVISION BUDGET

Finding

- We are concerned about the level of funding resources for the Heliophysics Division both now and in the notional out years. Funding issues run the risk of compromising the division's ability to achieve its goals and risk disrupting the balance of the division's portfolio.

FINDINGS AND RECOMMENDATIONS ON THE R&A PROGRAM

Findings

- We commend HPD for continuing to make R&A a priority.
- We recognize that, while fewer people have been applying to the R&A in recent years, there was a large jump in applications in some R&A opportunities in 2023.
- The jump in applications had an impact on the fraction of successful applicants in some R&A opportunities, perhaps in part leading to selection rates as low as 14%.

Recommendations

- We recommend that HPD continues its efforts to understand the main reasons behind the variation in the number of proposal submissions and award rates. This may include the possible effects of previous congressional funding plus-ups, expiration of extended COVID era projects, etc.
- We recommend that HPD present the results of the above investigation to HPAC.

FINDINGS AND RECOMMENDATIONS ON COMMUNITY PERCEPTION ABOUT SPACE WEATHER AND THE PORTFOLIO BALANCE

Findings

- We find some members of the community have a perception that connecting the relevance of a research or mission proposal to space weather will be more competitive than proposals that do not connect to space weather.
- This has led to community concern that the overall HPD portfolio balance will tend towards topics related to the science behind space weather. This community perception is independent of HPD's actual plans or selection criteria.

Recommendations

- We recommend HPD provide clearer messaging to the community about whether or how space weather, or other "broad impact" statements, are applicable to the call and provide instructions to both proposers and evaluators.

FINDINGS AND RECOMMENDATIONS ON COMMUNITY FEEDBACK

Findings

- We commend HPD's efforts to solicit feedback from the heliophysics community on issues related to R&A funding opportunities, etc., using virtual town halls with an anonymized input capability.
- We find that there may be a lack of participation in the virtual town halls, which could hinder HPD from hearing about issues, or common issues that many people deal with but not conveyed at the town hall meetings.

Recommendations

- We recommend that HPD continues using virtual town halls to convey information to and hear issues from the heliophysics community.
- We recommend that HPD consider alternative ways to gather feedback from the community in addition to the town halls.

FINDINGS AND RECOMMENDATIONS ON SCIENCE NUGGETS

Findings

- We commend HPD's efforts at communicating heliophysics science achievements and results to the general public via "Science Nuggets."
- We find that this an important way to engage the public and to promote heliophysics science and its societal impact.

Recommendations

- We recommend that HPD continue to support science communication in this way.
- We also recommend that HPD continue to make the submission process simple, so that it does not become a barrier for the science community to submit entries.

FINDING AND RECOMMENDATIONS ON HSO INFRASTRUCTURE MISSIONS

Finding

- We find that there is confusion in the community, resulting in concern, about the implications of the forthcoming changes to the HSO infrastructure mission model/concept.

Recommendations

- We recommend that HPD respond proactively to the concerns of the community by clearly communicating information on several topics. These include:
 - details on how this model is being implemented and what changes are being considered,
 - whether, by whom, and to what extent scientific analysis is allowed to be proposed and conducted using infrastructure mission funding,
 - the resulting implications and possible pathways for funding of early career researchers, and
 - whether/how there will be a transition period from the current model to the new paradigm for some missions.

Appropriate venues for communication of this information should be considered.

FINDINGS AND RECOMMENDATIONS ON CHANGES TO THE HISFM PROGRAM

Findings

- There are members of the community who are concerned about recently announced changes to the Heliophysics Internal Scientist Funding Model (HISFM) program, specifically including reports that significant decisions about which projects get funded as part of the Step 1 process will be made by a committee of administrators as opposed to a peer-review process.
- Responses from HPD during the HPAC meeting conflicted with these reports.
- If there is a significant downselect at the Step 1 stage that is carried out by a committee of administrators, it could be inconsistent with the IDEA efforts being undertaken by HPD.

Recommendations

- If there is a significant downselect at the Step 1 stage, we recommend reconsidering this approach in favor of one that is consistent with HPD's IDEA efforts.
- We recommend that HPAC be briefed at the next HPAC meeting about the changes to the HISFM program, with particular focus on the issue listed above.

FINDING AND RECOMMENDATION ON LEGACY DATASETS

Finding

- We find that there are funding gaps for research opportunities using Heliophysics legacy datasets from completed NASA missions and historical observations. Currently, there are restrictions on which NASA programs can make use of these data.

Recommendation

- We recommend that HPD investigate broadening the opportunities for supporting new research projects using these legacy datasets, or inform HPAC of the rationale for not broadening the opportunities.

FINDINGS AND RECOMMENDATIONS ON THE SPACE WEATHER COUNCIL (1 of 2)

Findings

- We find the Space Weather Council (SWC) members have effectively addressed the tasks assigned to them by HPAC. They have provided a thorough and informative report from their May 2023 meeting, and HPAC will pass along the SWC's report to HPD.
- We acknowledge the tremendous amount of work required to compile this report and commend the SWC members for their efforts.

FINDINGS AND RECOMMENDATIONS ON THE SPACE WEATHER COUNCIL (2 of 2)

Recommendations

- For the next HPAC meeting, we recommend that HPD/Space Weather Program provide recommendations on topics for the SWC to discuss (in particular M2M program topics).
- HPAC emphasizes the SWC recommendation for an observational gap-filling analysis and recommends this be part of the agency's response plan to the upcoming Heliophysics Decadal Survey.
- HPAC provides SWC with the following tasks following their February 2024 meeting:
 - Task 1 - Advisory Group Coordination: Continue to coordinate with other advisory committees and report on items of interest to HPD.
 - Task 2 - Gap Analyses: Report on the results of the Space Weather TableTop exercise (TTX) to be held at APL in May 2024.
 - Task 3 - M2M: Hold until further guidance is provided by HPD.
 - Task 4 - Agency Coordination: Continue to report on domestic and international partnerships and opportunities to expand coordination.
 - (NEW) Task 5 - R2O2R: Report on ways HPD can make the R2O2R program more accessible to proposers by gathering feedback from PIs.

FINDINGS AND RECOMMENDATIONS ON THE SPACE WEATHER TABLETOP EXERCISE

Findings

- We commend and strongly encourage NASA-NOAA collaborative efforts on space weather as well as keeping the Space Weather Council informed on their activities.
- We find the End-to-End Space Weather TableTop Exercise (TTX) planned for May 2024 is an impactful way for stakeholders to engage across the space weather enterprise and make progress towards the Implementation Plan released in December 2023.

Recommendations

- We recommend HPD continue to support planning for this TTX activity and seek additional opportunities to engage across the Space Weather enterprise in scenario-planning activities.
- We recommend attention be paid to space weather drivers from above as well as from below, if not in this TTX, then certainly in follow-on TTX activities.
- We recommend that HPD/Space Weather Program incorporate the results of the TTX in their prioritization decisions for filling the identified modeling and observational gaps.

FINDINGS AND RECOMMENDATIONS ON EUROPA CLIPPER AND JUICE OPPORTUNITIES

Findings

- Europa Clipper and JUICE are upcoming missions to Jupiter and some of its moons including Europa sponsored by NASA and ESA.
- Clipper and JUICE will be traveling through the solar wind (plasma and interplanetary magnetic fields) together for over 5 years and will be within Jupiter's magnetic field and in the solar wind.
- We find this to be an excellent opportunity to leverage these missions to advance understanding of small- and large-scale physics relevant to HPD goals.

Recommendations

- We recommend HPD continue discussions regarding potential scientific collaborations between these two missions and Heliophysics missions.
- We recommend that HPD work with PSD to encourage the JUICE and Europa Clipper teams in continuing to investigate the feasibility for high-value science cases during the cruise phase.

FINDING AND RECOMMENDATIONS ON INFORMING HPAC ABOUT THE HPD R&A PORTFOLIO (1 of 2)

Finding

- We find that HPAC continues to lack sufficiently detailed information about the HPD R&A portfolio that would enable the committee to provide advice to HPD.

Recommendations

- We recommend that HPD provide detailed information annually to HPAC about the R&A portfolio in 5 areas, listed in priority order:
 1. The overall R&A budget and its trend with time (in real year dollars and beyond, such as some representation of supported FTEs)
 2. The balance of the portfolio across different parts of the R&A program
 3. Whether there are inequities in funding rates for community members from differing demographic categories
 4. High-quality “proposal pressure” (i.e., fraction of non-selected, highly-rated proposals)
 5. Information about planned R&A funding allocation and distribution in future years

FINDINGS (AND RECOMMENDATIONS) ON INFORMING HPAC ABOUT THE HPD R&A PORTFOLIO (2 of 2)

Recommendations (cont.)

- We recommend that the first three areas listed on the previous slide (overall budget, balance, demographics) be treated with the highest priority.
- While the fourth area requested by HPAC (high quality proposal pressure) is a lower priority, it is likely assessed easily.
- We recommend that “demographics” include (but not be limited to) assessment of early career scientist and minoritized group participation in the R&A program as an indication of the future health of the community.
- We recommend that “high quality proposal pressure” include the funding rate for proposals ranked “Excellent”, “Excellent/Very Good”, and “Very Good”.

FINDING AND RECOMMENDATIONS ON INFORMING HPAC ABOUT THE BROADER HPD PORTFOLIO

Finding:

- We find that we could benefit from improved clarity on how HPD determines, prioritizes, and balances the broader HPD portfolio. Understanding the rationale and guiding principles behind these decisions, as well as the motivation and linkage to HPD overarching objectives, are necessary for us to provide useful recommendations and guidance to HPD.

Recommendations

- We recommend that HPD provide clarification to us on:
 - How the overall budget distribution (e.g., the sandchart figure) is determined (e.g., set by the President's budget, negotiated, etc).
 - How the recommendations from the Decadal Survey are digested and implemented in alignment with HPD objectives.

FINDING AND RECOMMENDATION ON RESOURCES TO SUPPORT DEVELOPMENT OF INCLUSION PLANS

Finding

- We find inclusion plans have great potential to improve the intentionality of inclusion objectives within Heliophysics teams.
- We find there is disparity in institutional resources that potential proposers can leverage to support the development of these plans. This could negatively impact potential proposers from institutions with fewer inclusion resources.

Recommendation

- We recommend providing additional training to potential proposers on inclusion best practices and approaches to developing inclusion plans in order to mitigate concerns that institutions and proposers do not have equal access to inclusion resources. HPD's efforts would benefit from this training going beyond the list of best practices available on the website and in town halls.

FINDINGS AND RECOMMENDATION ON RESOURCES FOR INCLUSION PLANS

Findings

- We find that the IDEA update presented to the group was very informative. In particular, we find that the increased information provided to the community, e.g., via science.nasa.gov/researchers/inclusion, relevant training, and workshops, is helpful.
- We find that there is a concern in the community that, if inclusion plans become part of the proposal evaluation process in the future, the resources required for the execution of the necessary (and important) inclusion efforts could come at the cost of the proposed science effort.

Recommendation

- We recommend that HPD explore whether additional resources can be made available, e.g., from the SMD level, that are dedicated to providing additional funding for inclusion plan activities on awarded grants so that the proposed science effort is not reduced by impactful inclusion efforts.

FINDING AND RECOMMENDATION ON IDEA IMPLEMENTATION

Finding

- We find that there may be conflicts in guidance/requirements placed on PIs on federal grants/proposals with respect to IDEA implementation and restraints placed on them for the same from some ideologically opposing state laws/guidelines. A similar situation existed in the past, during the COVID masking/vaccination era, and could exist again for other topics.

Recommendation

- We recommend that HPD consult NASA counsel and provide guidance to grantholders that find themselves in such conflicting situations between federal and state laws/guidance.