Heliophysics Advisory Committee (HPAC) Report

Report to the NASA HQ Heliophysics Division
From the 17-18 June, 2024, HPAC Meeting

SUMMARY OF THE 17-18 JUNE, 2024, HPAC MEETING

We convened a hybrid meeting on Mon.-Tues., 17-18 June, 2024.

- All HPAC members were present in person or remotely (see slide 3 for membership list).
- The Designated Federal Officer (DFO) was Janet Kozyra, NASA-Heliophysics Division (HPD).

Presentations to HPAC on 17 June:

- NAC Science Committee – Recent Meeting Report, Dr. Paul Cassak
- Space Weather Council – Directions, Dr. Kelly Korreck
- R&A Program – Updates & Discussion, Dr. Therese Jorgensen
- DRIVE Science Centers, Dr. Janet Kozyra
- Outreach – Citizen Science, Dr. Elizabeth MacDonald

Presentations to HPAC on 18 June:

- Heliophysics Division Update & Response to Past HPAC Recommendations, Dr. Joseph Westlake
- Heliophysics System Observatory – Updates, Dr. Joe Westlake and Elizabeth Esther

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 (BAE Systems, Inc.)
- 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

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  - Finding and Recommendation on Legacy Data
- Suggested Agenda Items for the Next HPAC Meeting (As Of Now)

*In order to convey simple conclusions from HPAC that do not require a thorough response from HPD, we are adding this section to the current and future reports.

KUDOS, FEEDBACK, NOTES, and REQUESTS (1 of 2)

- The summary of the progress and research into the effectiveness of the DRIVE Centers was excellent. It provided significant detail on the program, current center topical foci and key findings, in addition to information on team science.
- The citizen science efforts of HPD are excellent.
- We laud HPD for its effective and broad April 2024 eclipse outreach successes.
- We are grateful to HPD for providing some of the requested metrics about the R&A program, and we appreciate their continued efforts to obtain the other requested metrics.
- HPAC voted to pass along the February 2024 Space Weather Council (SWC) report to HPD. The report is amended to include additional recommendations for collaborations in Task 1 Recommendation 1, and an affiliation correction.
- HPD provided very detailed guidance on the topics they would like SWC to address in their next meeting. HPAC forwards these instructions to SWC.
- The level of specificity of the guidance to the SWC was extremely helpful to them; we request that HPD aims for requests for advice from HPAC to have a similar level of specificity.

KUDOS, FEEDBACK, NOTES, and REQUESTS (2 of 2)

- We welcome HPD's suggestion to recalibrate communication with HPAC, and share the desire to focus on a few primary findings and recommendations.
- We understand HPD's point about HPAC's findings and recommendations needing to be "advisory" rather than "oversight," and acknowledge the desire for HPAC to address recommendations in a broader context. However, we are concerned that the advisory vs. oversight labeling could stifle discussion and potentially preclude HPAC from providing useful advice.
- We request presentations from HPD to be shorter than the time period allotted for that topic (excluding interruptions by the committee) so that the committee has time to ask questions and initiate discussion, and to ensure clarity on what advice (if any) is being requested of HPAC. Another option would be to explicitly include Q&A time following each presentation.
- In order to minimize confusion and to progress more efficiently, we encourage clarifying questions during the report-out session and for HPD leadership to communicate with HPAC leadership after the meeting if any finding or recommendation is unclear.
- We appreciate the efforts by HPD to provide slides before the HPAC meeting this time, and request the slides one week in advance for future HPAC meetings.

FINDINGS ON RESEARCH AND ANALYSIS (R&A) PROPOSAL PRESSURE (1 of 2)

FINDINGS

- We recognize the importance of HPD's effort to understand the origins of proposal pressure in Heliophysics 2023-2024 grant opportunities and identifying potential routes to mitigate this issue.
- We recognize there is no clear answer yet on how to definitively determine the origins of this proposal pressure increase and on how to mitigate it. We support HPD's commitment to ensure that any mitigation attempts are assessed carefully in order to continue the tradition of a fair and robust proposal process, to continue to prioritize funding high quality research, and to not introduce bias.
- We find that feedback to proposers is essential, especially to early-career proposers, particularly for proposals that are deemed non-compliant or have earned a low ranking by the panel.

HPD outlined a few options for how to mitigate proposal pressure and discussed merits and detriments of each. HPAC concurred that none of the options were without detriments, and we elaborate on our discussion below. We also include a discussion of having proposals with multiple due dates per year.

- No Due Dates or Multiple Due Dates Per Year:
  - Strength: Using multiple due dates may lower proposal pressure per due date.
  - Weakness: Rolling deadlines can present challenges to some potential proposers, as some of the urgency is removed. Having no deadlines could negatively impact the ability to find reviewers without COIs if the same panel members are retained for the whole ROSES cycle.

FINDINGS ON RESEARCH AND ANALYSIS (R&A) PROPOSAL PRESSURE (2 of 2)

- A Step-1 downselect:
  - HPD pointed out that a Step-1 downselect could be biased in favor of more experienced proposers. HPAC acknowledges that this is a valid concern (a weakness), but that the greater importance on Step-1 would motivate more complete responses from all proposers during that step (a strength).
  - Strength: It was pointed out that a Step-1 downselect could save time for proposers that are discouraged to submit to Step-2, because they do not have to write a full proposal.
  - Weakness: A downselect at Step-1 would increase the burden of finding reviewers to evaluate the proposals.
  - Weakness: Past experiments with Step-1 have had mixed results.
- Triage at Step-2:
  - Strength: Spending less panel time on proposals with a lower initial ranking would decrease the time investment of panel members.
  - Weakness: Proposers with lower ranking proposals would receive less feedback.
  - Weakness: Community members may question the validity of the decision process if some proposals are given less consideration than others.

FINDINGS ON METRICS TO MEASURE THE HEALTH OF THE HELIOPHYSICS R&A PROGRAM (1 of 2)

FINDINGS

Proposal selection rate is an imperfect measure of the health of the Heliophysics R&A program, as mentioned by HPD.

Acknowledging that no single metric provides a perfect measure of the health of the R&A program, we support the desire to use additional metrics. Metrics might be considered across four categories (examples are included in parentheses):

- Level of support of the heliophysics community (e.g., selection rate, selection rate by adjectival rating, # of GS13 that could be fully supported by total R&A portfolio, # of FTE supported)
- Breadth of the portfolio (e.g., a sandchart diagram displaying funding by topic, i.e., solar vs. magnetospheric vs. IT)
- Demographics (e.g., % of early career scientists supported relative to total scientists supported, # of institutions, etc.)
- Success of awards (e.g., # of papers and presentations, press releases, perceived quality of work as indicated by citations, journal impact factor, etc.)

We acknowledge HPD's concern that sharing metrics can inadvertently dissuade early-career researchers to apply to particular opportunities. We commend HPD in considering these community effects and working to mitigate any such effects.

FINDINGS ON METRICS TO MEASURE THE HEALTH OF THE HELIOPHYSICS R&A PROGRAM (2 of 2)

FINDINGS (cont)

Justifications for certain metrics previously requested by HPAC were requested, and are provided below:

1. The overall R&A budget and its trend with time in real year dollars and beyond, such as some representation of supported FTEs) - *Indicates the extent to which HPD R&A allocations are supporting the heliophysics community.*
2. The balance of the portfolio across different parts of the R&A program - *Indicates whether the scientific subcommunities within HPD are being adequately supported.*
3. Whether there are inequities in funding rates for community members from differing demographic categories - *Indicates whether the funding to the community is being distributed in an equitable manner, and whether the future of the community (as indicated by early career scientists) is robust.*
4. High-quality “proposal pressure” (i.e., fraction of non-selected, highly-rated proposals) - *Already provided by HPD at this meeting. HPAC is grateful for the information.*
5. Information about planned R&A funding allocation and distribution in future years - *We retract this request.*

FINDING AND RECOMMENDATIONS ON THE PROPOSED HELIOPHYSICS SYSTEM OBSERVATORY (HSO) EXTENDED MISSION FRAMEWORK (1 of 2)

FINDING

We find the proposed Heliophysics System Observatory (HSO) framework is a reasonable approach to enhance the systems-approach to mission science.

RECOMMENDATIONS

- We recommend that when communicating the HSO Extended Mission Framework RFI to the community, details about the “Transition Phase” should be provided for better community understanding and more informed feedback to HPD. Specifically, HPAC recommends that the “3 year” transition phase be replaced by a case-by-case, reasonable period that is primarily driven by synchronizing the extended mission to the Senior Review cycle cadence, ensuring a smooth transition of the mission to “mission management, operations, and data production.”
- We recommend that HPD explicitly define what exactly is meant by, and included in, management, data, and operation.
- We recommend that HPD emphasize how the proposed structure provides opportunities analogous to programs in other divisions, such as Astrophysics MIDEX Guest Observers.

FINDING AND RECOMMENDATIONS ON THE PROPOSED HELIOPHYSICS SYSTEM OBSERVATORY (HSO) EXTENDED MISSION FRAMEWORK (2 of 2)

RECOMMENDATIONS (CONT.)

- We recommend that HPD encourage, cultivate, and support cross-mission collaboration to break down stovepipes during the Transition Phase in order to meet their stated objectives to increase cross-mission science efforts and campaigns during the Extended Mission phase.

FINDING AND RECOMMENDATION ON LEGACY DATA

FINDING

We find that the Heliophysics community does not have an obvious solicitation for the analysis and study of legacy data products. While some solicitations do not specifically preclude them, the solicitation language (e.g., “are encouraged to include… an element of theory, modeling or simulations”) may lead to the perception that proposals that are solely based on the analysis of legacy data are non-compliant or unlikely to be funded.

RECOMMENDATION

We recommend that HPD evaluate the ROSES landscape to find the best avenue for researchers to submit proposals for the analysis of legacy data and/or adjust solicitation language to make it clear to the community that these proposals may also be considered competitive.

SUGGESTED AGENDA ITEMS FOR THE NEXT HPAC MEETING (AS OF NOW)

- Elaine Ho (AA for Diversity and Equal Opportunity) to discuss IDEA matters, specifically options for minoritized community members that are victims of harassment that do not feel like their experiences are being dealt with appropriately. Kelly Korreck (experience from Women in Astronomy) could undoubtedly also contribute to this discussion.

- A session on HDRL (the HPD archive and data initiative)

- Perhaps talks on the DRIVE Center science results (during lunch)