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August 14, 2023

Dr. Mark Clampin
Astrophysics Director
Science Mission Directorate
National Aeronautics and Space Administration (NASA)

Dear Mark,

The NASA Astrophysics Advisory Committee (APAC) had its Summer meeting on June 27-28, 2023 . The entire two-day meeting was conducted in a hybrid mode, with the majority of APAC members being present with Senior Division management at NASA HQ, aided using WebEx^{tm} video conferencing technology accompanied by a digital portal and a chat-window to assist in exchanging APAC, invited speaker, and community comments. The following members of the APAC attended the meeting in person: Regina Caputo, Erika Hamden, Ryan Hickox (deputy chair), Shirley Ho, Kelly Holley-Bockelmann (chair), Alina Kiessling, and Illaria Pascucci, and Grant Tremblay, while the following attended virtually: Daniela Calzetti, Jessica Gaskin, Erika Hamden, and Shardha Jogee. Mark Mozena was absent due to COVID.

Each day, Dr. Hasan began the meeting by welcoming all the APAC members, and explaining the committee's purpose. Dr. Hasan reminded the APAC members who had conflicts of interest with specific topics on the agenda that they were allowed to listen to the presentation but could not participate in the committee's discussion as they are conflicted. Dr. Hasan then read aloud the Federal Advisory Committee Act (FACA) rules. Dr. Holley-Bockelmann then welcomed the members and the public to the meeting.

The committee received updates on the following topics:

The State of the Astrophysics Division – Mark Clampin
Roman Status – Julie McEnery
Great Observatories Maturation Program – Julie Crooke, Shawn Domagal-Goldman
Time-Domain and Multi-messenger Astronomy Portfolio – Valerie Connaughton
Fermi, Swift, and NuSTAR in the Context of TDAMM – Elizabeth Hays, Brad Cenko, Brian Grefenstette
Progress on the Year of Open Science – Roopesh Ojha
COPAG, PhysPAG, ExoPAG Discussion – Shoulah Nikzad, Justin Finke, Illaria Pascucci
The First Science Results from IXPE – Philip Kaaret

All presentations are available at the APAC website. The APAC thanks all of the presenters for their time and efforts to provide detailed and informative presentations.

The APAC has the following specific findings and recommendations in response to the presentations and subsequent discussions.

Findings

The APAC is pleased to see the imminent launches of the international partnership-led missions XRISM and Euclid, noting again that global participation is increasingly important to maintain a robust astronomical mission portfolio in the face of budget pressure.

The APD science highlights continue to showcase the versatility of JWST as a flagship mission in making discoveries from comets to the first galaxies, while the highlight and science talk from IXPE emphasizes the valuable role the Astrophysics Explorers Program plays in maintaining a balanced science portfolio.

The APAC is cognizant that the consequences of shifting to open data, whether positive or negative, may disproportionately affect early career and under-resourced scientists. Although there is a mechanism to request additional proprietary time, few proposers are aware of this – indeed, many proposers have expressed concern that a request for any proprietary time be viewed unfavorably by the TAC and therefore don't ask for it even if needed.

The APAC appreciates the excellent work being done in TDAMM by Fermi, Swift, and NuSTAR. However, there is a concern that the portfolio of missions is aging and that there is no clear plan or strategy to maintain a TDAMM fleet moving forward. It is not sufficient to say that future small missions will be capable of TDAMM science. It is important to be intentional and strategic about how the TDAMM missions will work together.

In particular, the APAC understands that the current budget climate is not conducive to adding a large TDAMM-specific mission to the portfolio; it is for precisely this reason that APD needs to analyze the consequences of this decision on NASA's ability to address the science questions prioritized in the Decadal, to develop a mitigation plan for the aging fleet on TDAMM capabilities, and to prepare a long-term strategy to prioritize TDAMM within the budget profile.

The Fermi team is to be particularly commended for the work they are doing on IDEA. The APAC was impressed by the imposter syndrome workshop and the team's willingness to disseminate the materials for others to replicate.

APD reported that FINESST proposal acceptance rates are much lower than for other ROSES proposals, which is a concern among the APAC, as it is a mechanism for supporting graduate students.

The rapid acceleration of artificial intelligence breakthroughs signals an oncoming societal paradigm shift that APD may want to take advantage of.

Recommendations

The APAC recommends that information on the length of (or lack of) proprietary time requested in JWST proposals (and other mission proposals as appropriate) be kept confidential from the TAC; this includes the default exclusive time. The STScI, HST, and JWST Users Committees should be made aware of this recommendation and if adopted, this change should be widely circulated.

The APAC approves the TDAMM Science Interest Group and the Starshade Science Analysis Group.

The APAC recommends APD to develop a mitigation plan for the aging fleet on TDAMM capabilities and to prepare a long-term strategy to prioritize TDAMM within the budget profile, including cross-agency and international partnerships as well as prioritization within R+A.

The APAC recommends APD study the impact of increasing the FINNEST proposal selection rates to be more in line with other ROSES proposals.

The APAC recommends that APD undertake an investigation of the ethics, current and potential use cases, and best practices of artificial intelligence relevant to APD activities and opportunities.

The APAC agrees with the Swift Senior Review suggestion to employ an IDEA consultant to promote inclusivity, equity, and accessibility in Explorer missions, and recommends that APD accelerate the plan to provide professional IDEA support to the entire APD portfolio.

The APAC applauds APD for emphasizing mentoring for early career researchers in the Habitable Worlds Observatory (HWO) Technology Assessment Group (TAG) solicitation. APD recommends that funding is allocated so that the mentees can fully participate in TAG activities.

The APAC recommends a thorough presentation on the current status of key HWO technologies be given to the Science, Technology, Architecture Review Team (START) and TAG to prepare the teams, and that the APAC receives a similar review at a future meeting.

Requests for Information:

The APAC requests a presentation from the Scientific Organizing Committee on the white paper from the 2022 TDAMM NASA Workshop.

The APAC requests two charts on the national and international TDAMM-related missions mapped to 1) open science questions, and 2) the needs of the community as outlined in the TDAMM white paper.

The APAC requests an update from Space Communications and Navigation concerning the health of the Tracking and Data Relay Satellite system.

The APAC requests a presentation on use cases and ethics of artificial intelligence in the workplace; APAC member Shirley Ho can advise on an appropriate speaker.

The APAC requests an update from an LGBTQ Special Emphasis Project Manager at Headquarters, Goddard Space Flight Center, or Jet Propulsion Lab at the Fall 2023 meeting on APD IDEA efforts specifically for the LGBTQIA+ community. The request stems from public sentiment that this community has received less support.

The APAC would like an update of the Habitable Worlds Observatory (HWO) Science, Technology, Architecture Review Team (START) and Technology Assessment Group (TAG) selection announcement at the Fall 2023 meeting.

The APAC would like a summary of current Strategic Astrophysics Technology (SAT), Astrophysics Research and Analysis (APRA), and Internal Science Funding Model (ISFM) projects, a breakdown of how they map to Decadal priorities and as a function of fraction of R+A budget.

As SMD collects more information on the impact of Inclusion Plans, the APAC would like an update of lessons learned and outcomes of the pilot, as well as any propositions for monitoring inclusion plan compliance in awarded programs.

The APAC requests information on the FINESST selection rates across SMD.

Since NExSS (Nexus for Exoplanet System Science) completed a programmatic assessment review and David Grinspoon has been appointed as the new Senior

Scientist for Astrobiology Strategy, the APAC requests an update on NASA's plans for astrobiology at the Fall meeting.

The APAC would like more detail on the overguide request to evaluate the performance of the Roman Coronagraph Instrument (CGI) with respect to the mission's goal capabilities and viability of its use beyond a technology demonstration.

The APAC requests clarification on the GOMAP timeline, and would like a more detailed and updated timeline that takes into consideration a funding profile.

Sincerely,

Kelly Holley-Bockelmann, on behalf of APAC