Minutes of the Meeting of the Astronomy and Astrophysics Advisory Committee (AAAC) 23 February 2024

Attendees:

Committee Members:

Britt Lundgren	Wenda Cao	Sarah Horst
Ann Zabludoff	Michael McCarthy (chair)	Nikole Lewis
Darcy Barron	Alyson Brooks	Abigail Vieregg
Hee-Jong Seo	Willie Rockward	

Agency Personnel:

Carrie Black (NSF)	Harshal Gupta (NSF)	Rhonda Davis (NSF)
R. Chris Smith (NSF)	Donna O'Malley (NSF)	Mark Clampin (NASA)
Dan Fabrycky (NSF)	Jason Cunningham (NSF)	Rhiannon Roberts (NASA)
Valerie Maizel (NSF)	Christopher Davis (NSF)	Zoe Wai (NASA)
Allison Farrow (NSF)	Ashley Vanderley (NSF)	Kathy Turner (DOE)
Matthew Viau (NSF)	Jonathan Williams (NSF)	Manuel Bautista (DOE)
Jacqueline Keane (NSF)	Joshua Reding (NSF)	Bryan Field (DOE)
Tanner Abraham (NSF)	Terri Green (NSF)	
Vyacheslav Lukin (NSF)	Carrie Kolar (NSF – Assoc.)	

Others:

Brittany McClinton	Phil Puxley	James Strait
Hannah Marie Peters-Edwards	Lee Curtis	Eric Murphy
Nigel Sharp	Anupam Pandey	Orlando Toledo
Andrew Baker	Suzanne Sincavage	Vancho Kocevski
Md. Nasimul Islam Nihal	James Lochner	Sequoia Fischer
Jainraj M	Sarah Marie Bruno	Richard Rogers
Bethany Johns	Iouli Gordon	Mitch Ambrose
Denis Feerick		

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AAAC Meeting

23 JANUARY 2024

1:02PM Welcome and Opening Remarks

Dan Fabrycky (NSF), the Designated Federal Official, welcomes attendees and opens the meeting. He reviews the AAAC charter duties, the purpose, history, and duties of FACA committees, and reviews the FACA procedures for the AAAC. He reviews conflicts of interest, gift rules, confidentiality rules and procedures, and the Hatch Act and Anti-Lobbying Act. He notes that this particular meeting is important because it is the last meeting before the AAAC report is due in March. Fabrycky then starts a round of introductions.

Mike McCarthy (AAAC Chair) takes the floor to discuss the election of the next Chair and Vice Chair of the AAAC and review the timeline for next year. McCarthy reviews the accelerated meeting schedule from this year and the potential timeline for next year, with discussion and recommendations from the committee. Chris Smith (NSF) wants feedback from the other agencies on the proposed timeline, and Kathy Turner (DOE) and Mark Clampin (NASA) say that the schedule for the upcoming year looks good, but that it must be confirmed at the upcoming agency meeting.

McCarthy introduces Britt Lundgren as the incoming Chair, and the committee discusses the role of the Deputy Chair and leadership within the AAAC. After discussion, Alyson Brooks and Darcy Barron are nominated and confirmed as co-Vice Chairs for the AAAC for the upcoming year. Finalized leadership for the AAAC next year consists of: Britt Lundgren (Chair), Alyson Brooks (co-Vice Chair), and Darcy Barron (co-Vice Chair).

1:35PM – Presentation on Laboratory Astrophysics Task Force, *Mike McCarthy, AAAC Chair*

Mike McCarthy gives a presentation on the purpose, activities, and findings of the Lab Astrophysics Task Force. Topics discussed include:

- NSF and NASA requested that a Lab Astrophysics Task Force (LATF) be formed in August 2022
- The LATF consists of approx. 20 people, in three subgroups:
    - ISM (Interstellar Medium)
    - Planets and Exoplanets
    - Stellar, Nuclear, and Plasma Nucleosynthesis (SNP)

- Activities of the LATF:
    - The LATF was active from March 2023-Jan. 2024
    - It held regular monthly meetings and hosted town halls and community forums, invited subject matters experts to discuss specific needs, and conducted two surveys: for LATF practitioners and one for consumers of lab astrophysics data
    - Created an LATF report with comprehensive findings and recommendations from detailed reports from each subgroup
- The structure and findings of the LATF report:
    - The LATF report is a 65-page document with a 10-page executive summary, appendices, and the three subgroup reports. The final edits are now underway (stylistic rather than substantive)
    - The report identifies five areas critical to lab astrophysics:
        - Programmatic Support
        - Workforce Development
        - Status of Crucial Databases
        - Facilities and Resources
        - Interdisciplinary Effort, Communication, and Collaboration
    - High level report findings:
        - Funding constraints and limitations are an issue – particularly that lab astrophysics is not formally incorporated into mission/facility lifestyle planning.
        - Workforce development is essential, and there is a significant need for training for new laboratory astrophysicists
        - Grants are underutilized
        - Sustained investment is needed to maintain databases
        - Increased attention and investment within astronomy are essential for the growth of the astronomy field itself
    - Overall findings: lab astrophysics is a highly interdisciplinary field. It has a complex network of interconnected supporting parts, but all those parts are needed.
- Reviewed a sampling of areas for improvement/action:
    - Expand access to funding opportunities
    - Promote workforce initiatives from undergraduate to early-career levels
    - Pursue long-term support for curation and development of databases
    - Possibility of creating and supporting cost-effective instrumentation and facility centers (McCarthy notes that this must be carefully considered)

    - Explore opportunities to streamline interagency coordination and enhance communication and collaboration within the astronomical community

The presentation concludes and Mike McCarthy thanks the Lab Astrophysics Task Force for their hard work and dedication.

Q&A Session

The Q&A session after McCarthy's presentation included the following topics:

- Synergies with commercial centers, and how to bridge fundamental and commercial research.
- How lab astrophysics can leverage what industry is doing and vice versa, with the note that databases are crucial for this topic. Sarah Horst notes that the difficulty is in the information-sharing ethos of industry, which is much different from NSF/NASA/DOE.

Mike McCarthy and Dan Fabrycky discuss the next steps of endorsing the LATF report so it can be used in the AAAC report. McCarthy proposes a motion to endorse. Britt Lundgren seconds it, the committee votes with no objections, and the motion passes. Chris Smith (NSF) and Mark Clampin (NASA) thank the LATF and AAAC members who served on the Task Force on behalf of the agencies.

2:04PM – AAAC Report Findings, *Mike McCarthy, AAAC Chair*

Mike McCarthy presents high-level findings of the AAAC report, while noting that everything is still fluid at this stage, as the report is still being written and has not yet been submitted. Topics discussed include:

- Agency overview findings:
    - There has been clear progress in supporting the foundational activities central to the health of the field.
    - The AAAC applauds the agencies' efforts to continue supporting facilities while maturing the scientific readiness of large new facilities and missions from the Decadal, particularly under considerable budgetary uncertainty.
- Five high-priority topics that require interagency coordination, cooperation, or engagement:
    - US Extremely Large Telescope (ELT) Program
        - Committee findings:

                - Reviews the importance of the ELT for maintaining U.S. competitiveness in astronomy, the progress that has been made in the program, and its societal benefits
                - Astro2020 calls for two U.S. ELTs, but the financial picture makes this complicated. Facilities/operating costs are also managed at the Division level, which is not sustainable given the increasing cost of world-class facilities
            - Recommendations:
                - In consultation with OMB, continue to explore agency-level ownership of the facility portfolio within MPS
                - Proceed with all deliberate speed towards a funding decision, while remaining true to the recommendations of Astro2020
                - Address construction and O&M funding for the ELT program
        - CMB-S4 (Cosmic Microwave Background Stage Four)
            - Recommendations:
                - Propose CMB-S4 for the Major Facilities Design Stage and schedule a Conceptual Design Review by the end of FY2024
                - Ensure continued, direct coordination between NSF-OPP, NSF-AST, DOE, and the CMB-S4 project for infrastructure planning
        - NgVLA (Next-Generation Very Large Array)
            - Emphasizes that this is a high-priority recommendation of Astro2020, reviews recent developments
            - Recommendations:
                - In consultation with OMB, continue to explore agency-level ownership of the facility portfolio within MPS
                - Continue to pursue international and domestic partnerships to ensure financial viability
        - Space-based missions: The Great Observatory Maturation Program
            - Reviews current state of GOMAP
            - Recommendations:
                - Advance HWO concept despite budget uncertainty
                - Strong and continued support for Hubble and CHANDRA
- Topics that require Interagency Coordination, Cooperation, or Engagement:
    - Building and Sustaining a Technologically Innovative Workforce
        - Recommendations:
            - Emphasize the essential role of the individual investigator program

                - Continue to prioritize and promote new workforce initiatives
                - Emphasize a Community Astronomy approach in planning and engagement
                - Encourage agency involvement as stakeholders and potential contributors to importance national initiatives and strategy reports on AI, QIS, and Microelectronics Research
                    - Make sure people know that the agencies are developing these useful/cutting-edge technologies
    - Time Domain and Multi-Messenger Astronomy (TDAMM)
        - Recommendations:
            - Joint NSF-NASA strategy for TDAMM observation planning, data publicization, software development, and archive infrastructure.
            - Expanded support for multi-wavelength, multi-messenger science through programs like ACROSS and AEON
            - NASA should consider integrating TDAMM science across missions, ensuring a coordinated approach rather than treating missions in isolation
            - Follow SAG recommendations for selecting vendors for future communication services to ensure TDAMM science needs are met
    - Protecting Dark and Quiet Skies
        - Recommendations:
            - NASA and NOIRLab might collaborate more closely in monitoring satellite constellations to better assess and mitigate impacts on astronomical observations
            - Possibility of establishing new funding opportunities to support comprehensive monitoring of satellites
            - Leverage NASA's expertise in satellite management and collision avoidance to evaluate low-Earth orbit's capacity
    - Establishing Consistent Demographic Standards
        - Findings:
            - Agencies have not made satisfactory progress towards Astro2020's recommendations for standardized demographic data collection
        - Recommendations:

                - Consistent demographic collection and reporting are critical to enabling data-informed approaches to improve DEI
                - Look to NIH and STScI for proven demographic data practices
                - If necessary, seek help from OMB for interagency coordination on demographic data efforts
        - Sustainability
            - Findings:
                - NSF-AST in particular has supported observatories in developing clean energy sources and reducing their carbon footprint
            - Recommendations:
                - NSF should continue funding energy efficiency projects and share successful strategies for greenhouse gas emission and mitigation with other observatories and research centers within NSF and DOE
        - Astronomical Data Infrastructure
            - Findings:
                - Discusses the vast volumes of astronomical data, citing the "Future of Astrophysical Data Infrastructure Workshop"
            - Recommendations:
                - Endorse the Workshop's call for a Steering Committee and broader community involvement in data infrastructure planning
                - Explore cross-disciplinary initiatives to enhance data management practices, leveraging diverse stakeholder involvement

Mike McCarthy concludes the presentation and asks for comments/questions

Q&A/Comment Session

The Q&A session after McCarthy's presentation included the following topics:

- Mark Clampin proposes a clarification on the NASA slide, noting that the Habitable Worlds Observatory is the name of the program, not GOMAP, and that probes are not part of GOMAP.
- Kathy Turner gives feedback:
    - Notes that DOE is coming out with progress they've made in demographics.

    - Going forward, DOE has many projects in QIS, AI, etc. She offers to get the committee information on that for next year.
    - Notes that DOE has huge offices developing sustainable energy sources that aren't in the Office of High-Energy Physics.
    - Notes that Argon is doing energy sustainability studies that could be used for CMB-S4.
- Mark Clampin notes that NASA isn't recognized for the technology development work that they do.
- Discussion of demographic data collection and its purpose/what it will be used for. Mark Clampin says that NASA's Chief Scientists puts out a demographic report, and that he (Clampin) will email it to the committee.
- Mike McCarthy asks if the overview of the report findings prior to report submission was useful for the agencies, rather than just presenting the report as a fait accompli. All three agencies say yes.

2:51PM – 15-Minute Break

3:05PM – Meeting Reconvenes

- The committee discusses the schedule for the rest of the afternoon.
- Mike McCarthy notes that the agency feedback has been helpful, and opens the floor to the rest of the committee for questions/comments
- Discussion of the committee staying consistent with and within the boundaries of the Decadal.
- Discussion of National Science Board reactions to the Decadal and awareness of its recommendations.

3:15PM – Public Comment/Discussion Period

Two questions are asked during the Public Comment Period:

- Question if the committee can add citations to the report that show the uptick in Astronomy highlights in NSF, noting that it would be helpful for advocacy.
- Question if the projects most likely to be spoiled by satellite constellations could be tasked with monitoring them. Discussion of the in-kind donations of astronomers who do this monitoring without pay.

Public comment period ends.

3:22PM – Committee Report Writing and Discussion Session

The committee discusses the report draft deadlines and potentially sharing the draft with the agencies as a good-faith gesture. Mike McCarthy says that the committee needs time to digest and process the information from the meeting, and that further discussions will happen over email. He thanks the Lab Astrophysics Task Force, committee members, and agency members for their time and efforts.

3:30PM – Meeting is adjourned