Astrophysics Probe Explorers (APEX) 2023 Phase A Concept Study Kickoff Meeting and PI Masters Forum

Welcome and Congratulations!

Patricia Knezek – Probe Program Scientist
Doris Daou – Deputy Program Scientist
Mark Sistilli – Probe Program Executive

NASA Headquarters Astrophysics Division (APD)

APEX 23 Phase A Science Evaluation

Questions, Conduct during the Kick-off

- Questions are welcome and encouraged
  - Ask questions on the material in a presentation at the end of that presentation
  - Please hold questions on topics not addressed in a presentation until the end of the kick-off
- Questions will be captured by NASA and posted in the Q&A, as appropriate
  - If you have follow-up questions after the kick-off, please email them to Pat Knezek
- This meeting may not be recorded. NASA will not be recording.
- Mics are to be muted unless you are actively speaking
- Camera usage is encouraged, as appropriate
  - Cameras are not expected to be always on
  - Cameras are encouraged when you are asking a question
- Please be courteous and understanding
  - Virtual meetings may have technical glitches or people talking over one another

		Phase A Kick-Off, Thursday, 14NOV24
Start	**Presentation**	**Presenter, Presenter Title**
1:00 PM	**PHASE A KICK-OFF BEGINS**	
1:00 PM	**Welcome**	Eric Smith, Astrophysics DivisionChief Scientist, (NASA/HQ)
1:10 PM	**Evaluation Overview**	Patricia Knezek, Astrophysics Explorers Program Scientist, (NASA/HQ)
1:35 PM	**Concept Study Criteria & Requirements**	Victor Lucas/Elisabeth Morse, SOMA Acquisition Manager, (NASA/LaRC)
1:55 PM	**Launch Services**	John Calvert, Mission Manager, NASA LSP (NASA/KSC)
2:10 PM	**SCaN**	Jeff Hayes, SCaN (NASA/HQ)
2:25 PM	**Explorers Program Overview**	Shridhar Manthripragada, Assoc Director of Flight Projects for Explorers (NASA/GSFC)
2:40 PM	**Safety & Mission Assurance**	Joe Calabrese, (NASA /GSFC)
2:55 PM	**Break**	
3:25 PM	**International Participation**	Peyton Blackstock, Office of International and Interagency Relations, (NASA/HQ)
3:35 PM	**Export Control**	Juan Santos, Office of International and Interagency Relations (NASA/HQ)
3:45 PM	**SOMA Lessons Learned**	Victor Lucas, SOMA Acquisition Manager, (NASA/LaRC)
4:15 PM	**Writing Level 1 Requirements**	Jared Leisner, Heliophysics Program Scientist, (NASA/HQ)
4:55 PM	**General Questions on Step 2 Process**	Patricia Knezek, Astrophysics Explorers Program Scientist, (NASA/HQ)
5:35 PM	**Adjourn**	

		PI Masters Forum, Friday, 15NOV24
Start	**Presentation**	**Presenter, Presenter Title**
9:00 AM	**PI MASTERS FORUM BEGINS**	
9:00 AM	**Opening Remarks**	Geoff Yoder, NASA Retired Senior Executive
9:15 AM	**Participant Introductions**	Geoff Yoder, NASA Retired Senior Executive
9:30 AM	**JWST Programmatic Considerations / Optics**	Eric Smith, JWST Program Scientist / Lee Feinberg (NASA/GSFC)
10:00 AM	**PI Lessons Learned IXPE**	Brian Ramsey, IXPE Deputy PI, (NASA/MSFC)
10:25 AM	Break	
10:45 AM	**PM Lessons Learned DAVINCI/ OSIRIS REx**	Arlin Bartels, DAVINCI Project Manager, (NASA/GSFC)
11:10 AM	**PI Lessons Learned OSIRIS REx**	Anjani Polit, OSIRIS-APEX Deputy PI
11:35 AM	**DAA Insights: Observations from Past Experiences / Q&A**	Mr. Geoff Yoder, NASA Retired Senior Executive
12:05 PM	**Closing Remarks**	Pat Knezek, APEX Program Scientist, Astrophysics Division, NASA Science Mission Directorate (NASA/HQ)
12:30 PM	**Adjourn**	Mr. Geoff Yoder, NASA Retired Senior Executive

Evaluation Organization

Evaluation Panel

Patricia Knezek, Program Scientist
Mark Sistilli, Program Executive
Science Mission Directorate (SMD), NASA Headquarters

Science Evaluation Panel

Patricia Knezek, Program Scientist
Deputy: Doris Daou
Astrophysics Division, SMD

TMC Evaluation Panel

Victor Lucas, Acquisition Manager (AM)
Deputies: Elisabeth Morse, Sheila Nash-Stevenson
NASA Science Office for Mission Assessments (SOMA)

APEX23 Selected Missions:

Advanced X-ray Imaging Satellite

- This mission would be an X-ray imaging observatory with a large, flat field-of-view and high spatial resolution. It would study the seeds of supermassive black holes; investigate the process of stellar feedback, which influences how galaxies evolve; and help determine the power sources of a variety of explosive phenomena in the cosmos. The observatory would build on the successes of previous X-ray observatories, capturing new capabilities for X-ray imaging and imaging spectroscopy.
- Principal investigator: Christopher Reynolds, University of Maryland, College Park
- Project management: NASA's Goddard Space Flight Center in Greenbelt, Maryland

Probe far-Infrared Mission for Astrophysics

- This observatory would be a 5.9-foot (1.8-meter) telescope studying far-infrared wavelengths, helping bridge the gap between existing infrared observatories, such as NASA's James Webb Space Telescope, and radio telescopes. By studying radiant energy that only emerges in the far-infrared, the mission would address questions about the origins and growth of planets, supermassive black holes, stars, and cosmic dust.
- Principal investigator: Jason Glenn, NASA Goddard
- Project management: NASA's Jet Propulsion Laboratory in Southern California

Phase A Overview

- Selected APEX teams will conduct 12-month Phase A Concept Studies, funded up to $5M (real year dollars).
- Concept Study Reports (CSRs) will be due November 14, 2025.
- NASA will conduct detailed reviews of the Concept Study Reports to evaluate the implementation details of the selected investigations, including any modifications of the scientific objectives, and the implementation including all technical and management factors.
- As a result of this Phase A evaluation, NASA expects to confirm one APEX investigation for Phase B.

Management and Constraints

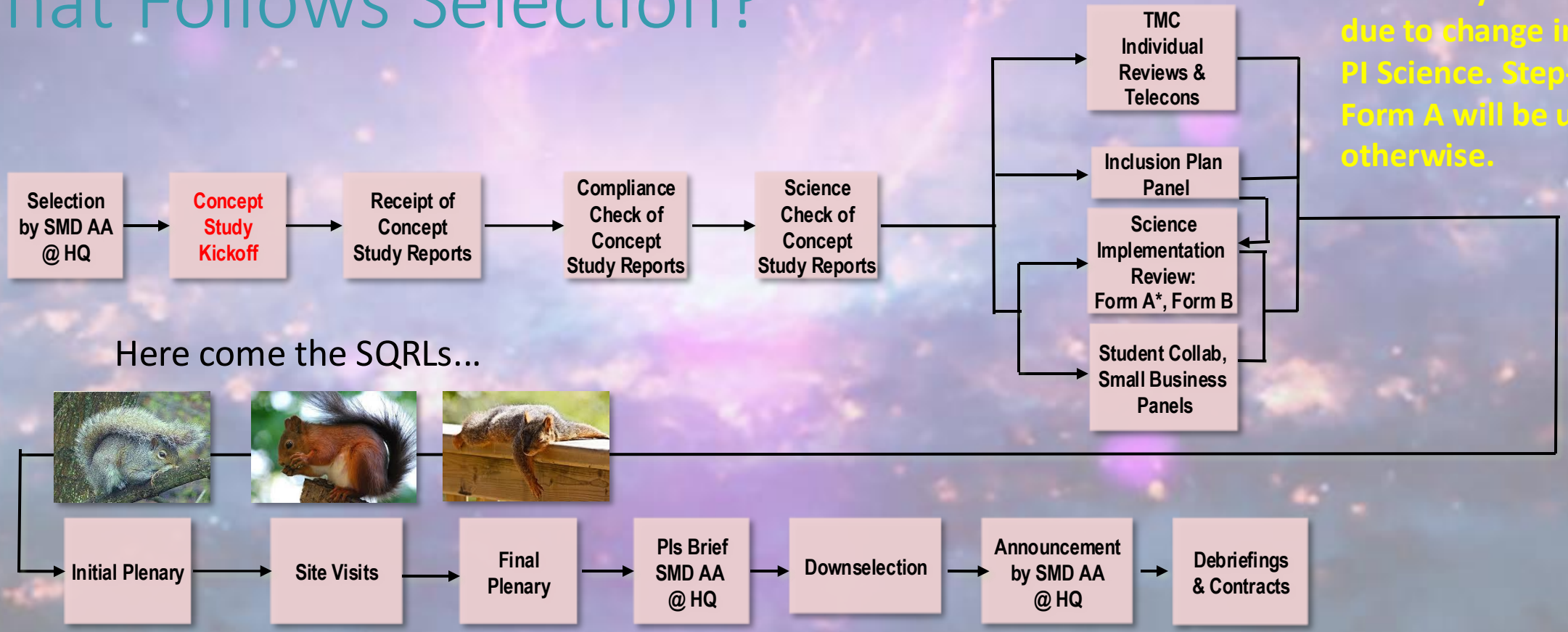
- This kickoff meeting will discuss instructions for the Phase A Concept Study.
- Phase A Study deliverables:
  - Concept Study Report must provide sufficient implementation detail and planning to allow NASA to judge probability of mission success; and
  - Complete cost or pricing data for Phase B shall be included with the CSR for each organization (Appendix L.4 specifies that this may be delayed till the site visit)
- Each mission's Concept Study Report must conclude with a commitment by the PI for the cost, schedule, and scientific performance of the investigation.
- NASA cannot guarantee that the proposed funding profile can be accommodated within the Explorer Program's budget. A funding profile for the selected mission will be negotiated during Phase B. Funding ramp-up for Explorers from the last 4 rounds (2014, 2016, 2019, 2021) has been slower than the PI requested.

Schedule

- The 12-month Phase A clock starts today, 14 November 2024
- We have combined the PI Forum with the Phase A kickoff this year. SOMA hosts presentation slides from PI Forums 7 – 14 at https://soma.larc.nasa.gov/pi-masters-forums/
- Concept Study Reports (CSRs) will be due at 4pm Eastern on 14 November 2025
- Your team can change during Phase A. Draft participant lists are due 3 months ahead, by 4pm Eastern on Thursday 14 August 2025: please let us know ASAP of subsequent changes.
- Document submission will use NASA Box, per CS-11.
- Patricia Knezek (APD, HQ) will be the overall chair of the evaluation team and will lead the science evaluation.
- Victor Lucas (SOMA) will lead the TMC evaluation and coordinate site visits.

What Follows Selection?

*Evaluation of Form A will only occur due to change in PI Science. Step-1 Form A will be used otherwise.



SQRL = Significant weaknesses, Questions and Requests for information List

These are sent ahead of the site visit, after the site visit, and (maybe) from the final plenary

Site Visits

- We plan to conduct one or two-day site visits in-person in March or early April of 2026. A rough timeline, based on the 2021 Astro MIDEX/MO:
  - ~April 2025: NASA asks teams where they intend to host the site visit
  - ~June/July 2025: possible dates offered to teams, considering expected reviewer travel, Federal and major religious holidays. Dates set.
  - January 2026: request to Study Teams for logistics info; SQRL timing and format.
  - February 2026: more information on site visit, SQRLs, secure information transfer, etc
  - ~March/April 2026: site visits

Criteria & Requirements Guidelines

- Astrophysics Probe Explorer 2023 Draft Criteria and Requirements for the Phase A Concept Study may be found at the Explorer Program Acquisition Website
  - https://explorers.larc.nasa.gov/2023APPROBE/
  - Changes for the final version are expected to be small.
- The Q&A page on the website https://explorers.larc.nasa.gov/2023APPROBE/ will track answers to questions, and note changes to documents in the Program Libraries

Evaluation Criteria

- All three criteria from the AO will be used:
  - Scientific Merit (~20%)
  - Science Implementation Merit & Feasibility (including Inclusion Plan) (~40%)
  - Technical, Management, & Cost Feasibility (~40%)
- The Step-2 evaluators will not have access to the Step-1 proposals, nor to the Step-1 reviews.
- Weighting between criteria will be different from Step 1, some individual factors are tweaked, some factors are added
- The TMC review (Criterion C) will be equally weighted with Science Implementation. (Weighting is *internal* to NASA HQ, the review panels are told the weighting, but they do not use it themselves.)
- Quality of plans for Small Business Subcontracting, and for an optional Student Collaboration, and/or Citizen Science, if proposed, are considered separately

Scientific Merit Evaluation: Criterion A

- Step 1 selections were primarily based on science balanced by feasibility. Unless the **PI-proposed** science has changed, the Step-1 Form A will be the Step-2 Form A. *If the PI-proposed science has significant changes, the entire Form A will be re-reviewed.*
- Unless directed, or Concept Study results demand it, objectives of Baseline and Threshold Science Missions should not change.
- Science section from Step 1 proposal (proposal plus clarifications) should be in the CSR. Clarified text should be highlighted and noted as such in the Science Change Matrix.
- Any and all changes (beyond clarifications to Step-1 potential major weaknesses) from Step-1 must be highlighted (e.g. change bars).
- If there are no significant changes (= likely to change the Form A rating) to the PI-proposed science objectives or other aspects of the PI-proposed Baseline and Threshold Science Missions, the Form A rating remains unchanged from Step-1.

Please see the Template Science Change Matrix in the Program Library!!!!

Science Change Matrix Example

Change number	Section(s) / Page(s)	Change in Science Objective or Requirement from Step 1 to Step 2?	Description	Rationale
1	D.2.3, D.3, STM	Yes (Obj. 2B, 2C)	Solar wind structure impact timing accuracy (requirement) updated from 15 min to 10 min.	Phase A mission design and science studies showed the need for a stronger requirement than was planned in the Step-1 proposal.
2	D.2.3	No	On page D-11: orbit altitude changed from 500 m to 500 km.	Typo correction.
3	D.2.3, D.3, STM	No	Descoped mission performance changed from 400 to 455 target observations, which changes the margin over threshold investigation requirements from 33% to 52%.	This change was implemented as part of the Step-1 Clarification Response Document (response to Science PMW-05).

Scientific Implementation Evaluation: Criterion B

- All of the factors defined in Section 7.2.3 of the APEX23 AO apply to the Concept Study and will be re-evaluated from the data supplied in the CSR, at the site visit, and through the final plenary (unlike Step-1, you can give us new information more than once):
  - Factor additions:
    - Added instrument design to Factor B-2
    - Added career development opportunities to Factor B-5
    - Factor B-6 on the Merit of the Inclusion Plan has been updated (evaluated by IDEA experts, see next slide)
    - New Factor B-8: Maturity of proposed Level 1 science requirements and Level 2 project requirements (see next slide+1)
    - New Factor B-9 on Science Enhancement Options: SEO does not contribute to Form B rating. The panel will provide comments to NASA on their findings for this factor. From AO 5.1.6, SEOs will only need to be described in Concept Study Reports if they are atypical (e.g., a complementary ground campaign, complementary observations by other NASA observatories, GO/GI instrument modes or data processing beyond those that are used or validated for the PI-led science program)… The process for deciding on SEO activities may involve further reviews.

Inclusion Plan: Factor B-6*

This factor includes:

- the extent to which the Inclusion Plan provided appropriate processes and goals for both creating and sustaining a positive and inclusive working environment for the investigation team;
- the extent to which the Inclusion Plan demonstrates awareness of systemic barriers to creating inclusive working environments that are or may be specific to the Concept Study team;
- whether the Inclusion Plan contains appropriate activities for equipping team members to build and maintain inclusive working environments;
- whether roles and responsibilities for those participating in the proposed activities are well described and justified; whether the proposed timeline is reasonable for the proposed Inclusion Plan activities;
- whether the Inclusion Plan provides reasonable and appropriate assessment mechanisms for measuring progress in and success of the proposed activities;
- and whether reasonable resources are requested to carry out the proposed activities and if funds are requested, with appropriate justification.
- This factor includes evaluation of the activities that occurred in Phase-A.

This Factor is evaluated by a separate panel and that becomes B-6.

Maturity of Level 1 & 2 Requirements: Criterion B-8

This factor includes :

- assessment of whether the Level 1 requirements are sufficient and mature enough to guide the achievement of the objectives of the Baseline Science Investigation and the Threshold Science Investigation, and whether the Level 2 requirements are a sufficient decomposition of the Level 1 requirements.
  - The Levels 1 and 2 requirements will be evaluated for whether they are stated in unambiguous, objective, quantifiable, and verifiable terms that do not conflict and for whether they are traceable to the science objectives.
  - They will be evaluated for their adequacy, sufficiency, and completeness, including their utility for evaluating the capability of the instruments and other systems to achieve the mission objectives.
  - The stability of the Level 1 science requirements and Level 2 project requirements will be assessed including whether the requirements are ready, upon initiation of Phase B, to be placed under configuration control with little or no expected modifications for the lifecycle of the mission

Evaluation: Other Criteria

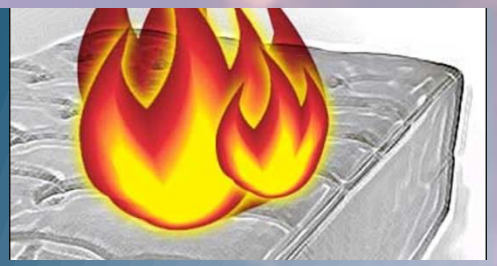
- Feasibility Evaluation: Criterion C – will be covered in the TMC presentation following this one. Victor Lucas (SOMA) will present later this afternoon on common causes of major weaknesses.
- Plans for Small Business subcontracting, and any proposed Student Collaboration or Citizen Science – will be assessed separately

- Step-2 CSR evaluation is different from Step-1 proposal evaluation
  - At Step-1, evaluators give the proposing team the "benefit of the doubt" given the one opportunity to clarify potential major weaknesses; this is no longer true at Step-2.
  - At Step-2, proposing teams may give free-form answers to significant weaknesses, questions and requests for information from the review panels on more than one occasion. Information from answers to reviewer questions and from the site visits will be considered along with the content of the Concept Study Reports.

Communicating with NASA Program Offices

- Communications between Study Teams and the various NASA program offices will be focused to ensure fairness.
  - Communications after this meeting will be controlled.
  - Requests for technical and expert advice should be posed directly to identified Points of Contact (POC's). **We will share APEX23 questions via the Q&A; Your POCs are on your side: if you don't know how to write something up to show how it makes sense or fits the rules, ask!**
  - All programmatic questions, including questions of policy, questions of interpretation, and questions of clarification, should come to HQ/Patricia Knezek.
  - Generic versions of questions and answers will be posted as "Questions and Answers" available from the Probe Explorer Program Acquisition website, https://explorers.larc.nasa.gov/2023APPROBE/.

PI Masters Forum ("burn your bed"?)



- We have recruited speakers tomorrow to talk to you about challenges they faced and how they overcame them in a variety of missions in development
- In addition, the SOMA main page at https://soma.larc.nasa.gov links to all the presentations from PI Masters Forum 7 – 14.

- **<u>This is a new regime for NASA Astrophysics competed missions!</u>**


Questions?