
National Aeronautics and
Space Administration
NASA
EXPLORE
SCIENCE
Dual Anonymous Peer Review (DAPR)
Information for Proposers
Douglas Hudgins
SMD Director of Dual-Anonymous Peer Review

Overview

- Unconscious bias and the motivation for a dual-anonymous peer review (DAPR)
- General Overview of the DAPR process
- Examples of the Impact of the DAPR Approach
- Status of the DAPR implementation across SMD
- How do I make my proposal DAPR-compliant?
- How will my proposal be reviewed?


Unconscious Bias and the Motivation for Implementing the Dual-Anonymous Peer Review (DAPR)

Unconscious Bias and the Peer Review Process

- Unconscious biases are psychological “filters” that the human brain has developed to help us rapidly identify key information in the torrent of data our senses are constantly feeding to our brains.
- Unconscious biases are neither automatically good nor bad—everyone possesses unconscious biases of one sort or another. As a whole, they shape each person’s unique “worldview”.
- However, unconscious biases have a detrimental effect on the peer review process by making it less rational and more subjective. We would like the evaluation of proposals to be an objective process, independent of the worldview of each reviewer.
- Recommended viewing:

  NASA Implicit Bias video https://www.nasa.gov/offices/ocs/diversity-inclusion

Unconscious Bias and the Peer Review Process

- In keeping with NASA's core value of Inclusion, SMD is strongly committed to ensuring that the review of proposals is performed in an equitable and fair manner that reduces the impacts of any unconscious biases.
- Since cognitive biases are manifested as short-cuts in the decision-making process, making the evaluation process as explicit as possible helps to mitigate them. To this end, we instruct reviewers to:
  - Apply clear requirements/criteria/factors (merit, relevance, cost);
  - Emphasize the use of those criteria in panel discussions;
  - Present clear reasoning tied to those criteria to support the findings captured in the written panel evaluation.
- However, unconscious biases cannot be interrupted simply through training. Structural changes in the way proposals are written and reviewed are needed

  → the Dual-Anonymous Peer Review provides a framework for change.

General Overview of the DAPR Approach

What is Dual-Anonymous Peer Review?

- In the dual-anonymous peer review (DAPR), not only are proposers unaware of the identity of the members on the review panel, but the reviewers are not provided with explicit knowledge of the identities of the proposing team during the scientific evaluation of the proposal.
- The primary intent of dual-anonymous peer review is to eliminate “the team” as a topic during the scientific evaluation of a proposal, not to make it absolutely impossible to guess who might be on that team.
- DAPR’s goal is to create a shift in the tenor of discussions away from the people and institutions involved and to focus it on the intrinsic scientific/technical merit, NASA relevance, and cost reasonableness of the proposed investigation.

How Does DAPR Work?

Under the DAPR process, the standard review of proposals is split into two parts: a scientific evaluation and a validation of the proposer's expertise and resources.

Proposers are given instructions for preparing and submitting both: (1) an anonymized proposal document; and (2) a companion "Expertise and Resources Not Anonymized" (E&R) document.

Although the overall merit of each proposal will be assessed based only on the information provided in the anonymized proposal document, validation of the qualifications, track record, and access to unique facilities is still an important component of the process.

Summary of the Motivation for DAPR

The direct goal of the DAPR process is to create an environment that neutralizes the impact of unconscious bias on the peer review process by providing a framework that:

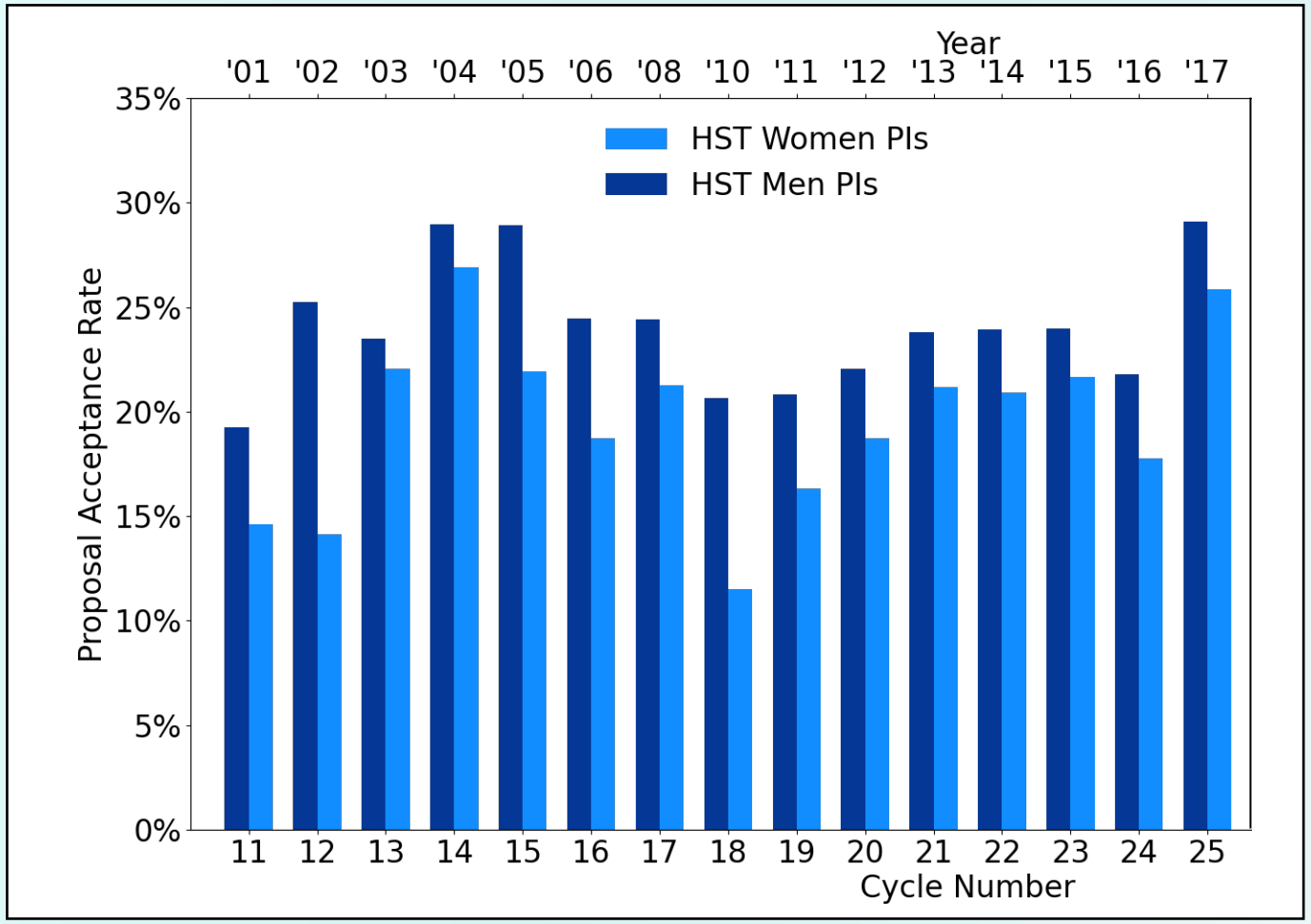
- focuses consideration on the explicitly-defined evaluation criteria provided by NASA; and
- reduces or eliminates consideration of other factors that are not salient to those evaluation criteria.

A natural outcome of reducing unconscious bias in the peer review is that it levels the playing field for all proposers by removing barriers that have traditionally limited the diversity of SMDs R&A programs in many different dimensions.

However, even if DAPR had no measurable effect on diversity, it would **STILL** be the right thing to do because it improves the rational decision-making process and yields reviews that are more objective and more firmly rooted in the stated evaluation criteria.

- Examples of the Impact of the DAPR Approach

Origin of NASA's DAPR process: The Hubble General Observer (GO) Program

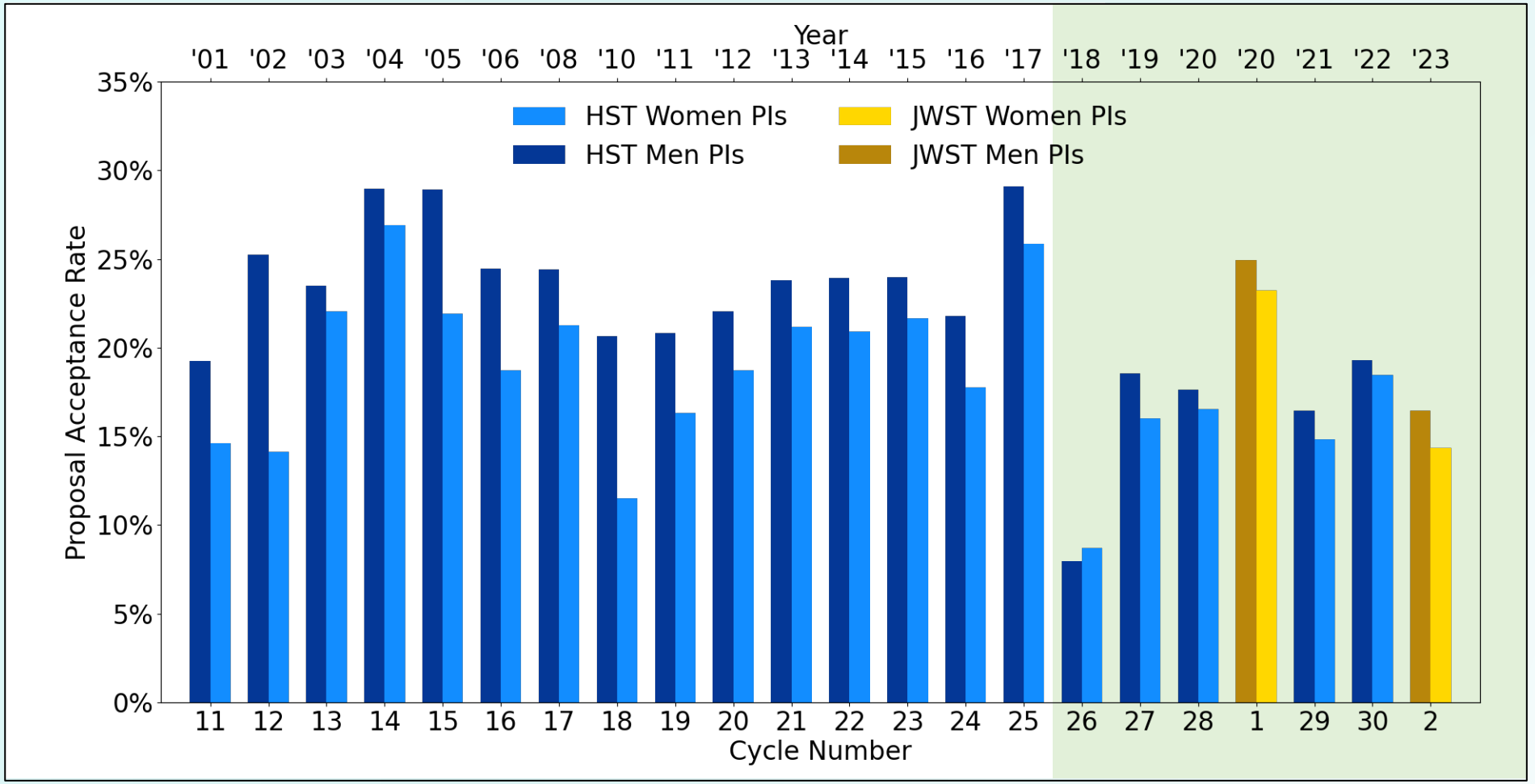


Analysis of 15 years of data from the Hubble GO program showed that the success rate of male-led Hubble GO proposals was consistently higher than that of female-led proposals by an average of 4.5% ± 2.6% (1σ).

To address this discrepancy, the Hubble GO team developed a model for conducting a dual-anonymous peer review and implemented it starting in 2018 (Cycle 26).

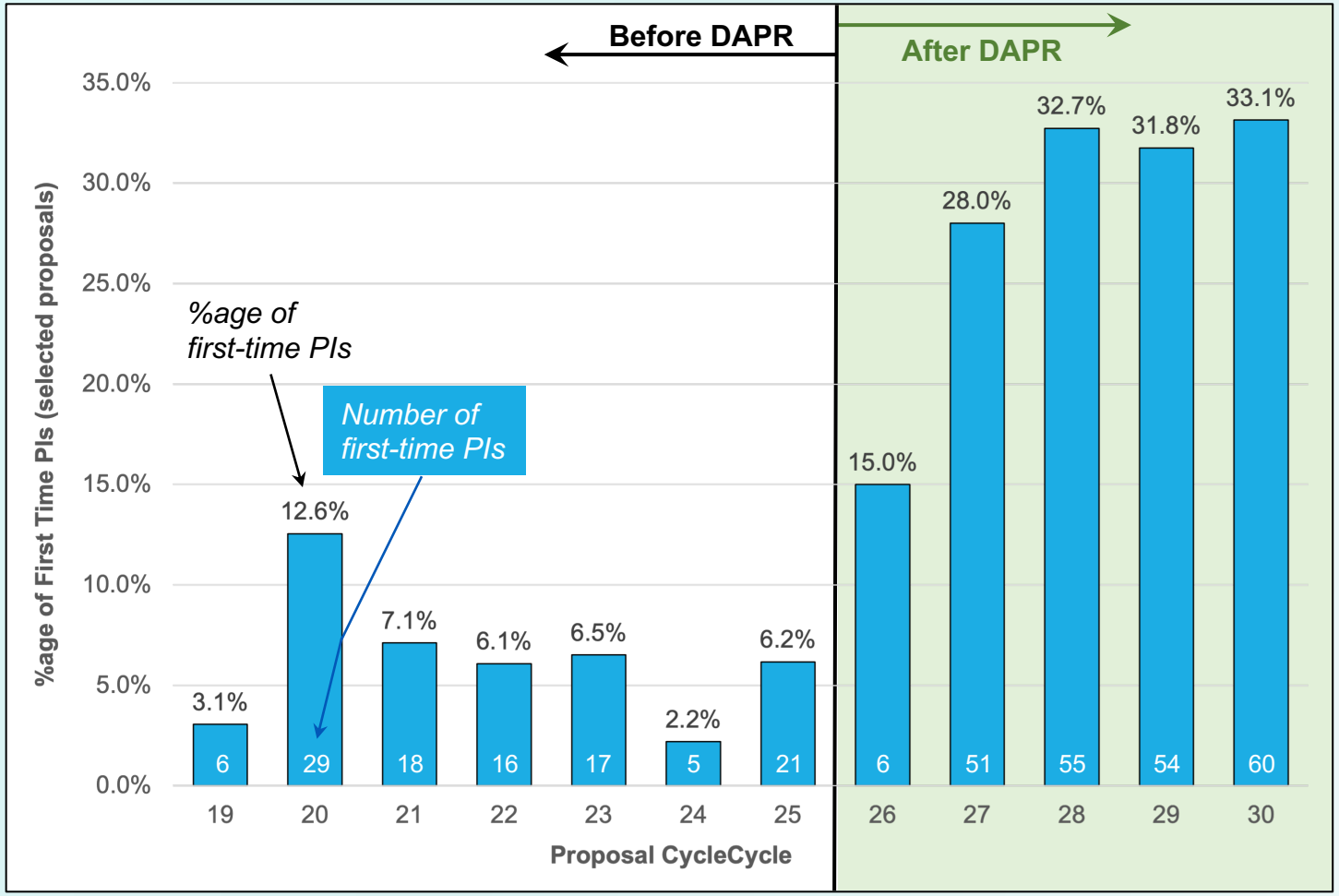
Origin of NASA's DAPR process: The Hubble General Observer (GO) Program

and JWST



In the 5 Hubble GO cycles since the adoption of the DAPR process and the first 2 JWST GO cycles, the disparity in the success rates of female-led and male-led proposals has been reduced by more than 70% to an average of 1.3% ± 0.6% (1σ).

A Further Example of the Impact of DAPR in the Hubble GO Program: The Fraction of First-Time PIs



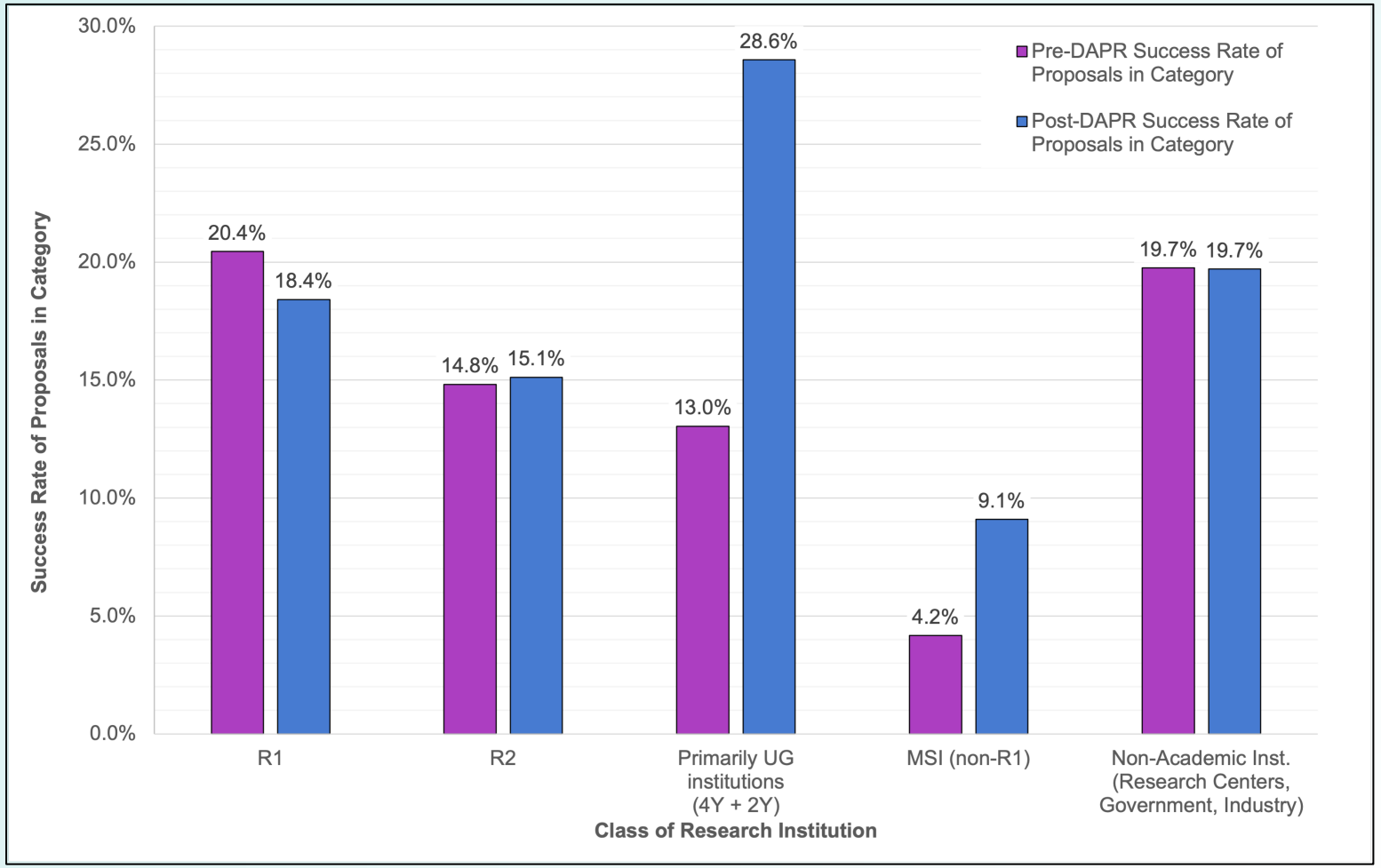
Since the adoption of the DAPR approach to their proposal review, the Hubble GO program has seen a sharp increase in the percentage of selected proposals that are led by first-time PIs.

An Example of the Impact of DAPR in SMD Programs: Institutional Success Rates of Astrophysics Proposals

This plot shows a comparison of the success rates of proposals from different classes of research institutions before and after the implementation of the DAPR.

The data come from the Astrophysics Data Analysis, Astrophysics Theory, and Exoplanets Research Programs.

- ~4500 proposals pre-DAPR
  - ADAP, ATP – 9 cycles
  - XRP – 3 cycles
  - Avg. success rate: 19.7%
- ~1000 proposals post-DAPR
  - ADAP – 3 cycles
  - ATP – 1 cycle
  - XRP – 2 cycles
  - Avg. success rate: 18.4%



Data courtesy of Nino Cucchiara and Màire Volz

Status of the DAPR Implementation Across SMD

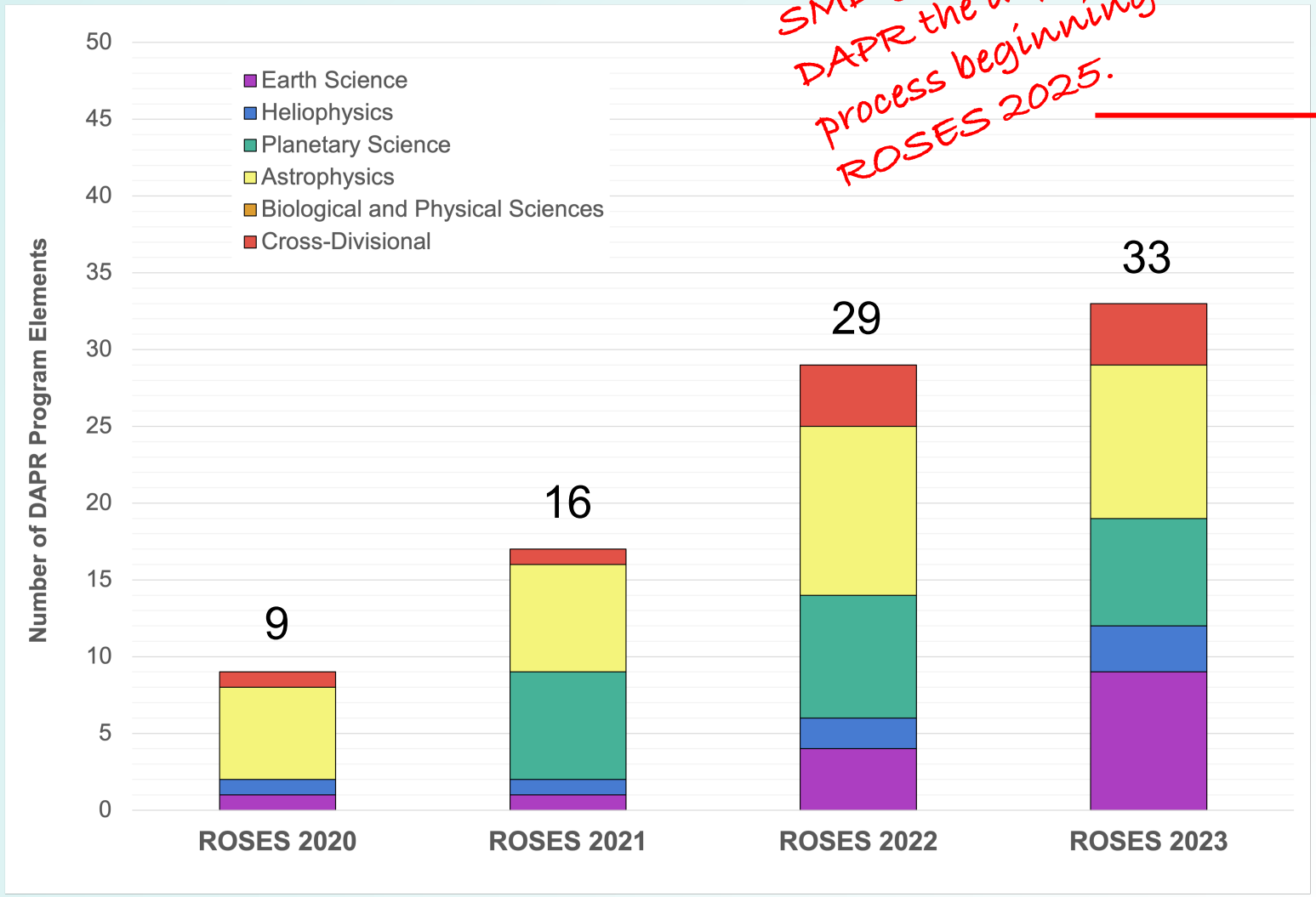
The Growth of DAPR in SMD

DAPR introduced in SMD under ROSES 2020 with a pilot involving 4 ROSES Program Elements

- Astrophysics also converted all it's mission Guest Observer/Guest Investigator (GO/GI) programs to DAPR (5 additional program elements)

Growth of DAPR has been steady

- 2020: ~10% of solicited programs
- 2021: ~20% of solicited programs
- 2022: ~30% of solicited programs
- 2023: ~37% of solicited programs

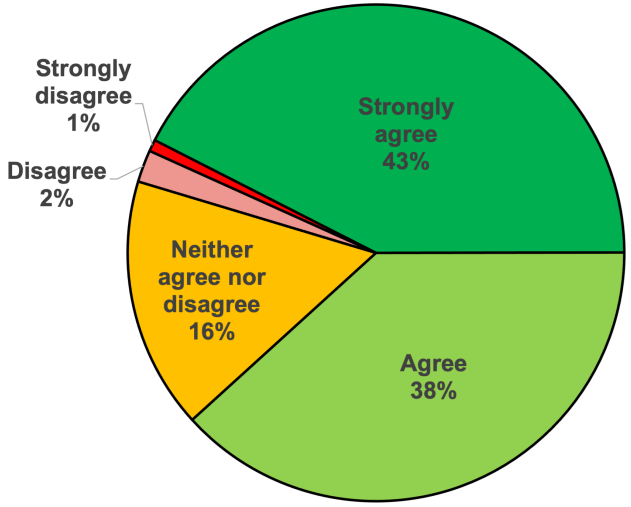


How is DAPR Received by Reviewers?

To date, surveys of reviewers conducted after the completion of DAPR panels has yielded 525 responses spanning 16 different programs over 4 years. The response is overwhelmingly favorable.

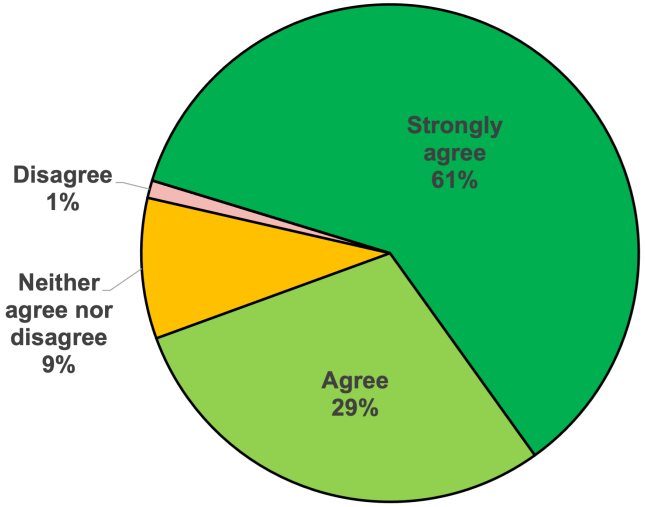
81% of respondents Agree or Strongly Agree with the statement:

"The DAPR procedure improved the overall quality of the peer review."



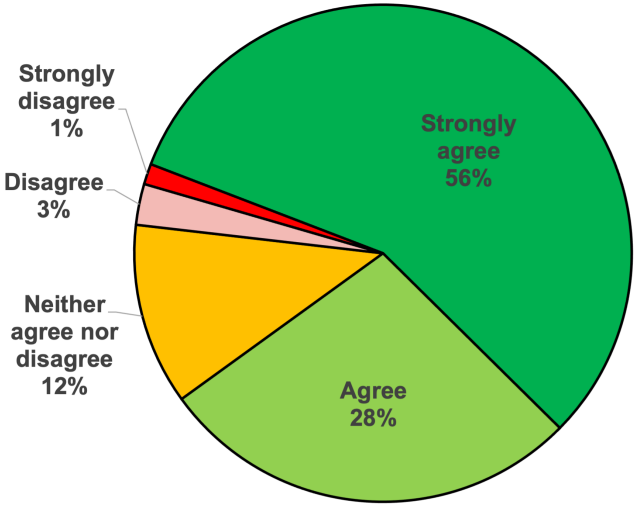
90% of respondents Agree or Strongly Agree with the statement:

"The DAPR procedure led to panel discussions being focused on the science rather than on the identities of the team members."



84% of respondents Agree or Strongly Agree with the statement:

"The Dual-Anonymous Peer Review process should be implemented in the future for the program I reviewed this year."




How do I make my proposal
DAPR-compliant?

How Do I Make My Proposal DAPR-Compliant?

Detailed instructions for preparing and submitting a proposal to a DAPR program are provided in the "*Guidelines for Proposers to ROSES Dual-Anonymous Peer Review Programs*" document.

- Available at https://science.nasa.gov/researchers/dual-anonymous-peer-review/
- Also linked to the solicitation page for each DAPR program element in NSPIRES
- A version of the *Guidelines* document tailored to the specialized requirements of Astrophysics GI/GO programs solicited under ROSES is also available.

In general, a proposal submitted to a ROSES DAPR program element will include three components:

1. An anonymized proposal document;
2. A separate "Expertise and Resources Not Anonymized" document;
3. A "Total Budget" document.**

** - *The submission of a separate "Total Budget" document is a general requirement for all ROSES program elements, DAPR or non-DAPR. The "Total Budget" document is not seen by reviewers and need not be anonymized.*

The Anonymized Proposal Document

The anonymized proposal document contains all the information necessary for a reviewer to assess (1) the scientific/technical merit, (2) the NASA relevance, and (3) the cost realism/reasonableness of the proposed investigation.

In general, the anonymized proposal document encompasses the following components:

a) Scientific/Technical/Management (S/T/M) section;
b) Reference section;
c) Open Science Data Management Plan (OSDMP);
d) Table of personnel and Work Effort;
e) Redacted Budget and Budget Justification

NOTE: *The specific requirements for anonymized proposals to different ROSES program elements may vary. Proposers should review the solicitation for their program of interest to ensure that they are aware of any program-specific requirements.*

The content of all sections of the proposal document must be anonymized in accordance with the instructions provided in the *Guidelines* document and in the associated ROSES program element.

Guidance for Preparing an Anonymized Proposal

Summary of some key elements for preparing a properly anonymized proposal:

- Reference callouts in the text must be written in numerical format (e.g. [1], [2], etc.)
- Do not claim ownership of past work or use possessive pronouns that indicate ownership, e.g., “…as we have shown in our previous work [17]” or "Recent results from our laboratory show…"
- Do not use the proper names of people or institutions anywhere outside of the reference list, including page headers/footers, figures/captions, etc.
- Do not use gendered pronouns anywhere in the anonymized proposal document.
- Avoid associating personnel with named teams or collaborations, e.g., “the PI is a member of the EAGLE collaboration.” (*MAY* be OK if large collaboration and team-member role is not specified—check with your program officer!)
- If necessary to cite exclusive-access datasets, non-public software, or other unpublished data, tools, or information, use language such as "obtained in private communication" in the reference to such potentially identifying work. However, do not identify with whom the personal communication took place.

Guidance for Preparing the “E&R” Document

The “Expertise and Resources Not Anonymized” (E&R) document contains information necessary for a reviewer to validate that the qualifications of the proposing team and the resources to which they have access are suitable for the proposed investigation.

In general, the E&R document may include some or all of the following components:

a) A list of all team members, their institutional affiliations, and their roles (e.g., PI, Co-I, collaborator).
b) A discussion of the expertise each team member brings to the investigation and the contribution that they will make to the proposed investigation.
c) A discussion of specific facilities, equipment, and/or other resources to which the team has access for to the proposed investigation, including letters of support, as appropriate.
d) A summary of work effort, including a non-anonymized version of the table of work effort presented in the anonymized proposal document.
e) CVs/bio sketches and statements of Current and Pending Support for PI and Co-Is.
f) Any other specialized documentation explicitly required by the individual program element.

Again, proposers should review the solicitation for their program of interest to ensure that they are aware of any program-specific guidance/requirements for the preparation of their E&R document.

How will my proposal be reviewed?

Flow of the Review

Reviewers have access only to the anonymized proposal documents while conducting the merit evaluation of each proposal.

After the written evaluations and rating of all proposals is completed, the "E&R" documents are distributed for those proposals that might reasonably be considered for selection.

Based on the E&R package, panels validate the qualifications of the team and the availability of any supporting resources needed to execute the proposed investigation.

Instructions to Panelists

1. Consider proposals solely on the scientific merit of the work proposed.
2. Do not spend any time attempting to identify the PI or the team. Even if you suspect you know the identities of the proposer(s),** discuss the science and not the people.
   - NASA-appointed Levelers are present in each panel room to ensure this doesn't happen
3. Keep in mind that language can be very important in discussing proposals.
   - Wherever possible, talk in terms of the work proposed, not in terms of the people doing the work;
   - When unavoidable, utilize appropriately neutral language (e.g.,"what they propose", or "the team has evaluated data").

** - *Reviewers are instructed never to share any suspicions they might have about the identity of the proposer(s) with other panelists; they are instructed to speak to the cognizant NASA Program Officer who will determine the proper course of action.*

Monitoring the Panel Discussion

- A NASA HQ representative is assigned to each panel to serve as a “Leveler” for panel discussions.
  - The leveler is present as a process monitor; they are not there to participate in the technical evaluation of proposals.
- The role of the leveler is to ensure that the panel discussions are focused on the evaluation criteria we provide and not on the perceived attributes of the proposer(s).
- If the discussion veers into an assessment of the perceived attributes of the proposer(s), their presumed past work, or their identities, the leveler’s job is to refocus the discussion.
- Levelers have the authority to stop the discussion on a proposal.

Validation of the E&R Document

1. Occurs only after scientific evaluation of the all proposals is completed.
2. The E&R Documents for those proposals that may potentially be part of the selection discussion are distributed to panelists.
3. After review, panelists categorize each team's qualification to execute their proposed research using a three-tier scale: ***Uniquely Qualified, Qualified, or Unqualified***
   - NASA sets the expectation that the vast majority of proposals will be categorized as ***Qualified***.
   - For proposals categorized as either ***Uniquely Qualified*** or ***Unqualified***, the panel must provide a written justification for their categorization. The panel may provide written comments for proposals categorized as ***Qualified***, if they choose to do so.
4. If the E&R Document for a proposal is evaluated by the panel, the associated E&R Validation form should be returned to the proposer together with the written panel evaluation form.
5. Neither the written findings in the panel evaluation form not the overall rating of the proposal can be changed as a result of the E&R Validation process.

Questions?

Contact Doug Hudgins (SMD DAPR Lead) at Douglas.M.Hudgins@nasa.gov

or the cognizant Program Officer for the ROSES Program Element to which you are interested in proposing.