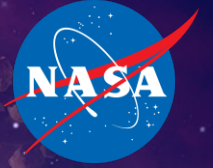


National Aeronautics and
Space Administration



EXPLORE SOLAR SYSTEM & BEYOND

**Dual-Anonymous Peer Review (DAPR) Update
For the Planetary Science Advisory Committee
November 15, 2021**

Delia Santiago-Materese, PSD Program Scientist



Making Peer Review Better

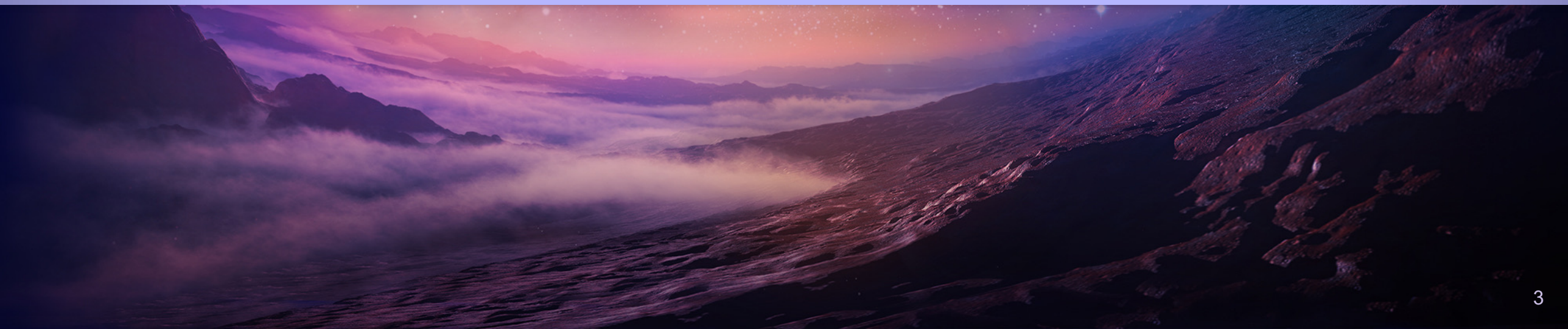
NASA's Science Mission Directorate (SMD) is strongly committed to ensuring that the review of proposals is performed in an equitable and fair manner.

To this end, and motivated by a successful study conducted for the Hubble Space Telescope, SMD is adopting dual-anonymous peer review (DAPR) for numerous programs.

Under this system, not only are proposers unaware of the identity of the members on the review panel, but the reviewers do not have explicit knowledge of the identities of the proposing team during the scientific evaluation of the proposal.



Motivation





1. It is difficult to completely interrupt bias through training.

2. Structural changes are also needed.

Double-Blind, aka Dual-Anonymous Review



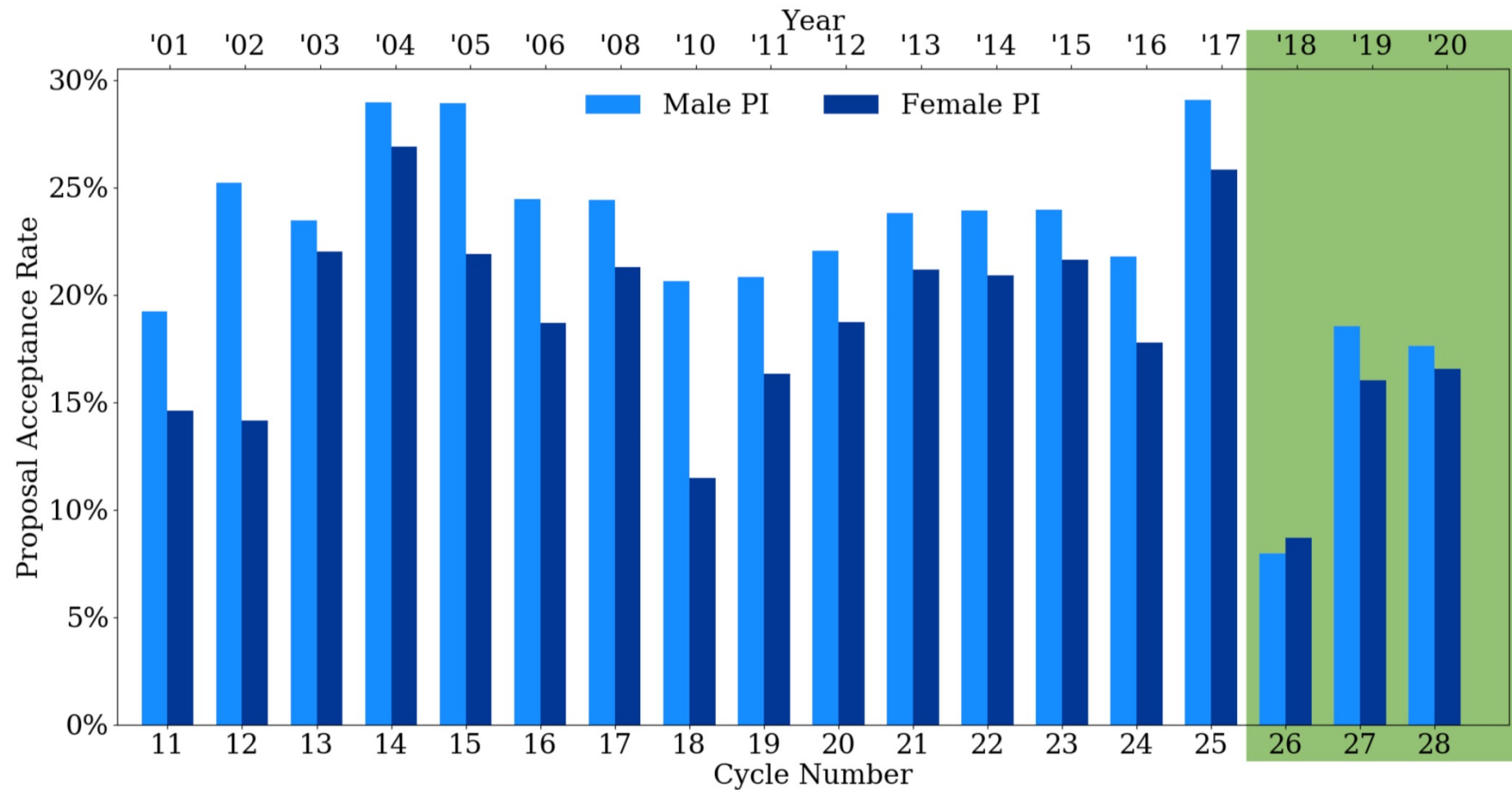
“In 1970, the top five orchestras in the U.S. had fewer than 5% women. Today, some... are well into the 30s.”

Behavioral Ecology switched to double-blind review, resulting in a significant increase in female first-authored publications



Hubble

Hubble Switch to Dual-Anonymous



Cycles 11-25
 $\langle \Delta \rangle = 5\%$

Cycles 26-28
 $\langle \Delta \rangle = 1\%$

Gender



A key goal of dual-anonymous peer review is to level the playing field for everyone.

We want to create a change in the tenor of discussions, away from the individuals on the proposing team, and toward the proposed science.

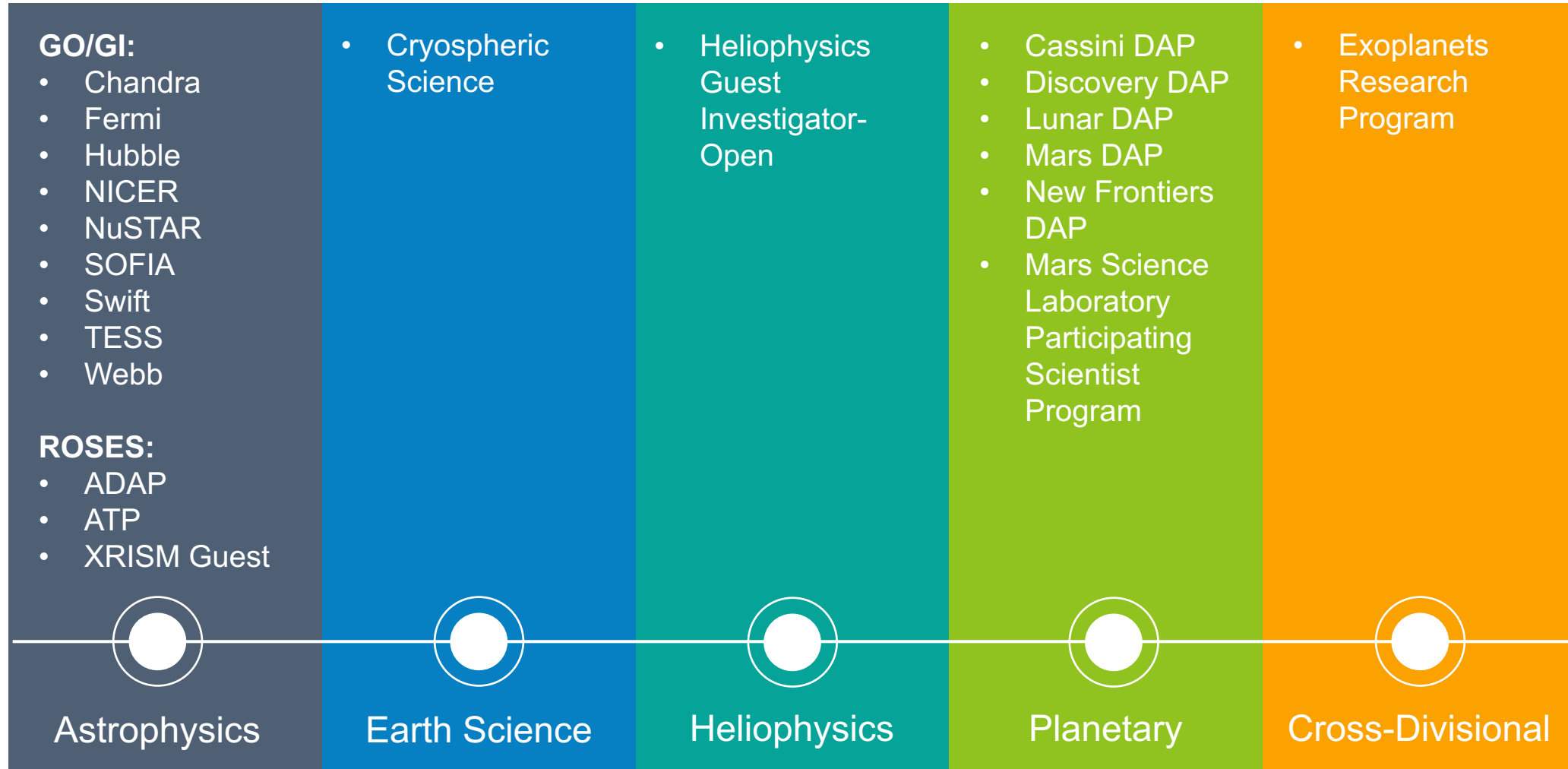
However, dual-anonymous peer review is not a silver bullet.



Which Programs Are Converting to Dual-Anonymous Peer Review?



2021 Dual-Anonymous Programs across SMD





Proposal and Review Process



Detailed Guidance



The program element text contains specific instructions on how to prepare an anonymized proposal for that program. In addition, the NSPIRES page of each program element contains a document entitled “Guidelines for Anonymous Proposals” describes in detail the specific requirements of anonymous proposals.



A quick-start tutorial, as well as frequently asked questions, may be found at:

<https://science.nasa.gov/researchers/dual-anonymous-peer-review>

A Town Hall was held prior to the first Planetary Science Division DAPR Program, Habitable Worlds under ROSES-2020, on October 7, 2020 with over 250 attendees.

Flow of the Review



The anonymized scientific review takes place. All assessments are complete, grades finalized, and panel summaries written.



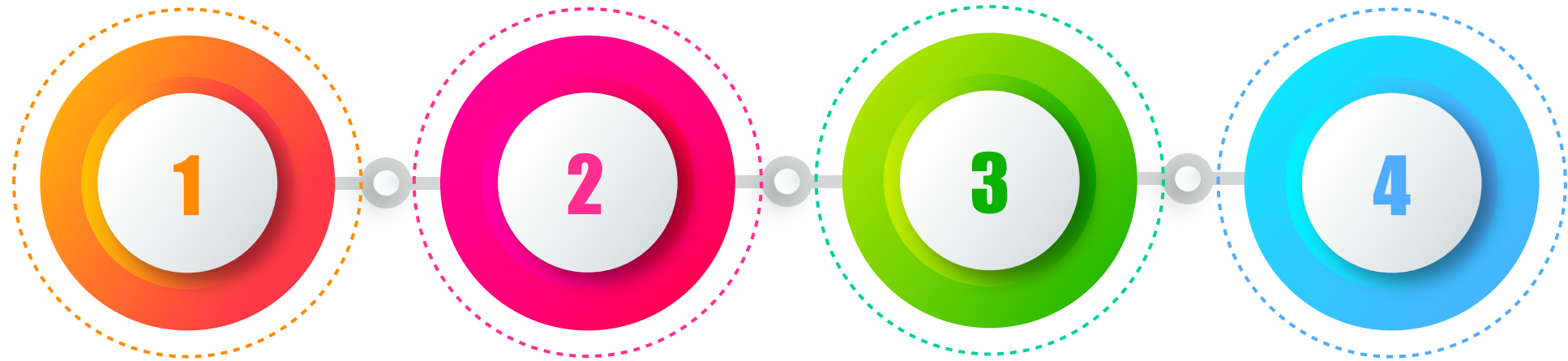
The “Expertise and Resources – Not Anonymized” document is distributed to panelists for a subset of proposals. Panelists assess the team and resource capability to execute the proposed investigation.



Success Metrics and DAPR Experience So Far



Success Metrics



99% OF PROPOSALS
SUBMITTED ARE
COMPLIANT

POSITIVE
REVIEWER
SURVEYS

CONSULTANTS
SAY REVIEWS
ARE FOCUSED
ON SCIENCE

REDUCTION IN
GENDER GAP
MEASURED OVER ~3
CYCLES

DAPR Status for PSD

Completed:

- Habitable Worlds (ROSES-2020)
- Exoplanet Research Program (ROSES-2021)
- Cassini Data Analysis Program (CDAP; ROSES-2021)

In-progress/ Future (all ROSES-2021):

- Four other Data Analysis Programs (DAPs; Discovery, Lunar, New Frontiers, and Mars)
- Mars Science Laboratory Participating Scientist Program (MSL PSP)



Compliance

Most proposals were in compliance with DAPR requirements.

Less than 2% of proposals were declined without review for egregious DAPR compliance issues (more proposals were rejected due to other compliance issues).

Numerous other DAPR non-compliances were observed; PIs received feedback on these issues as they arose in the form of letters or within the panel evaluations themselves

Common Pitfalls

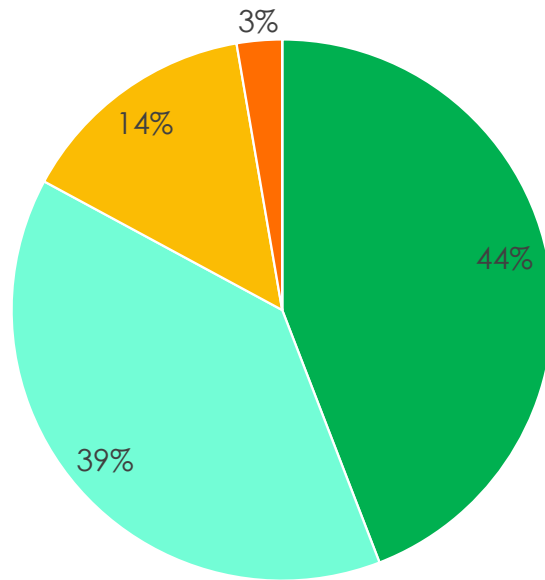
Common (minor) pitfalls we see in proposals about 10-15% of the time:

1. Claiming ownership of past work (e.g., "our previous analysis", "PI has an established record").
2. Including metadata (e.g., PDF bookmarks) that reveal the name of the PI.
3. Recycling proposals prepared prior to dual-anonymous peer review and not carefully anonymizing the text.
4. Providing the names of investigators on the contents page.
5. Providing the origin of travel for professional travel (e.g., conferences).
6. Mentioning the institution name in the Budget Narrative.
7. Including the PI or co-I names in budget tables.
8. Failure to follow the reference numbering scheme laid out for DAPR.
9. Accidental inclusion of names (inconsistently): (e.g. in one place in the proposal, it says "Co-I XX", while elsewhere it says "A co-I" or similar).



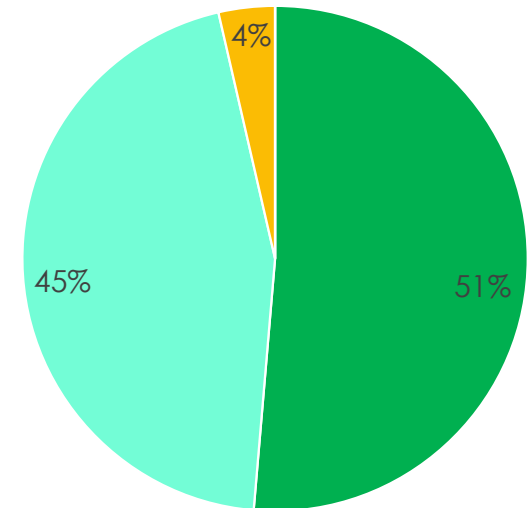
Reviewer Feedback

The Dual-Anonymous Peer Review procedure improved the overall quality of the peer review.



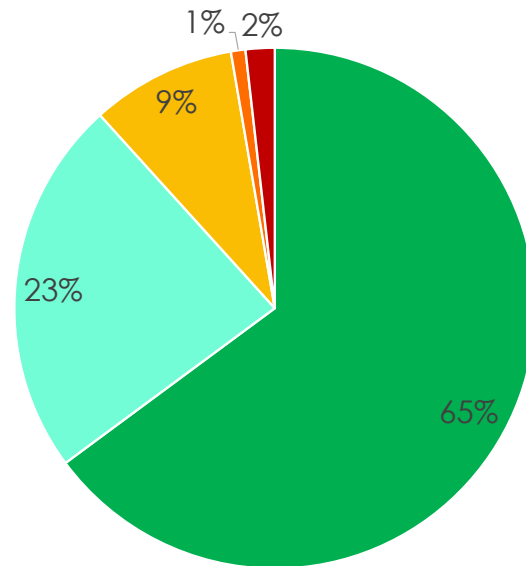
- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

The majority of proposals on my panel were prepared in accordance with NASA's guidelines for Dual-Anonymous Peer Reviews.



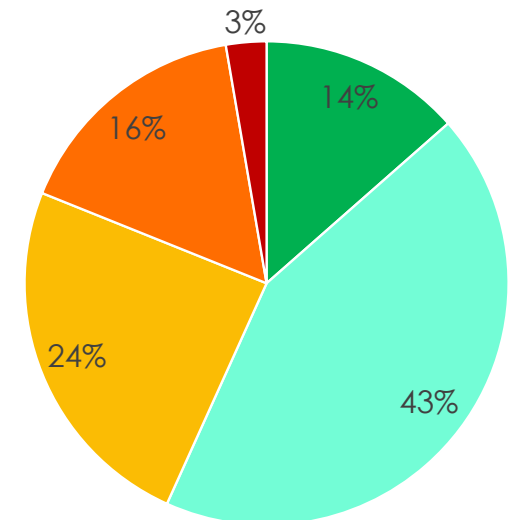
Reviewer Feedback (cont.)

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



- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

The "Expertise and Resources - Not Anonymized Document" reveal step was necessary for me to verify that the proposing team had the necessary capabilities to execute the proposed investigation.

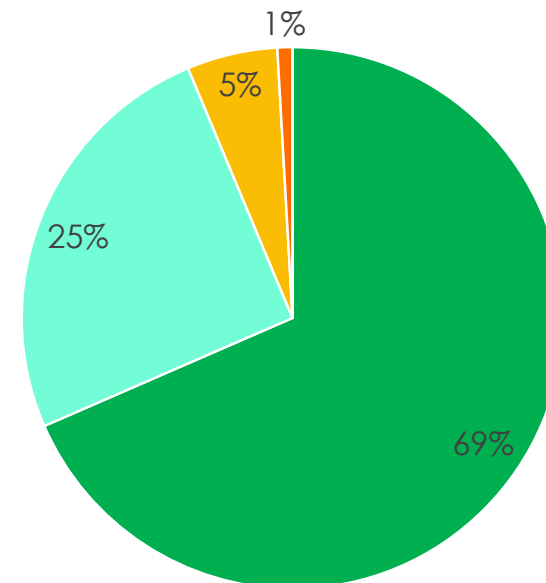




Reviews Focused on Science

- Strongly Agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly Disagree

The Dual-Anonymous Peer Review process led to panel discussions being focused on the science rather than on the identities of the team members.



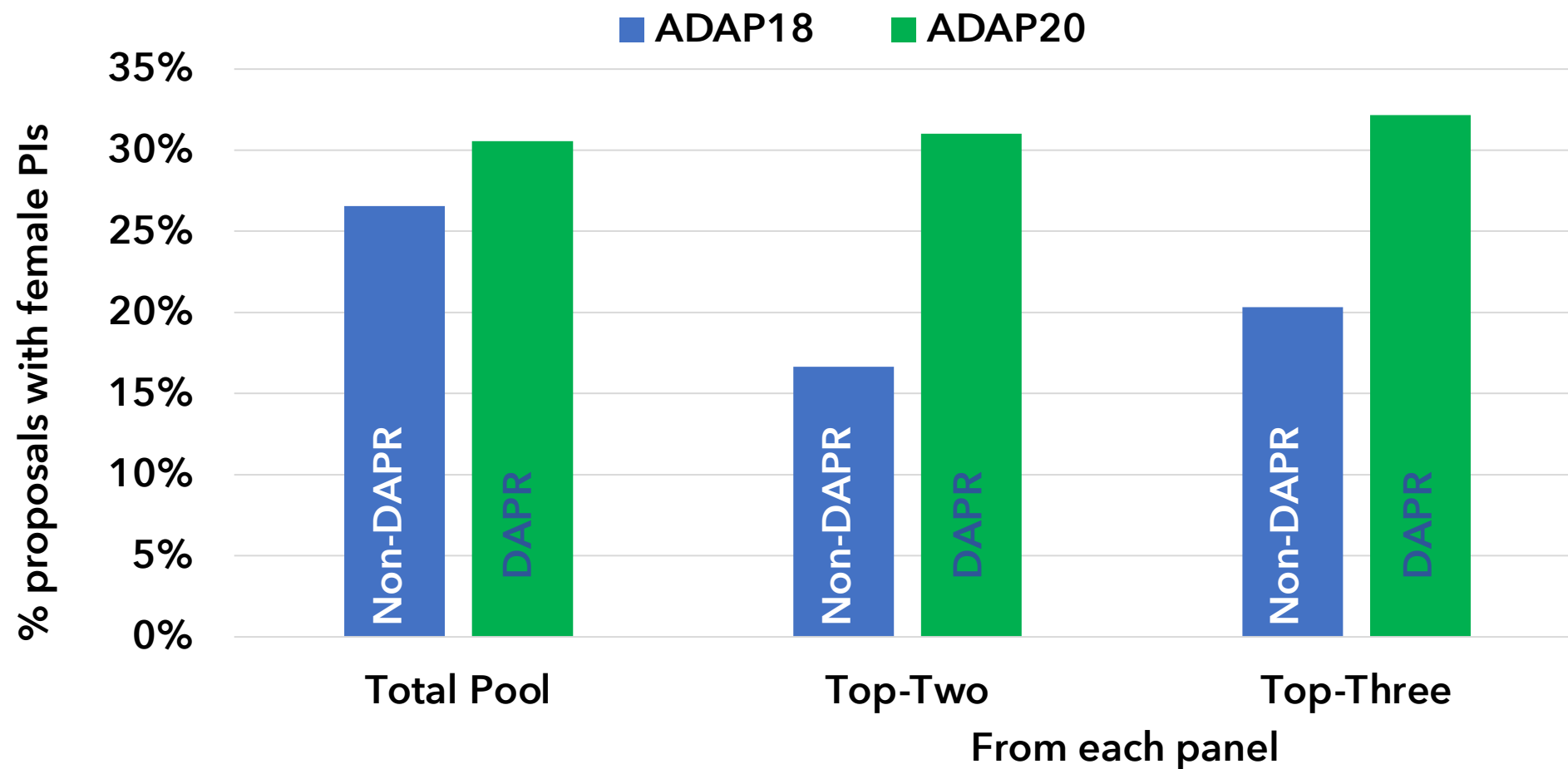


DAPR and the Gender Gap

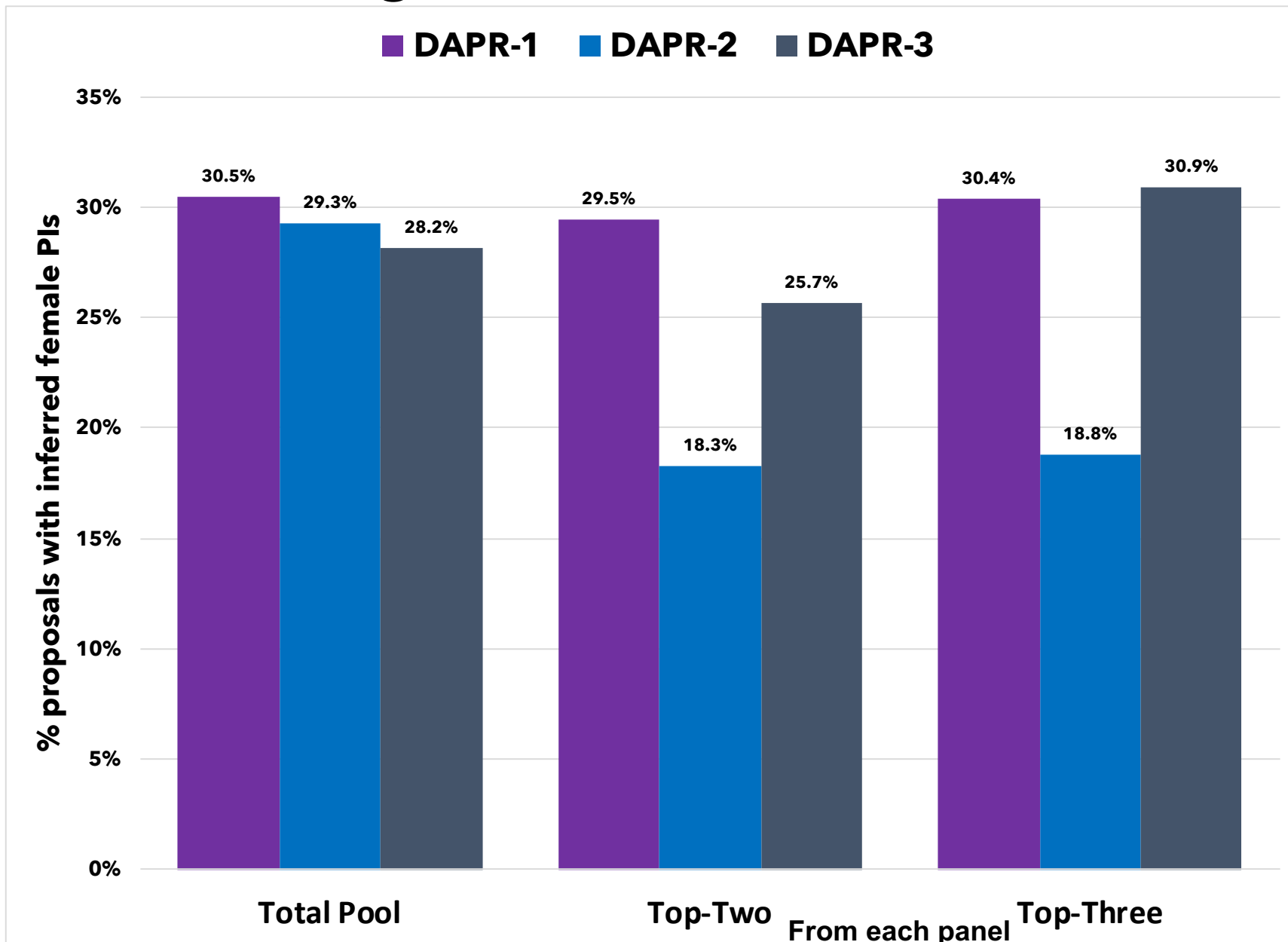
PSD's DAPR pilot, Habitable Worlds, and the successor DAPR programs, were chosen to be under the DAPR process for programmatic reasons, not because of demonstrated gender gaps.

There are other areas where DAPR might address implicit bias (first time PIs, institutions, etc.), which will be looked at in the future.

Recent Astrophysics Data Analysis Program (ADAP) Results

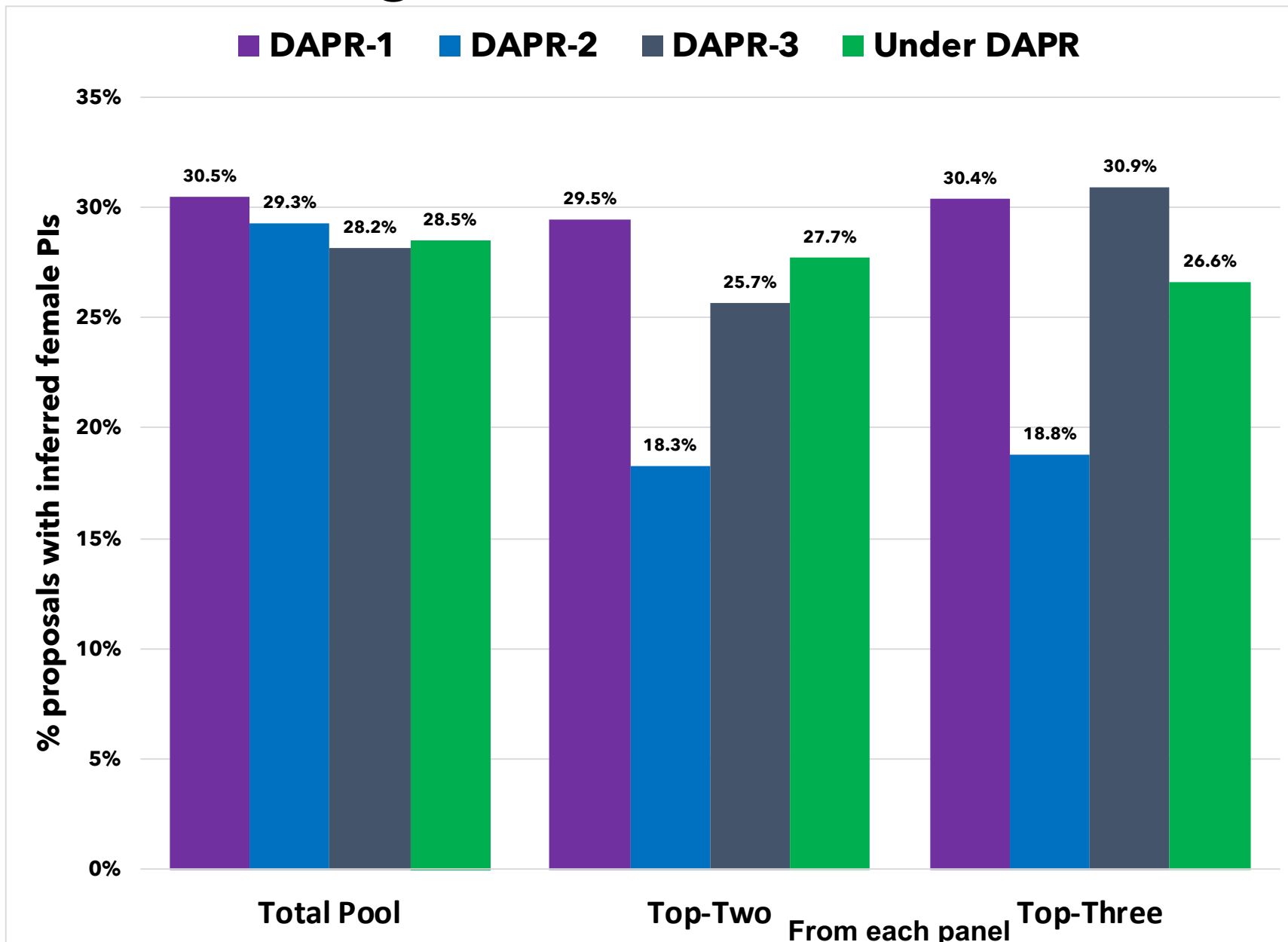


All PSD DAPR Programs to Date



DAPR-1 =
DAPR minus 1
ROSES year

All PSD DAPR Programs to Date



DAPR-1 =
DAPR minus 1
ROSES year



Anecdotes...

“DAPR was terrific. We really focused only on the science, and it was clear which proposals were the best before the ‘reveal’ step. This made clear that knowing who authors the proposal is really unnecessary, and that DAPR works!”

“I did not want to see the ‘reveal’ by the end of it, the only aspect I wanted to see in the appended documents were whether appropriate facilities and equipment were in place, which could have been easily explained in the proposal. There are few studies I think where a scientist is ‘uniquely’ qualified these days, and I think the DAPR increased the equity in how these proposals get reviewed, without relying on the laurels of more established and well known researchers.”

“I am almost sure some of the highly ranked proposals in my panel were not ranked so high if the panel knew the identity of PIs beforehand. DAPR is amazing in fighting the implicit biases.”



Final Remarks





Unique PSD perspectives

Some Planetary Science work relies on laboratory equipment, and some laboratory set-ups prove harder to anonymize.

Mission PSPs may have unique requirements that differ from other DAPR programs.

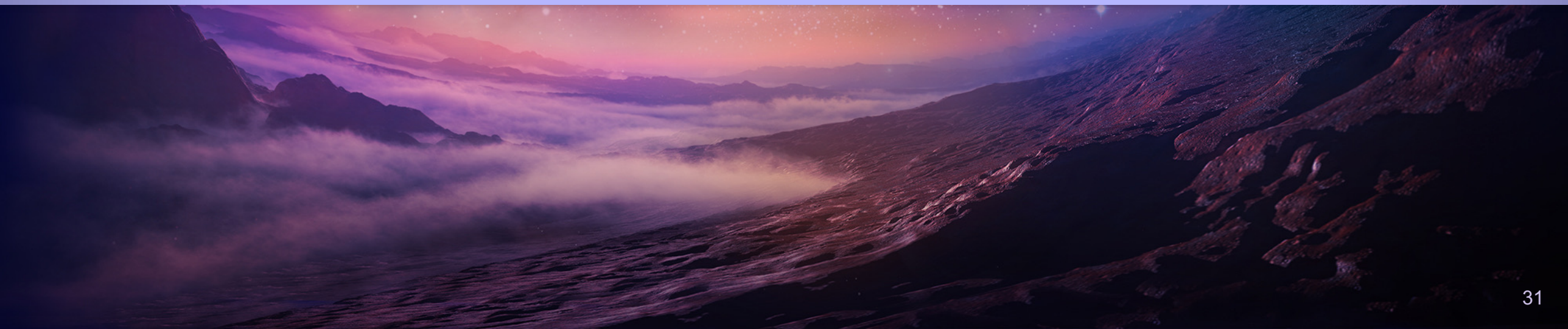
→ We always remember that the goal of DAPR is not to make it impossible to guess the identities of the proposers, but rather to shift the discussion away from people and towards the science.

Final Remarks

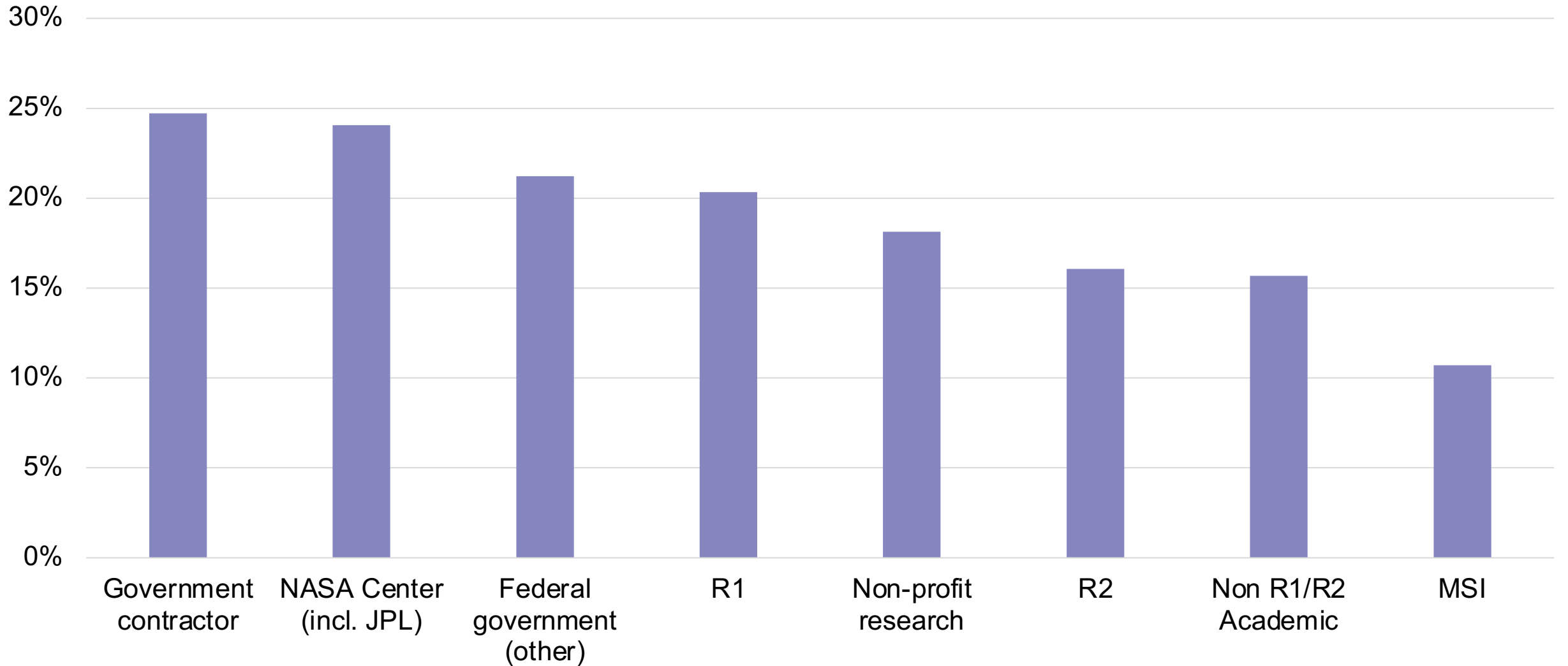
- NASA is proud to be leading in the implementation of dual-anonymous peer review for federal proposal evaluation.
- NASA understands that dual-anonymous peer review represents a major shift in the evaluation of proposals, and as such there may be occasional slips in writing anonymized proposals. However, NASA reserves the right to return without review proposals that are particularly egregious in terms of the identification of the proposing team.
- NASA further acknowledges that some proposed work may be so specialized that, despite attempts to anonymize the proposal, the identities of the Principal Investigator and team members are readily discernable. As long as the guidelines are followed, NASA will not return these proposals without review.
- We look forward to expanding dual-anonymous peer review in 2022 and beyond.



BACKUP



Success Rate by Institution Type for ROSES Programs Prior to 2020 SMD Pilot (ADAP + Earth USPI + Habitable Worlds + Heliophysics Guest Investigator)



Submission of Anonymized Proposals



Exclude names and affiliations of the proposing team, including in figures and references to personal websites.



Do not claim ownership of past work, e.g., “my previously funded work...” or “our analysis shown in Baker et al. 2012...”



Cite references in the passive third person, e.g., “Prior analysis [1] indicates that ...”.



Do describe the work proposed, e.g., “We propose to do the following...” or “We will measure the effects of...”



Include a separate not-anonymized “Expertise and Resources” document.

Example of Anonymization

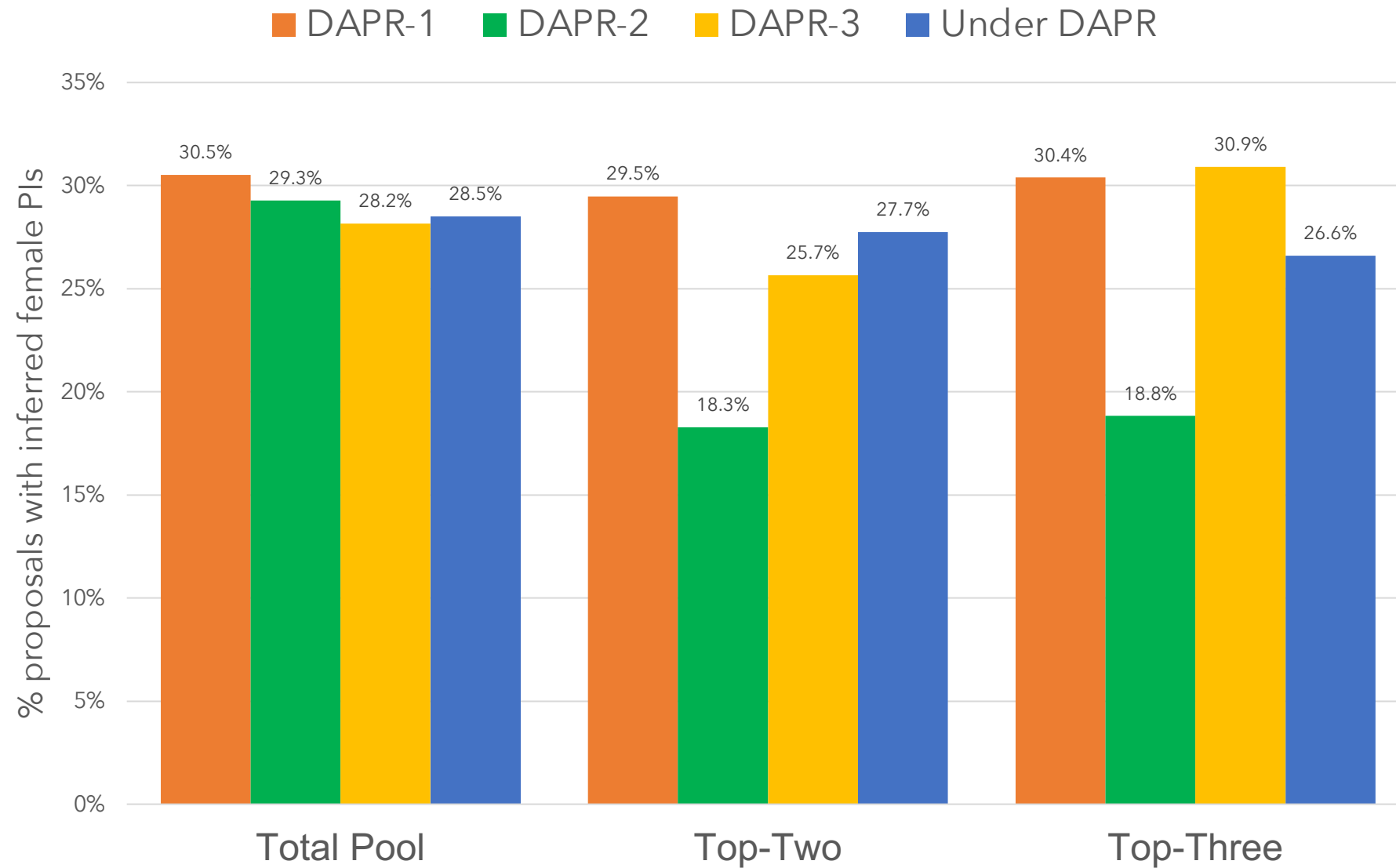
In Rogers et al. (2014), we concluded that the best explanation for the dynamics of the shockwave and the spectra from both the forward-shocked ISM and the reverse-shocked ejecta is that a Type Ia supernova exploded into a preexisting wind-blown cavity. This object is the only known example of such a phenomenon, and it thus provides a unique opportunity to illuminate the nature of Type Ia supernovae and the progenitors. If our model from Rogers et al. (2014) is correct, then the single-degenerate channel for SNe Ia production must exist. We propose here for a second epoch of observations which we will compare with our first epoch obtained in 2007 to measure the proper motion of the shock wave.

Here is the same text, again re-worked following the anonymizing guidelines:

Prior work [12] concluded that the best explanation for the dynamics of the shockwave and the spectra from both the forward-shocked ISM and the reverse-shocked ejecta is that a Type Ia supernova exploded into a preexisting wind-blown cavity. This object is the only known example of such a phenomenon, and it thus provides a unique opportunity to illuminate the nature of Type Ia supernovae and the progenitors. If the model from [12] is correct, then the single-degenerate channel for SNe Ia production must exist. We propose here for a second epoch of observations which we will compare with a first epoch obtained in 2007 to measure the proper motion of the shock wave.



All PSD DAPR Programs to Date



All PSD DAPR Programs to Date

