



Cycle 11

Distributed peer review

Proposal Handling Team
May, 2024

Goal of presentation



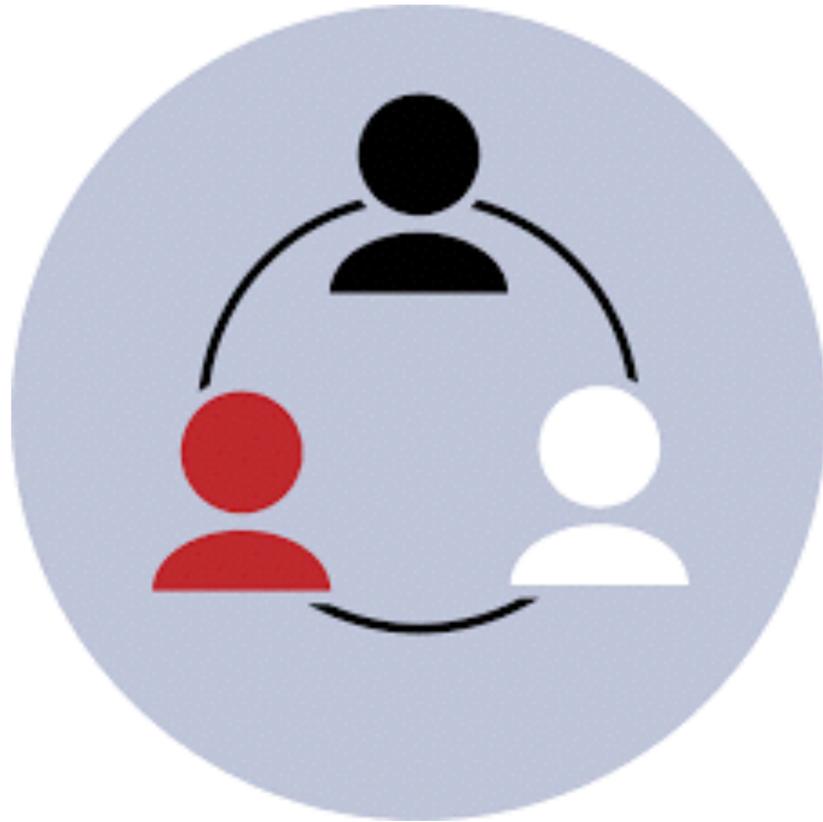
Logistics of distributed peer review



Guidelines to reviewing proposals

Logistics of distributed peer review

- ◆ Code of conduct
- ◆ Timeline of the process
- ◆ The Reviewer Tool
- ◆ Where do I find relevant information?



Code of conduct



Reviewers and mentors are expected to behave in an ethical manner

- Will judge the proposals solely on their scientific merit
- Will be mindful of bias in all contexts
- Will declare major conflicts of interest
- The proposal reviews will be constructive and avoid any inappropriate language



All proposal materials related to the review process are strictly confidential

- The assigned proposals may not be distributed or used in any manner not directly related to the review process
- Any data, intellectual property, and non-public information shown in the proposals may be used only for the purpose of carrying out the requested proposal review
- The assigned proposals and the reviews may not be discussed with anyone other than the Proposal Handling Team, or the assigned mentor when applicable
- All electronic and paper copies of the proposal materials must be destroyed as soon as a reviewer completes the proposal review process

Basics of distributed peer review



Every* proposal team nominates one person to be a reviewer



Proposal Handling Team (PHT) assigns 10 proposals to the reviewer



Reviewer ranks and write comments for each proposal

* Excluding Large Programs

Reviewer timeline for Cycle 11



April 25

Proposal deadline

- 1) Proposal PI designates the reviewer in Observing Tool (OT)

April 30

Expertise & conflicts

- 1) Reviewer specify scientific expertise in Preferences
- 2) Reviewer provide list of conflicts of interest in Preferences
- 3) Deadline to provide alternative reviewer, if necessary

May 8 - June 5

Stage 1

- 1) Plenary sessions May 9-14 (optional, and highly recommended)
- 2) Declare any conflicts of interest in assigned proposals by May 15
- 3) Complete reviews by June 5 @ 15 UT **(MANDATORY!)**

June 6 - June 20

Stage 2

- 1) Read reviews from other reviewers
- 2) Modify your ranks and comments as needed

Stage 1: Review assigned proposals



May 8 - June 5
Stage 1

- 1) Declare any conflicts of interest in assigned proposals by May 15
- 2) Complete reviews by June 5 @ 15 UT **(MANDATORY!)**



Proposal set

- Group of 10 proposals to review
- Assigned to the reviewer based on the reviewer selected expertise or the keywords of the reviewer's submitted proposal
- One Proposal Set is assigned for each submitted proposal on which someone was selected as the reviewer
- When the Proposal Sets are available to start the review process, all reviewers will be informed by email.

Stage 1: Review assigned proposals



May 8 - June 5
Stage 1

- 1) Declare any conflicts of interest in assigned proposals by May 15
- 2) Complete reviews by June 5 @ 15 UT **(MANDATORY!)**



Declare any additional conflicts in your assigned proposals

- *For example:* You are the PI on a proposal that is observing the same object(s) with the same goals as one of your assigned proposals

What is considered a conflict of interest?



- In general, a reviewer has a major conflict of interest when their personal or work interests would benefit if the proposal under review is accepted or rejected.



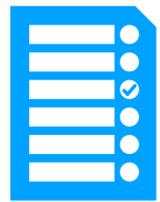
Before assigning the proposals, the PHT will identify major conflicts of interest based on:

- The PI, reviewer, or mentor of the submitted proposal is a PI or co-I of the proposal to be reviewed
- The PI, one of the co-PIs, or one of the co-Is of the proposal to be reviewed is in the conflicts-of-interest list provided by the reviewer or mentor of the submitted proposal
- If the list is not provided by the reviewer, or mentor, then the assignment algorithm constructs a list of conflicts based on the submission history of the reviewer, or the mentor.

What is considered a conflict of interest?



- In general, a reviewer has a major conflict of interest when their personal or work interests would benefit if the proposal under review is accepted or rejected.



Potential conflicts that are not identified automatically by the PHT:

- The reviewer is proposing to observe the same object with similar science objective.
- The reviewer had provided significant advice to the proposal team on the proposal even through they are not listed as and investigator
- Other reasons the reviewer believes there is a strong conflict of interest



Lack of perceived expertise is not a reason to declare a conflict of interest.

Stage 1: Review assigned proposals



May 8 - June 5
Stage 1

- 1) Declare any conflicts of interest in assigned proposals by May 15
- 2) Complete reviews by June 5 @ 15 UT **(MANDATORY!)**



Declare any additional conflicts in your assigned proposals

- *For example:* You are the PI on a proposal that is observing the same object(s) with the same goals as one of your assigned proposals



If you identify an additional conflict *after* you submitted your conflicts in Reviewer Tool, submit a Helpdesk ticket (“Proposal Review” department) to be assigned another proposal.

Stage 1: Review assigned proposals



May 8 - June 5
Stage 1

- 1) Declare any conflicts of interest in assigned proposals by May 15
- 2) Complete reviews by June 5 @ 15 UT (MANDATORY!)



- Rank the proposals from 1 (strongest) to 10 (weakest) based on scientific merit.



- Write comments that summarize the strengths and weaknesses of the proposal
- Comments will be sent to the PI verbatim.



- **Proposal associated with the Designated Reviewer will be canceled if the reviews are not submitted on time!**
- Extensions will not be granted since Stage 2 starts on June 6.



The reviewer can be changed after the proposal deadline in exceptional circumstances by having the proposal PI contact the PHT via Helpdesk. The Stage 1 deadline remains the same.

Stage 2: Finalize the ranks and reviews



June 6 - June 20
Stage 2

- 1) Read reviews from other reviewers
- 2) Modify your ranks and comments as needed



Read comments from the other reviewers to see if you overlooked any critical strengths or weaknesses.



Update your ranks and comments as needed.



Take advantage of Stage 2, and learn from other reviewers!

If a reviewer does not complete Stage 2, the Stage 1 ranks/comments are considered final.

The Reviewer Tool



<https://almascience.org/proposing/alma-proposal-review/reviewer-tool>

A screenshot of a web browser displaying the ALMA Reviewer Tool page. The browser's address bar shows the URL: https://almascience.org/proposing/alma-proposal-review/reviewer-tool. The page features a header with the ALMA logo and the text "Atacama Large Millimeter/submillimeter Array In search of our Cosmic Origins". Below the header is a navigation menu with links for "About", "Science", "Proposing", "Observing", "Data", "Processing", "Tools", "Documentation", and "Help". The main content area is titled "ALMA Reviewer Tool" and contains a large circular logo with the text "ALMA REVIEWER TOOL". Below the logo is the text "Click the logo to start". A paragraph of text explains that the Reviewer Tool is a web interface used by distributed peer review Reviewers to submit ranks and reviews during the proposal review process. It notes that Reviewers will need to log in with their ALMA credentials and provides a link to "How to Use the Reviewer Tool". At the bottom of the page, there is a link to "Return to the main ALMA Proposal Review page" and a footer with links for "Site Map", "Accessibility", "Contact", and "Privacy Statement", along with a "Region:" dropdown menu showing "EA", "EU", and "NA".

The Reviewer Tool

Confirmation of the Process



ALMA Reviewer Tool

By clicking below, I acknowledge that:

- All of the review materials that I will see as part of the review process are strictly confidential.
- I will behave in an ethical manner and will rank the proposals assigned to me based solely on their scientific merits.
- I will declare any perceived conflicts of interest on my assigned proposals by 15 UT May 15, 2024 in order to ensure timely reassignments for all Reviewers.
- The proposal(s) for which I am serving as a Reviewer will be rejected if I do not submit my ranks and reviews by 15 UT June 5, 2024.

The review process is described in detail at

<https://almascience.org/proposing/alma-proposal-review/distributed-peer-review>. In particular, Reviewers should review the guidelines describing:

- Review criteria
- Conflict criteria
- Unconscious bias
- Writing constructive comments to PIs

Accept

The Reviewer Tool Proposal set(s)



Reviewer Tool 2024.02 Help Profile

26 d 22 h 23 m 08 s

- You have been assigned a "Proposal Set" corresponding to the submitted proposal for which you are serving as a Reviewer.
- Click on the Proposal Set to accept or reject each of your proposal assignments based on your perceived conflicts of interest by May 15, 2024.
- You must submit all conflict decisions before you may start reviewing individual proposals.

[Submit conflict decisions](#)

Pending

2024.1.00001.S
Sun Test

[☰ Proposal Set](#)

The Reviewer Tool

Accepting or declaring conflicts on proposals



- Accept or reject each of your assignments based on your perceived conflicts of interest using the 'Accept' and 'Conflict' buttons.
- Guidance regarding conflicts can be found at .
- Conflict declarations must be submitted by May 15, 2024.

[← Back](#) [Submit conflict decisions](#) [Proceed to final submission page](#)

Ranked list of assignments, reviewed on behalf of Proposal Set 2024.1.00001.S — *Sun Test*

Assignment list for Submitted Proposal 2024.1.00001.S

	Code	Status	Title	
Details	2024.1.10011.S	Pending	Proposal title 1	Accept Conflict
Details	2024.1.10013.S	Pending	Proposal title 2	Accept Conflict
Details	2024.1.10184.S	Pending	Proposal title 3	Accept Conflict
Details	2024.1.10225.S	Pending	Proposal title 4	Accept Conflict
Details	2024.1.10270.S	Pending	Proposal title 5	Accept Conflict
Details	2024.1.10335.S	Pending	Proposal title 6	Accept Conflict
Details	2024.1.10639.S	Pending	Proposal title 7	Accept Conflict
Details	2024.1.11298.S	Pending	Proposal title 8	Accept Conflict
Details	2024.1.11454.S	Pending	Proposal title 9	Accept Conflict
Details	2024.1.11503.S	Pending	Proposal title 10	Accept Conflict

The Reviewer Tool

Beginning the reviewing process



To complete your ranks and reviews:

- Add a review for each proposal and (optionally) enter a comment to the JAO.
- Drag-and-drop each proposal to put your list into your preferred rank order from 1 (strongest) to 10 (weakest).
- Any Proposal Set can be submitted once all ranks and reviews within it are completed.

[← Back](#)
[Submit conflict decisions](#)
[Proceed to final submission page](#)

Ranked list of assignments, reviewed on behalf of Proposal Set 2022.T.10146.S — *Tracing the Flow into Dense Cores in High-Mass Star Forming Filaments*

Ranking (1=strongest, 10=weakest)	Code	Status	Title
1	Drag proposals here and put in rank order		

Assignment list for Submitted Proposal 2022.T.10146.S

	Code	Status	Title
Add Review	2022.T.10145.S	Ready to review	Proposal title 1
Add Review	2022.T.10186.S	Ready to review	Proposal title 2
Add Review	2022.T.10276.S	Ready to review	Proposal title 3
Add Review	2022.T.10486.S	Ready to review	Proposal title 4
Details	2022.T.10844.S	Conflicted pending decision	Proposal title 5
Details	2022.T.10985.T	Conflicted pending decision	Proposal title 6
Add Review	2022.T.11047.S	Ready to review	Proposal title 7
Add Review	2022.T.11366.S	Ready to review	Proposal title 8
Add Review	2022.T.11420.S	Ready to review	Proposal title 9
Add Review	2022.T.11707.S	Ready to review	Proposal title 10

The Reviewer Tool

Comments to the PI and to the JAO



Proposal 2024.1.11503.S

Assessment **Proposal Information**

Rank: 1

Comments to the PI ([click here for guidelines](#)) ⓘ

Strengths:

Weaknesses:

Comments to the JAO (optional and confidential)

Possible violation of dual-anonymous guidelines Possible violation of PDF format Technical comment Other

Close

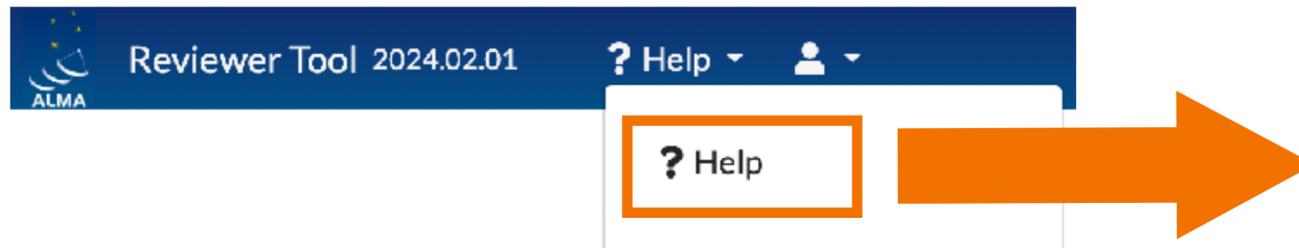
It is important to provide a constructive comment to the PI here. It will be sent verbatim to the PI. *(More to come in the next part of this presentation.)*

Reviewers can use “Comments to the JAO” to provide confidential comments to the JAO. For example:

- Possible violations to the dual-anonymous guidelines
- Possible violations to the PDF format and/or minimum font size
- Concerns about the observational setup
- Other topics that you would like to share with the PHT

The Reviewer Tool

Where to find help



A screenshot of the ALMA Reviewer Tool main page. The header features the ALMA logo and the text 'Atacama Large Millimeter/submillimeter Array In search of our Cosmic Origins'. Below the header is a navigation menu with links for 'About', 'Science', 'Proposing', 'Observing', 'Data', 'Processing', 'Tools', 'Documentation', and 'Help'. The main content area is titled 'Distributed Peer Review' and contains a paragraph explaining the review process. Below this is a section titled 'Basic rules' with a numbered list of six rules. On the right side, there is a 'Proposal Review Table of Contents' with links to 'ALMA Proposal Review', 'Dual-anonymous Guidelines', 'Distributed Peer Review', 'Guidelines for Reviewers', 'How to use the Reviewer Tool', 'Reviewer Tool', and 'Frequently Asked Questions'.

Distributed Peer Review

All proposals submitted to the Main Call that request less than 50 h on the 12-m Array or less than 150 h on the 7-m Array in standalone mode will be peer reviewed using a distributed system, in which a designee from each proposal team participates as a reviewer in the review process.

Basic rules

1. All participants in the review process must behave in an **ethical manner**. If it is found that a reviewer has not behaved in an ethical manner or did not complete their reviews in good faith, the proposal(s) on which the reviewer is acting as the designated reviewer may be rejected.
2. Each proposal must designate one reviewer to participate in the review process. The designated reviewer may be the PI of the proposal or one of the co-Is.
3. To keep the workload to a manageable level, it is recommended that reviewers review at most three Proposal Sets. Thus, PIs who are planning to submit multiple proposals are encouraged to designate one of their co-Is as the reviewer. The maximum number of Proposal Sets that a reviewer can be assigned is **FIVE**. This maximum number is not yet enforced by the OT but will be checked by the PHT after the proposal deadline. If a reviewer has been selected to receive more than five Proposal Sets, the reviewer will be contacted by the PHT to designate another reviewer among the proposal co-Is. If the reviewer does not identify alternative reviewers by 30 April 2024, 15:00 UTC, the PHT will reject the reviewer's proposal/s with the highest proposal code/s until the maximum allowed number of Proposal Sets to review is reached.
4. The reviewer must be specified in the Observing Tool (OT) at the time of proposal submission. The reviewer can be changed after the review process has started only in exceptional circumstances (e.g., medical emergency, urgent care for family member). A PI can request to change the reviewer through the [ALMA helpdesk](#) by opening a ticket to the department called "Proposal Review Support". If the PHT approves the request, the new reviewer will be given access to the assigned proposals and will assume responsibility for completing the review. The Stage 1 deadline for the new reviewer will remain the same because the Stage 2 process starts shortly after Stage 1 is completed.
5. PIs who do not have a PhD may be selected as the designated reviewer. In such cases, a mentor must be specified who will assist the PI in the review process. The mentor does not need to be part of the proposal team, but must have a PhD in astronomy or a related field, and must have an ALMA account since the mentor must be specified in the OT at the time of proposal submission. Co-Is who do not have a PhD are not eligible to be selected as reviewers.
6. Mentors will be able to access the assignments and reviews of their mentees through the Reviewer Tool in read-only mode.

Proposal Review Table of Contents

- [ALMA Proposal Review](#)
- [Dual-anonymous Guidelines](#)
- [Distributed Peer Review](#)
- [Guidelines for Reviewers](#)
- [How to use the Reviewer Tool](#)
- [Reviewer Tool](#)
- [Frequently Asked Questions](#)

The Reviewer Tool

Where to find help



A screenshot of the ALMA website. The top navigation bar includes 'About', 'Science', 'Proposing', 'Observing', 'Data', 'Processing', 'Tools', 'Documentation', and 'Help'. The 'Help' menu is open, showing options: 'Knowledgebase/FAQ', 'Helpdesk', 'EA ARC', 'EU ARC', and 'NA ARC'. An orange arrow points from the 'Helpdesk' option to a separate window. The main content area shows the 'Distributed Peer Review' section with a paragraph of text and a list of 'Basic rules' containing six numbered items. A sidebar on the right contains links for 'Distribute', 'Guidelines', 'How to use', 'Reviewer', and 'Frequently'.

A 'Submit Helpdesk Ticket' form. It includes a header with an envelope icon and the title 'Submit Helpdesk Ticket'. Below the header is a paragraph: 'Please complete this form and one of our agents will reply to you by email as soon as possible.' The form contains several input fields: 'Name *' with the value 'Adele Plunkett', 'Email' with a dropdown menu showing 'aplunket@nrao.edu', 'CC' (empty), 'Department *' with a dropdown menu showing 'Proposal Review Support', 'Subject *' (empty), and 'Message *' (empty). The 'Department *' field is highlighted with an orange border.

Relevant information



<https://almascience.org/proposing/alma-proposal-review>

- Dual-anonymous guidelines
- Description of the distributed peer review
- Detailed guidelines for the reviewers
- FAQ

Relevant information



Home — ALMA Science Portal x +

almascience.nrao.edu

Atacama Large Millimeter/submillimeter Array
In search of our Cosmic Origins

About Science Proposing Observing Data Processing Tools Documentation Help

Science Highlight

The ALCHEMI atlas: principal component analysis reveals starburst evolution in NGC 253

Results from a spectral scan survey of the central molecular zone of the nearby starburst galaxy NGC 253

ISM properties of the central molecular zone of the nearby starburst galaxy NGC 253 was investigated using the ultra-wide millimeter spectral scan survey. With this dataset, Harada et al. presented an atlas of velocity-integrated images at a 1".6 resolution of 148 transitions from 44 species (Astrophys. J. Suppl. 271, 38 (2024)). This includes the first detection of HCNH+ and the first interferometric images of C3H+, NC, HCS+ in an external galaxy. A principal component analysis shows correlations between molecular line intensities at different sky positions: Young starbursts tend to have peaks of high-excitation transitions of

Observatory News

Statement on Cycle 11 Call for Proposals deadline Issues
Apr 30, 2024

Upcoming Release of Observatory Project Data for HD 163296 in Band 1
Apr 10, 2024

Upcoming Release of Observatory Project Data for HL Tau in Band 1
Apr 03, 2024

Upcoming Release of Observatory Project Data for HL Tau in Band 3
More...

ALMA Status

Configuration Schedule

Refereed publications: 3777
Last observed source: G323.449+00.095
Current configuration: C-3
More...

NRAO Events

Cycle 11 ALMA Proposal Preparation Workshops in March-April, 2024
Mar 25, 2024

International Symposium on Space Terahertz Technology on April 7-11, 2024
Mar 25, 2024

20th Synthesis Imaging Workshop
May 15-22, 2024
Mar 25, 2024

Spatio-spectral modeling of
More...

The ALMA Science Portal is a one-stop source for information and tools aimed at the scientific community as a whole, including proposers, archive researchers, ALMA staff, journalists, and funding agencies.

Quick Links

ALMA Basics	Configuration Schedule
ALMA Science	SnooPI



Questions?





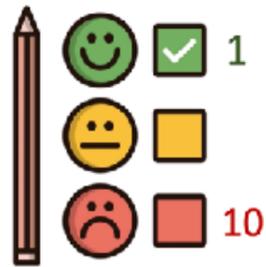
Guidelines to reviewing proposals

- ◆ Goals
- ◆ Review criteria
- ◆ Best practices for writing reviews
- ◆ Lessons Learned from prior cycles

Goals



Goals of the proposal review



- Establish a ranked list for all assignments within a Proposal Set



- Provide a comment to the PI with the strengths and weaknesses for each assigned proposal in a Proposal Set

How long will this take?



- You should plan to spend about 1-2 working days to review one Proposal Set

Proposal components



Abstract



Scientific Justification



Technical Justification



All three components are important and should be read by the reviewers.

Review criteria



Overall scientific merit

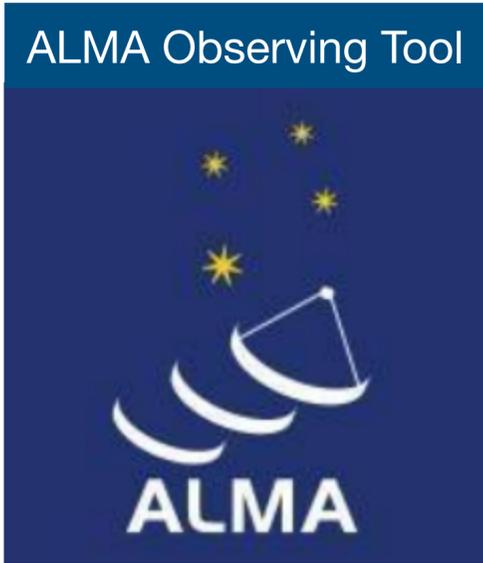
- Does the proposal clearly indicate which important, outstanding questions will be addressed?
- Will the proposed observations have a high scientific impact on this particular field and address the specific science goals of the proposal?
- Does the proposal clearly describe how the data will be analyzed in order to achieve the science goals?



Suitability of the observations to achieve the scientific goals

- Is the choice of target (or targets) clearly described and well justified?
- Are the requested signal-to-noise ratio, angular resolution, largest angular scale, and spectral setup sufficient to achieve the science goals?
- Does the proposal justify why new observations are needed to achieve the goals?
- For Joint Proposals, does the proposal clearly describe why observations from multiple observatories are required to achieve the science goals?

Technical Justification



Observing Tool performs (most) technical validations

- ➔ reviewers can assume requested sensitivity, angular resolution, largest angular scale, and correlator setup are valid and can be achieved technically.

Reviewers should evaluate if setup is sufficient to achieve science goals.



Sensitivity

Correlator setup

Largest angular scale

Angular resolution



The proposal should clearly justify the setup with references as appropriate.

A note for Cycle 11 reviews



For some proposals requesting Bands 7-10, the observing time listed on the proposal cover sheet may not match what a PI wrote in the Scientific Justification or Technical Justification.

This issue was fixed after the proposal deadline, and the automatically generated observing times listed on the proposal cover sheet and in the Technical Justification tables are now correct. When performing your review, please disregard any inconsistencies in the observing time written in the Scientific Justification or Technical Justification.



SCIENCE CATEGORY: ISM, star formation and astrochemistry					
ESTIMATED 12-M TIME:	27.8 h	ESTIMATED 7-M TIME:	0.0 h	ESTIMATED TP TIME:	0.0 h
DUPLICATE OBSERVATION JUSTIFICATION:					

Special cases



Reviewers should review **all proposals** following the same review criteria

- Resubmissions

If the proposal is accepted any science goals which have already been observed will be descoped by the JAO

- High-risk/high-impact

Reviewers are encouraged to give full consideration to well-designed high-risk/high-impact proposals even if there is no guarantee of a positive outcome or definite detection

- Proposal size

A proposal should not be down/up graded solely based on the amount of requested observing time.

Best practices for writing reviews



- Summarize both strengths and weaknesses
- Avoid giving the impression a minor weakness was the cause of a poor ranking
- Take care to ensure strengths and weaknesses do not contradict each other



- Do not ask questions in your review
- Questions usually indicate a proposal weakness - state the weakness directly



- A proposal review is NOT just a summary of the proposal
- While the reviewer may include a BRIEF (~ 1 sentence) summary, the bulk of the contents need to discuss the strengths and weaknesses of the proposal

Best practices for writing reviews



- Be as specific as possible when writing reviews
- Avoid generic statements that could apply to most proposals
- Critique the proposal and not the PI or the proposal team



- Use complete sentences when writing the comments
- Be concise, it is not necessary to write a lengthy review, but avoid writing a single sentence



- Be professional and constructive
- Do not use sarcasm or any insulting language

Best practices for writing reviews



- Do not include statements about scheduling feasibility
- Do not include explicit references to other proposals that you are reviewing, such as project codes
- Maintain anonymity
- Proof-read your reviews

Example review

Strengths: Jets and outflows have been shown to be a common phenomenon during the protostellar phase, but details about the exact mechanism in the type of source proposed here are not fully known. **The proposed target is very well justified and given its proximity, will provide excellent spatial resolution to study the structure of the outflow. The observations and analysis described will shed light on the physics of jet launching and accretion, leading to a better understanding of the evolution of this type of source.**

Weaknesses: However, the proposal did not adequately explain how the proposed observations will test whether the observed phenomenon is a result of the particular outflow launching mechanism or other scenarios discussed in the proposal. Also, the proposal did not adequately explain why the requested number of molecular transitions are needed for the proposed excitation analysis, compared with the pros and cons of instead observing fewer or different transitions.

Brief summary of proposal

Strengths specific to the proposal

Weaknesses specific to the proposal

Comments should indicate the strengths/weaknesses of the proposal, not the PI or the proposal team.

Unconscious bias



Unconscious bias in the review process is when a reviewer holds a bias (of which they are often unaware) in favor of, or against, a proposal for reasons other than scientific merit.

Examples include: culture, age, prestige, language, gender, and institutional bias.

ALMA is committed to awarding telescope time purely on the basis of scientific merit. As reviewers:

- Be aware of unconscious bias
- Keep your review factual and as objective as possible

To further reduce any potential bias ALMA implemented dual-anonymous review in Cycle 8.



Dual-anonymous



Remember the role of reviewers is to evaluate the scientific merit of the proposal:

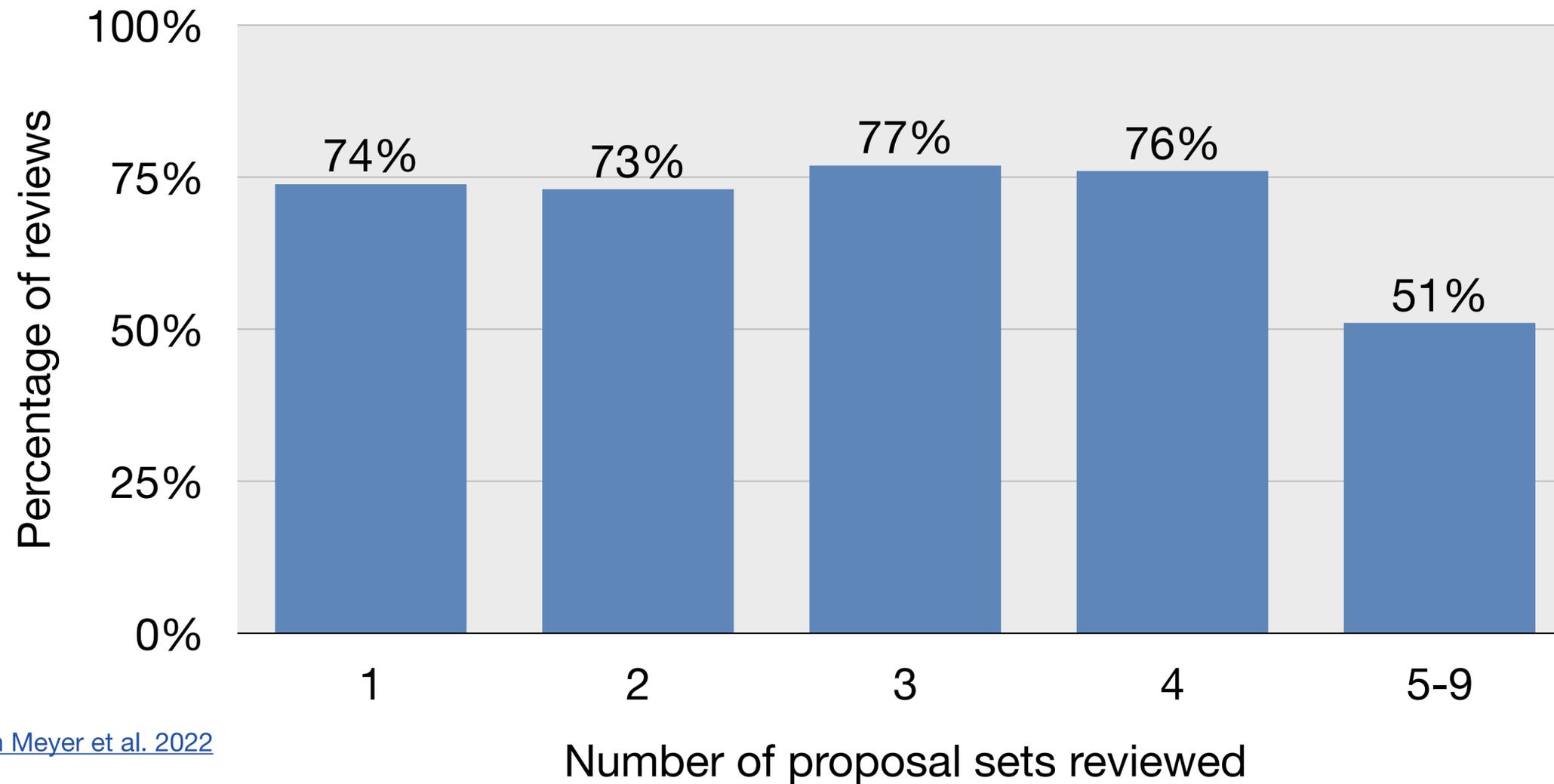


- Review the proposal based on the scientific merit
- Do not try to guess the identity of the PI or the proposer team
- If a proposal does not follow the dual-anonymous guidelines:
 - Review it solely by its scientific merit
 - Inform the PHT using the box "Comment to JAO" via the Reviewer Tool

Review workload



Helpfulness of a review vs. number of proposal sets reviewed in Cycle 8



[Donovan Meyer et al. 2022](#)

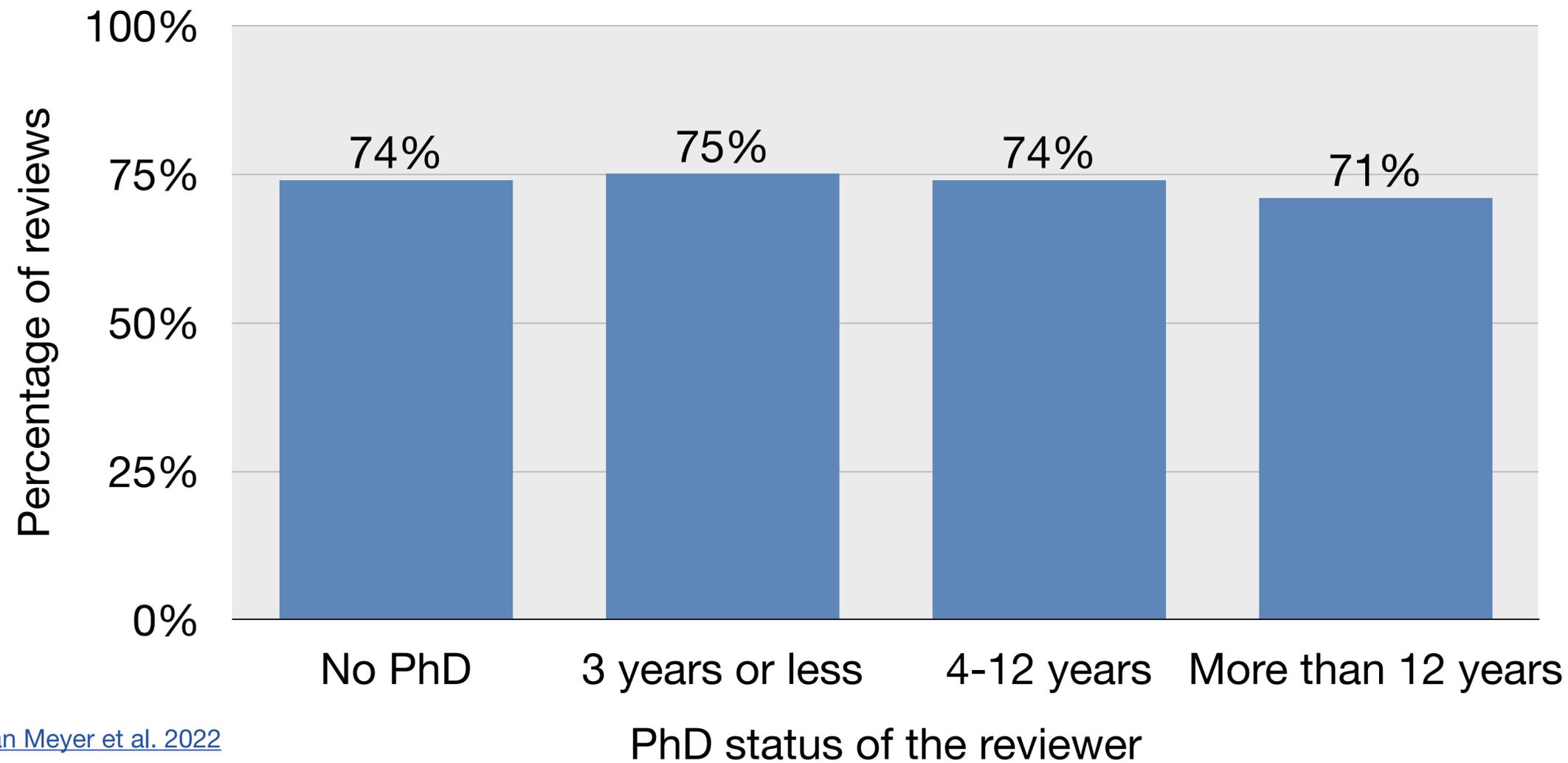


If you have many Proposal Sets to review, be sure to allocate sufficient time to review them all satisfactorily.

Everyone can write helpful reviews!



Helpfulness of a review vs. career status of the reviewer in Cycle 8



[Donovan Meyer et al. 2022](#)

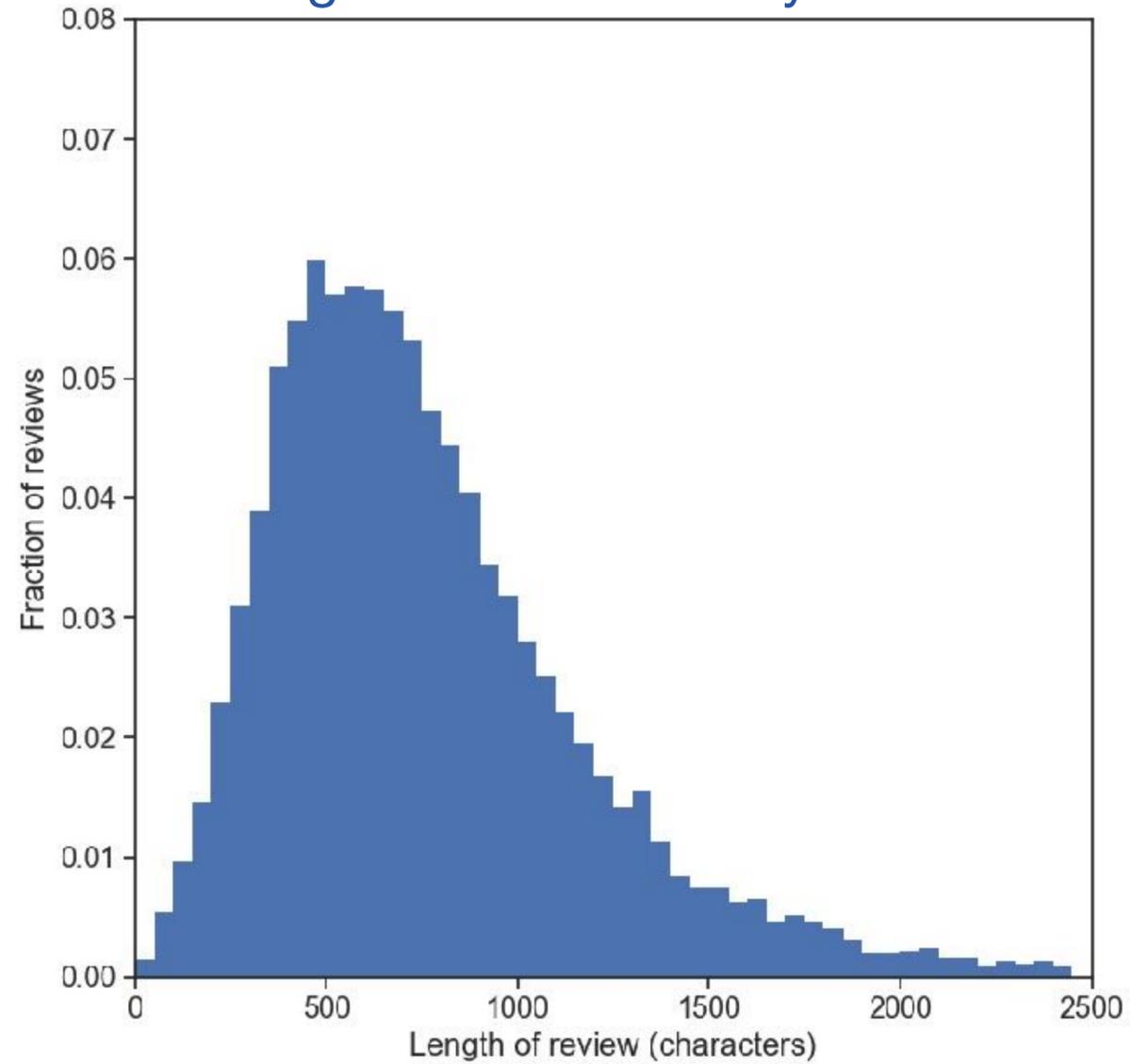


Students and young postdocs write just as helpful reviews as more experienced astronomers.

Length of review



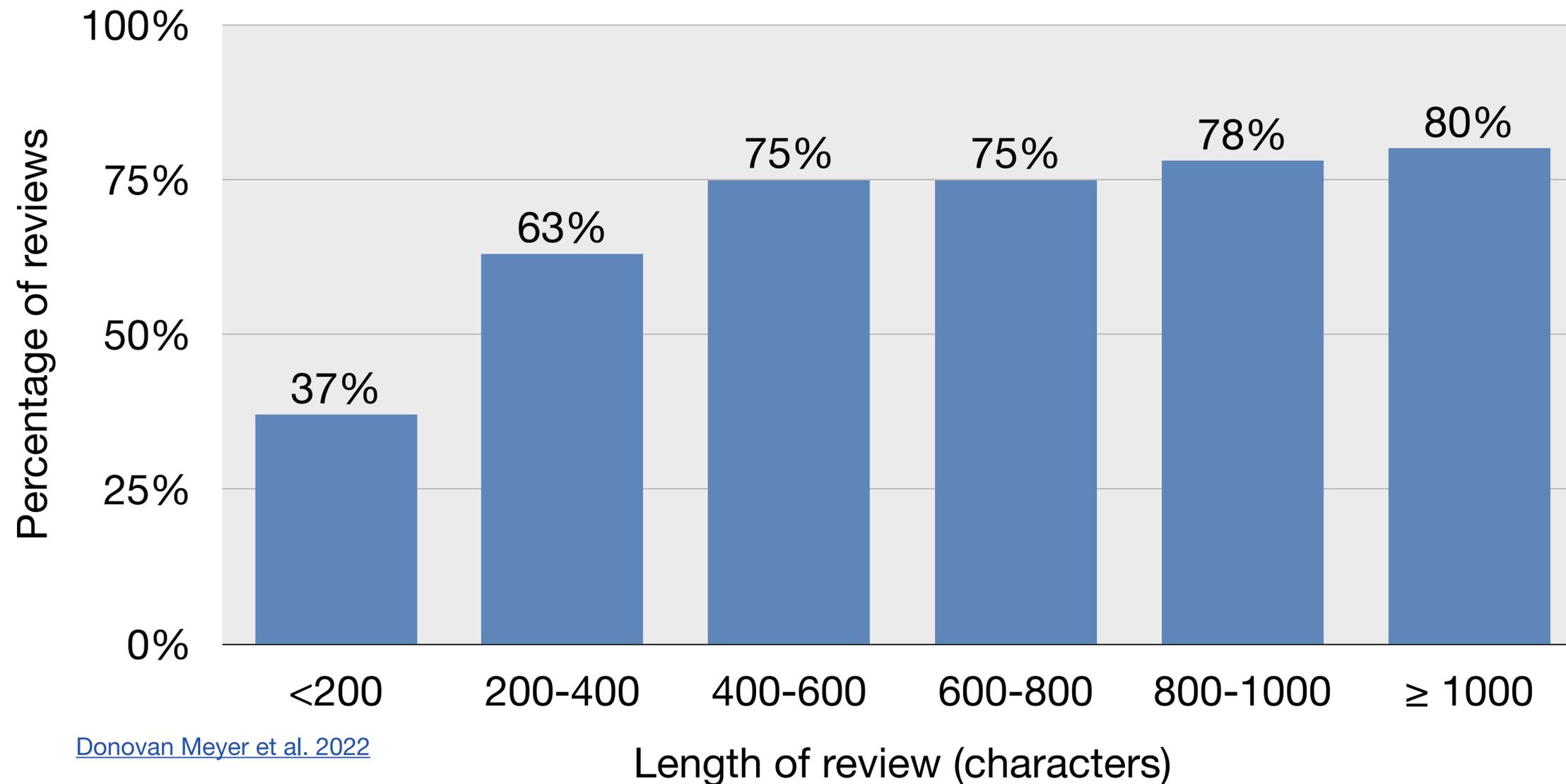
Length of reviews in Cycle 8



- Typical length of a review is ~700 characters, or about 6 sentences.

Length of review

Helpfulness of a review vs. length of the comment to PI



[Donovan Meyer et al. 2022](#)



Questions?

