



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

Cycle 3 Results and Cycle 4 Plans

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on behalf of the STScI Science Policies Group

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Cycle 3 Peer Review Results



Submissions

- The JWST Cycle 3 GO/AR deadline was on October 25 2023
 - A total of 1931 submissions were received by this date. One proposal was withdrawn after the deadline
 - 17 Proposals found to be non-compliant and are excluded from these statistics
- The 1913 Reviewed proposals include
 - 618 proposal led by ESA PIs (32.3 %)
 - 62 proposals led by Canadian PIs (3.2%)
 - 25955 Co-investigators in total
 - 5450 Unique investigators (PI, co-PI & co-I)
- Representation from
 - 57 Countries
 - 47 US states + DC

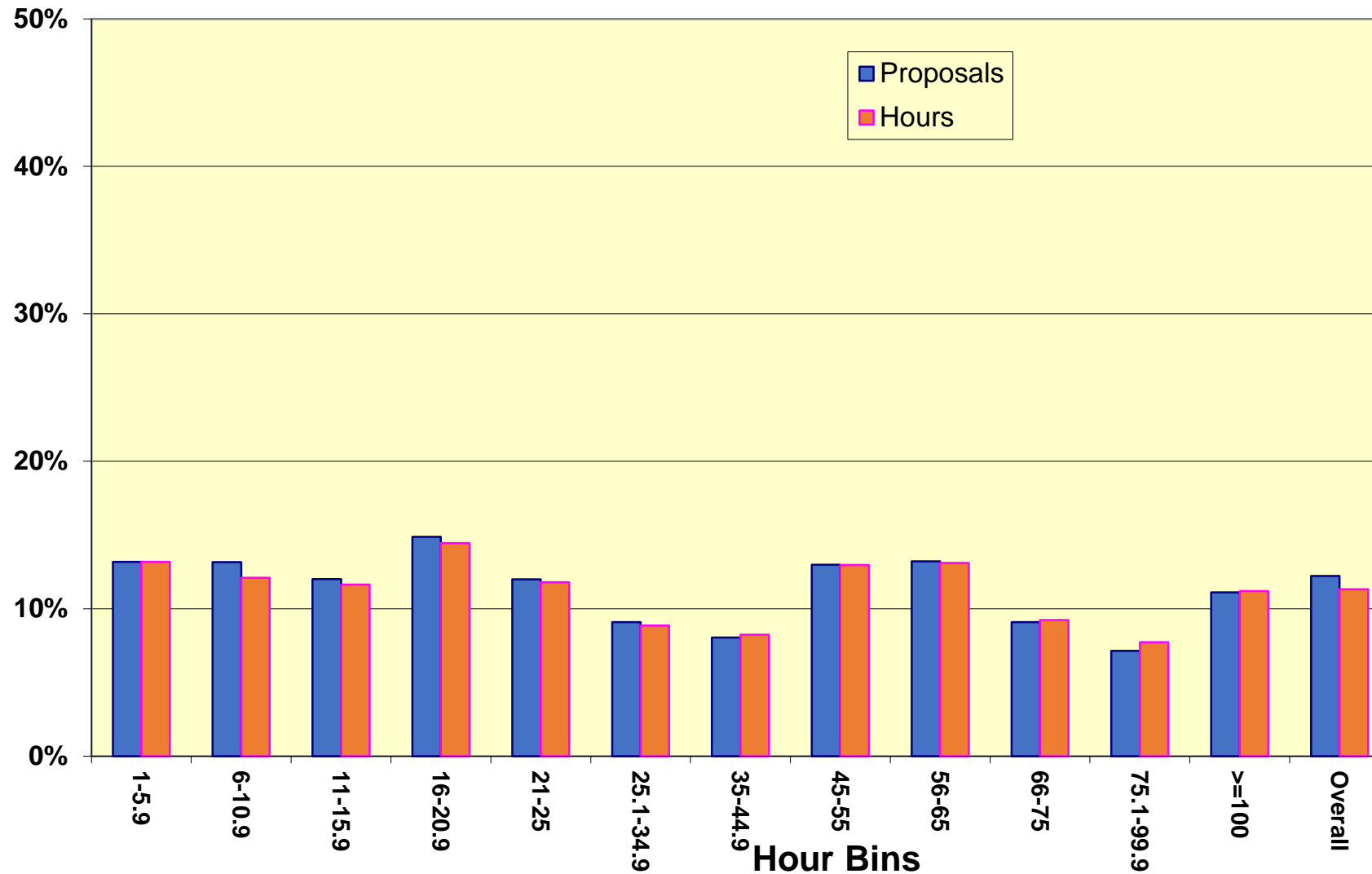


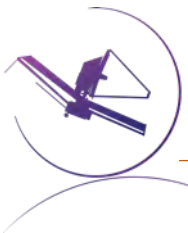
Executive Summary

- Dual anonymous
 - 13 proposals were rejected for non-compliance and excluded from discussion and statistics
 - 4 more proposals were disqualified due to other issues
 - These were already reviewed by the Director. Appropriate feedback has been prepared.
- **253 Recommended Proposals**
 - GO 1 in 9 for proposals and 1 in 8.8 for Hours
 - Small: 42.7% of time – 1 in 8
 - Medium: 34.8% of time – 1 in 9.6
 - Large: 22.5% of time - 1 in 9.2
 - Survey 3 for 4 targets recommended 1 in 11.7 for proposals and 1 in 56.5 for targets
 - Archival Research 37/135 = 1 in 3.65
 - Regular 22 recommended
 - Theory 12 recommended
 - Legacy 3 recommended
- Instruments: MIRI 24.8%, NIRCcam 20.3%, NIRISS 5%, NIRSPEC 49.9%
 - Imaging 23% vs Spectroscopy 77%
- Student led PIs 11.8% for 30 props (Cycle 2 10.4% for 26 props, Cycle 1 8.7% for 25 props)
- 47% of PIs are 1st time HST or JWST PIs (112 of 240 unique)



Acceptance Fraction by Size





Estimated Gender Stats

- Fraction of submitted proposals with female PIs consistent with previous cycle 31.8%
 - JWST Cycle 2 – 32.4%; HST Cycle 31 – 30%
- Higher fraction of female-PI accepted proposals 34 % (86/253)
 - JWST Cycle 2 - 29.5% (74/251)
 - JWST Cycle 1 - 30.1% (86/286)
 - HST Cycle 31 - 33% (53/159)
- Triaged Proposals
 - 148/609 for female PIs, 24.3%
 - 338/1304 for male PIs, 25.9%

	JWST Approved	Cycle 3 Reviewed	Success Rate	JWST Cy2 Approved	JWST Cy2 Submitted	Success Rate
Proposals	253	1913	13.2 %	251	1593	15.8%
Female PIs	86	609	14.1 %	74	516	14.3%
Male PIs	167	1304	12.8 %	177	1077	16.4%



Resource Recommendations

- **253 Recommended proposals:**
 - 208 GO Prime
 - 3 GO/Calibration
 - 37 Archival Research (12 Theory/25 Regular)
 - 3 Surveys for 639 Targets
 - 2 PPARs for 1000 Hours
- **Planned ~5400 hours for GO (Larges + Mediums + Smalls)**
 - 2000 for Small Proposals (≤ 25 hours)
 - 2050 for Medium Proposals ($> 25 - \leq 75$ hours)
 - 1300 for Large Proposals (> 75 hours)
- **5637.4 Recommended for approval from Panels (29.74 Calibration Hours)**
 - 120.95 Duplication Reductions
 - 29.74 Calibration Reduction
- **5486.8 Hours is the GO Recommendation**



Cycle 4 Calls for Proposals



JWST Timeline

STScI releases the annual JWST General Observer (GO)/Archival (AR) Call for Proposals in August to support the annual proposal deadline in October.

Telescope Allocation Committee (TAC) + Preparation



2022

2023

2024

7/1/2024
Cycle 3 starts

8/1/2024
GO Cy4 Call
for Proposals

10/16/2024
Deadline
GO Cy4
Deadline

Feb 2025
GO Cy4 TAC

7/1/2025
Cycle 4
starts



Expected Cycle 4 Resources

- General Observer programs – ~5,500 hours available in total
 - Small programs, up to 25 hours, ~2,900 hours
 - Medium programs, $25 < t < 75$ hours, ~1,250 hours
 - Large programs, > 75 hours, ~850 hours
 - **Exact number of hours allocated per category will depend on proposal pressure**
- Survey programs – ~1,000 targets available across all panels
 - Self-contained observations of targets drawn from a large sample
 - No guaranteed completion fraction
 - Visits should be less than ~100 minutes and minimal constraints
 - Shorter-duration, lower data-volume and spatially well-distributed Survey targets have more scheduling opportunities and a higher chance of execution
- Pure Parallel Programs
 - Attached to suitable Cycle 4 prime observations
- Archival programs
 - Proposal for analysis datasets that are publicly available at the start of Cycle 4
- JWST Joint Programs: Chandra, XMM, HST, NASA Keck, NOIRLab, NRAO, ALMA



Cycle 4 Science Timeline

Date	Milestone
August 1, 2024	GO/AR Cycle 4 Call for Proposals Issued
October 16, 2024	GO/AR Cycle 4 Proposal Deadline
November 6, 2024	STScI Releases proposals to panelists for review and preliminary grading
January 10, 2025*	Deadline for panelists to submit preliminary grades for proposals that they are assigned
February 3 – 7, 2025	Telescope Allocation Committee: Discussion Panels (Virtual)
February 10 – 12, 2025	Telescope Allocation Committee: Executive Committee Meeting (In-person)
February 26, 2025	Director's Review
February 27 – June 30, 2025	Program Implementation of accepted proposals
~1 st Week of March 2025	PI notification letters are distributed
July 1, 2025	Beginning of Cycle 4 Observations

*Includes more time for reviewers after proposal triage

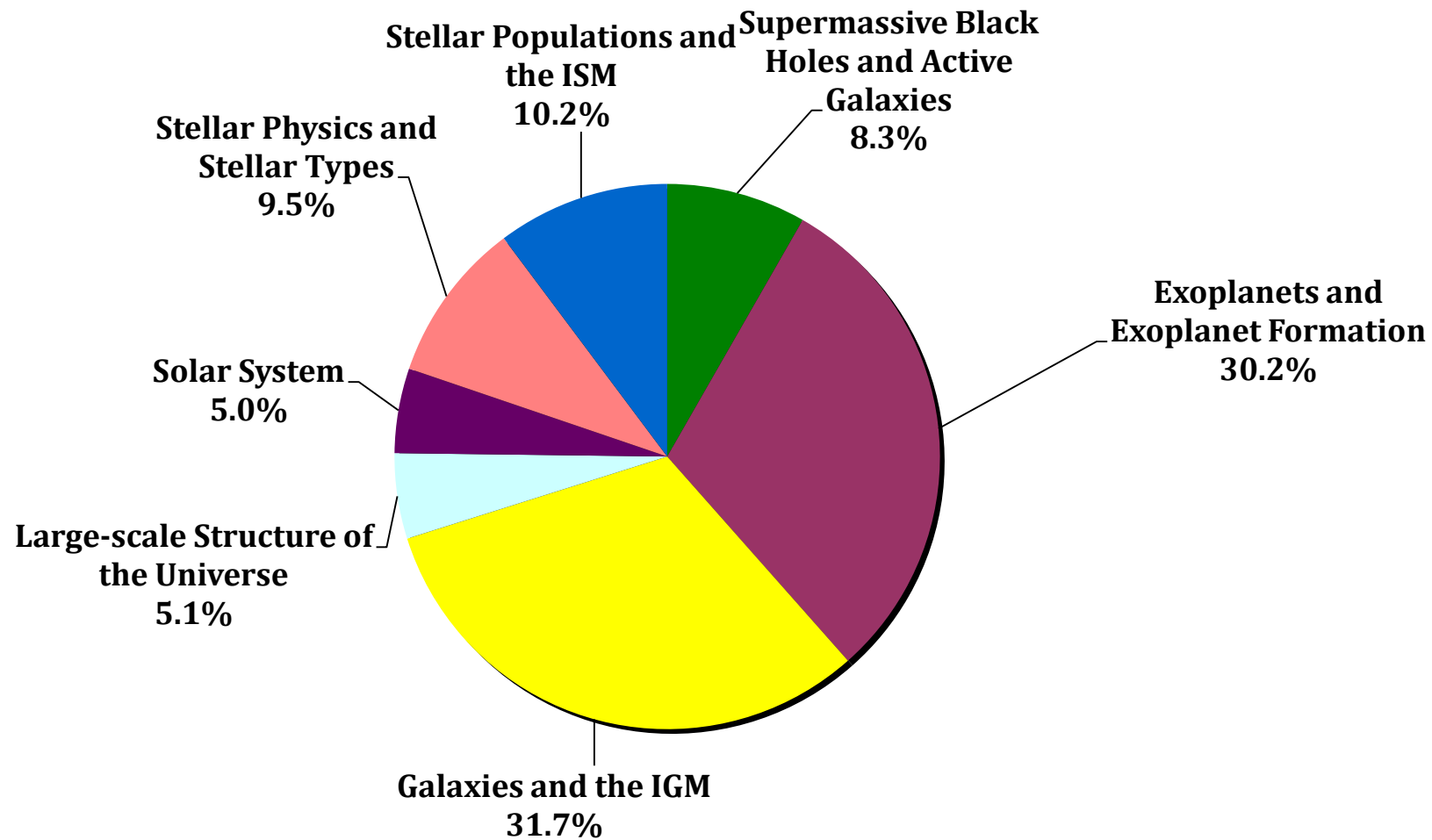


Joint Proposals

- Joint Proposals can be disqualified if any of the observations are deemed infeasible by either the Main Observatory or a Partner Observatory
- STScI as the Main Observatory
 - New Cycle 3 Opportunity: JWST-NRAO
 - Due at JWST Deadline:
 - JWST Observations: APT and PDF descriptions
 - Partner Observations: **APT partner resources requested**, PDF descriptions of partner observations
 - Due at Partner Observatory Deadline:
 - Ancillary information used to perform Technical Feasibility check
- STScI as the Partner Observatory (New for Cycle 3)
 - Due one month after Main Observatory Deadline:
 - APT specification of JWST observations
 - Accepted ALMA- JWST and Chandra-JWST programs did not have enough information for STScI to perform Technical Feasibility checks
- STScI will begin requesting HST APT files for JWST-HST Joint Proposals.



Science Categories





Science Categories

- Stellar Physics, Stellar Populations, and Large Scale Structure each have a broad range of science topics. Finding panelists that feel comfortable reviewing such a wide range of science is challenging.
- Large Scale Structure did not receive a large number of proposals
- Proposers like to submit to two Science Categories: (1) Exoplanets and Exoplanet Formation and (2) Galaxies and the Intergalactic Medium. Together, they comprise ~60% of JWST Cycle 3 proposals.
- STScI should adjust the Science Categories used to organize reviews so that the Science Keyword match for each proposal is higher.



Update Science Categories and Keywords

- **Science Categories and Keywords (<https://jwst-docs.stsci.edu/jppom/jwst-proposal-level-information/jwst-science-keywords>) are used to match proposals with reviewers**
- Science Keywords are chosen to be consistent with the Unified Astronomy Thesaurus (UAT, <https://astrothesaurus.org/>)
- JWST keywords were originally inherited from HST
- In Cycle 4, we would like to update the JWST Science Categories and Keywords to better reflect JWST Science
 - ***Reconfigure Stellar Physics/Stellar Pops into Stars/Dust and Gas***
 - ***Split Exoplanets and Exoplanet Formation into Exoplanet Atmospheres and Planet Formation***
 - ***Reconfigure Extragalactic Astronomy (Galaxies and the IGM, SMBH, and Large Scale Structure) into Science Categories based on distance (Nearby Galaxies, Peak of Star Formation, Distant Universe)***
- APT developers need requirements soon in order to be able to make the changes necessary for Cycle 4



Medium/Large Size Boundary

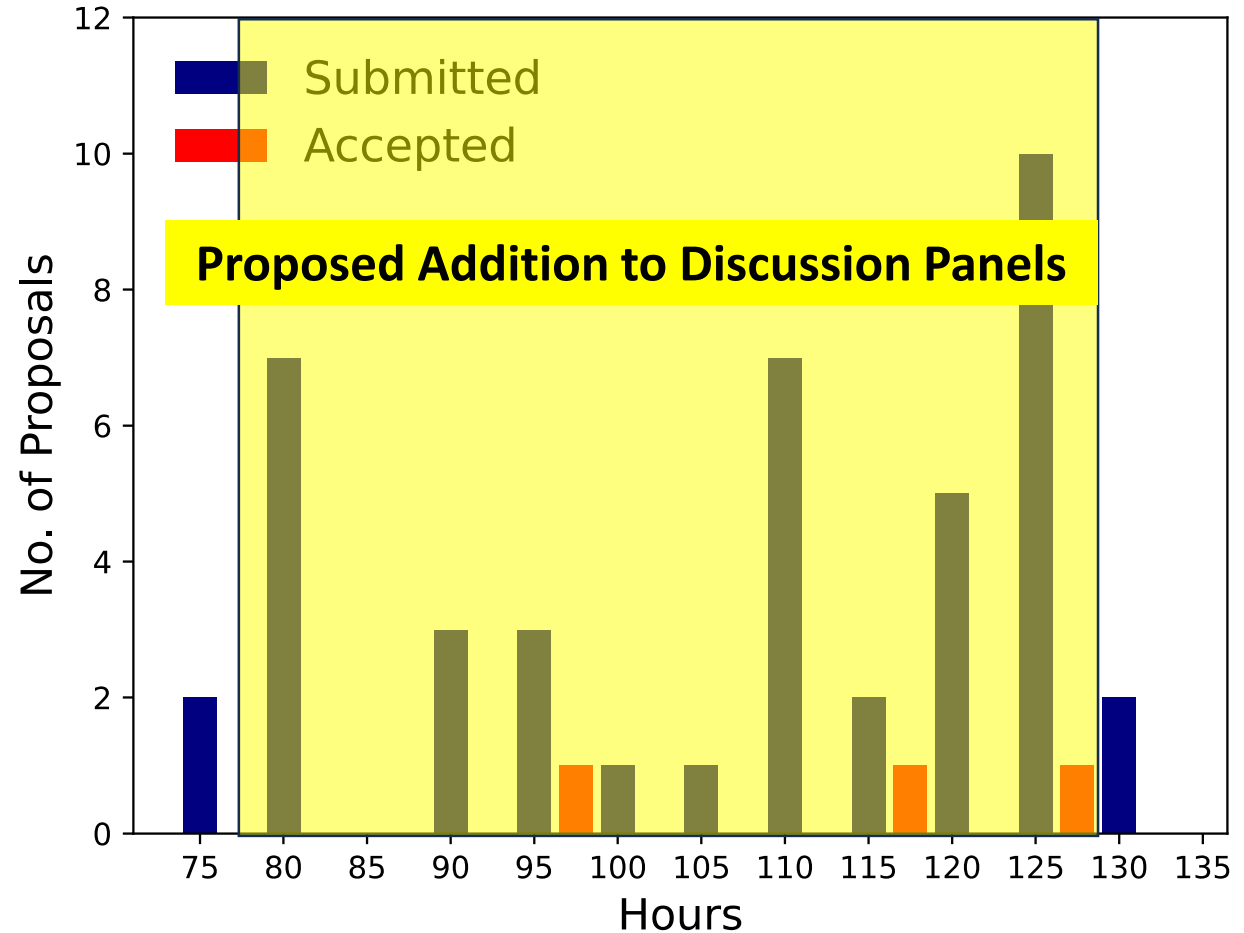
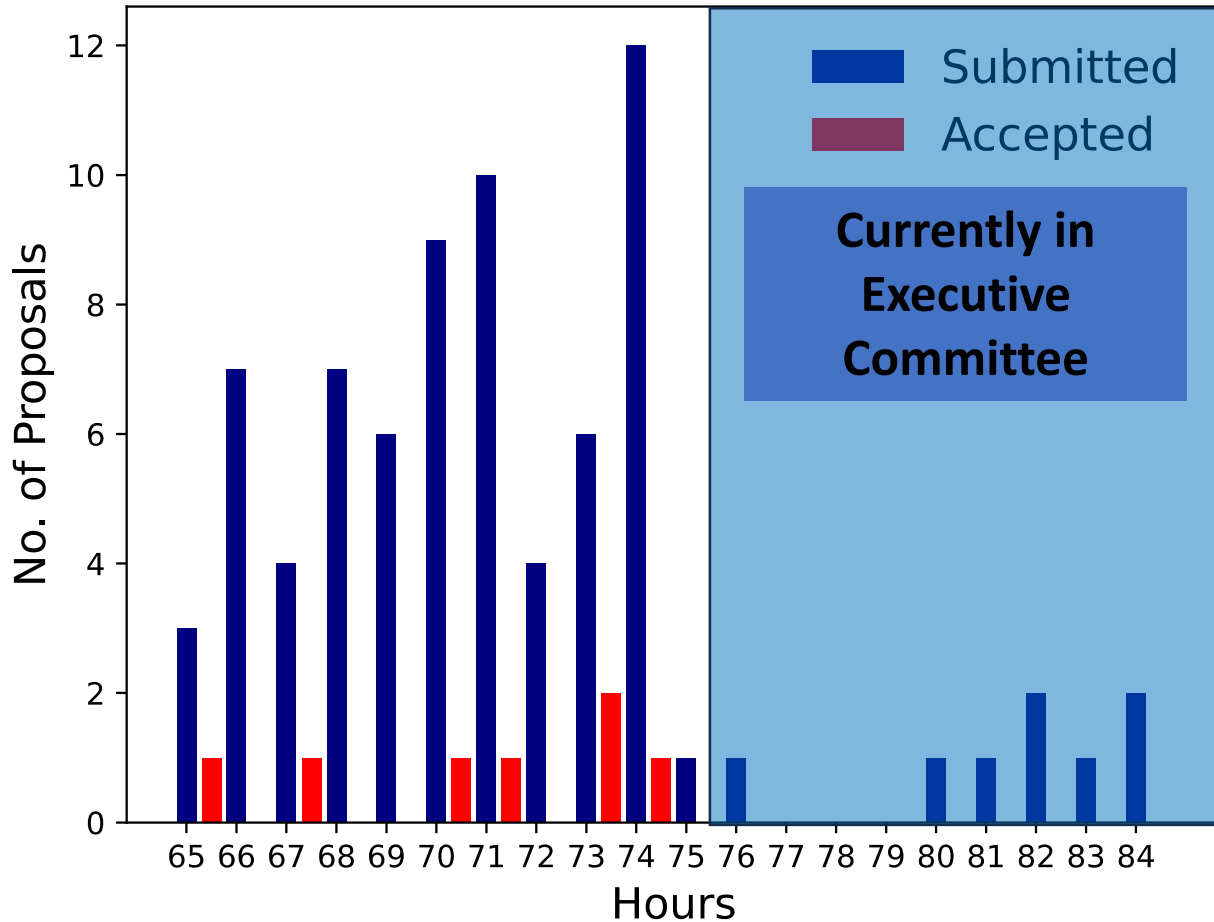
- Balancing the workload among the External Panels, Discussion Panels, and the Executive Committee
- **Raise the hour boundary between Medium and Large proposals?**

Projections Based on Cycle 3 Proposal Demographics

Request (hours)	# Proposals	# Treasury	Science Categories	Total EC Proposals
>75 - 80	1	0	1 Exo	103
>80 - 90	7	2	1 SS; 1 Exo; 1 St Ph; 2 Gal	98
>90 - 100	6	1	1 SS; 2 Exo; 1 St Ph; 1 Gal	93
>100 - 110	3	1	2 Gal	91
>110 - 120	7	0	4 Exo; 1 Gal; 1 SMBH; 1 LSS	84
>120 - 130	16	6	6 Exo; 1 St Ph; 3 Ga	74
TOTAL	40	10	2 SS; 14 Exo; 3 St Ph; 9 Gal; 1 SMBH; 1 LSS	



Sizes of Large Proposals





Very Small/Small Size Boundary

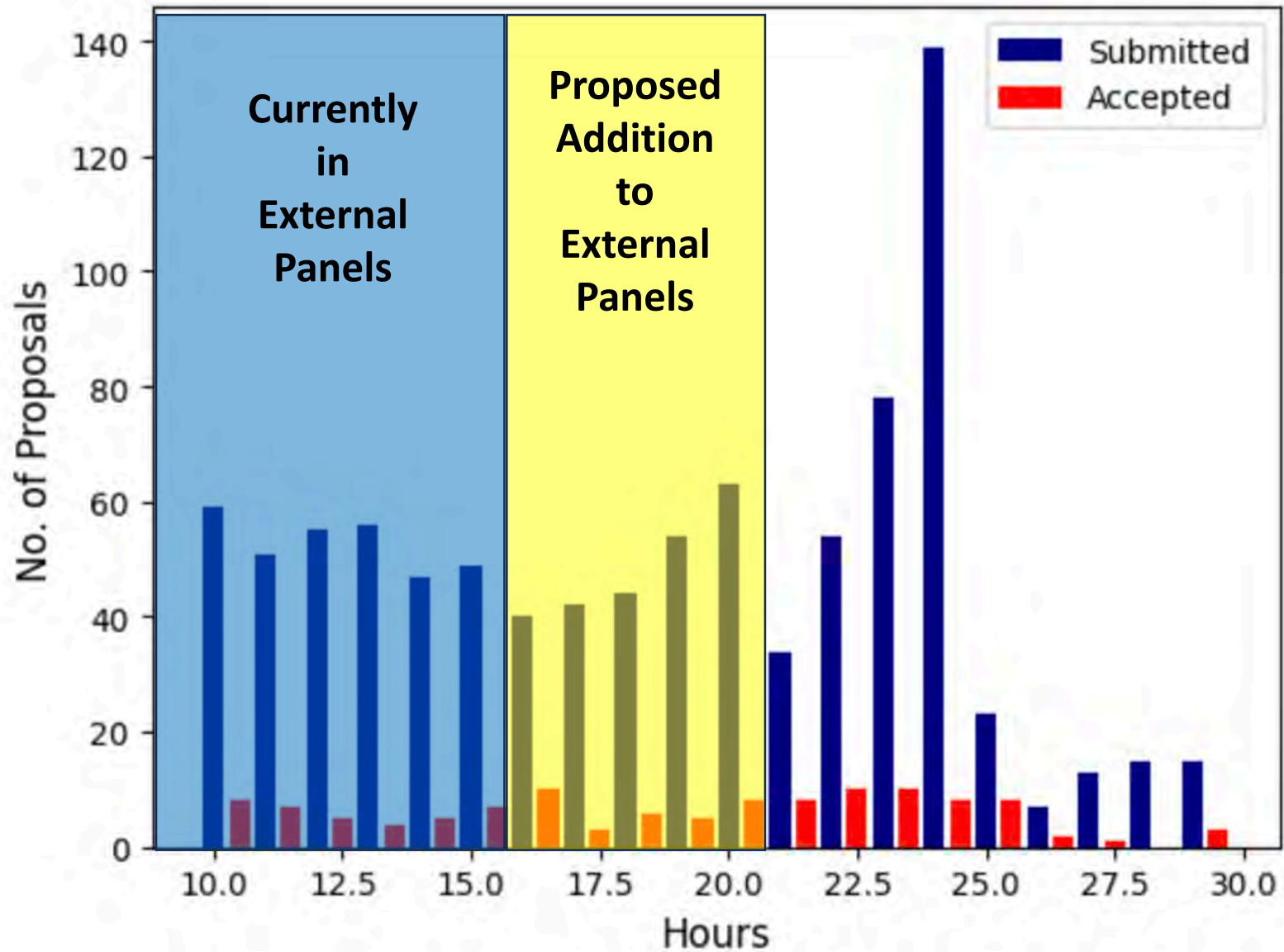
- Balancing the workload among the External Panels, Discussion Panels, and the Executive Committee
- **Raise the hour boundary between Very Small and Small Proposals to send more proposals to External panels**

Projections Based on Cycle 3 Proposal Demographics

Request (hours)	# Proposals	# Medium	Assumed EC	Total External Proposals	Total Discussion Panel Props
Cycle 3	752		104	752	1055
≤ 15	752		74	752	1085
15 < x ≤ 20	133	7	74	878	959
20 < x ≤ 25	383	0	74	1261	576



Sizes of Small Proposals





Re-cycling accepted proposals

- Some successful Cycle 2 proposals (especially Survey and ToO proposals) were resubmitted in response to the Cycle 3 Call for Proposals with the exact same title and abstract.
- Some EC proposals were submitted with titles and abstracts that used sentences and phrases lifted from white papers posted on Astro-ph.
- These proposals are problematic because either
 - The authors have plagiarized someone else's work or
 - The authors have revealed their identity
- **Proposals recycling substantial excerpts from publicly available material (e.g. title and abstract of previously accepted proposals or text from publicly available white papers) will be disqualified as Dual Anonymous Peer Review (DAPR) violations**



Page Limits

- The JWST TAC is experiencing fatigue from reading long proposals in which the science justification is repeated multiple times in different places
- The JWST proposal page limits and the HST proposal page limits are different
- **At least adjust the JWST proposal page limits so that they are the same as HST's**

Proposal Category	JWST Cycle 3	HST Cycle 32	Proposed JWST Cycle 4
Small GO	8	8	8
Medium GO	10	9	9
Large GO	12	11	11
Treasury GO	12	11	11
Calibration GO/AR	8	8	8
Survey/Snapshot	8	8	8
Regular AR	9	8	8
Theory AR	9	8	8
Legacy AR	12	11	11



Target of Opportunity (ToO) Observations

- Some ToO science cases are very rare and have a low probability of executing within a Cycle. These programs are eligible for carry-over status in Cycle N+1.
- These programs may require a substantial fraction of a panel's telescope time allocation. Thus, if they are not executed, a Science Category may "lose" their allocation of telescope time.
- There may be several proposals to address each science case

Possible Strategies to Address Issues:

- Prorate the time by the probability a standard factor (0.3?) for low probability events. Chandra X-ray Observatory uses this policy for their ToOs.
- Solicit community programs (outside of the regular GO CfP) to address unique events such as interstellar comets, kilonova



Cycle 4 TAC Preparations



Duplication policy

Definition:

- Duplications are observations of the same target or field using the same instrument, same mode, same optical elements and with an exposure time within a factor of four
- **Primary goal is to maximize telescope efficiency by eliminating unnecessary observations**
- In general, duplications are only allowed if there is a clear scientific justification
 - Exceptions include partial duplications, impacting a subset of the observing program and where removing the observation from one or other program could harm the science, e.g.
 - Field of view overlap by $< 50\%$
 - Observations of a target using multiple filters where most are unique (esp. NIRCam)
 - NIRSPEC MOS observations where $< 30\%$ are source duplications
- If there are no mitigating circumstances, one observation/visit/target will be disallowed
 - Previous cycle observations have priority
 - In-cycle duplications are adjudicated on a case by case basis, with the prime aim to minimize the overall science impact
 - Factors include data access and depth/integration times
- We do not ask teams to share data



Duplication identification

- Principal Investigators are required to identify and justify any duplications with previous cycle programs
 - Science case should be included in the proposal
 - If not, the observations are disallowed
- In-cycle duplications are more complicated to deal with
 - Ideally, they are identified by and resolved by the TAC
 - In practice, there are always a few that are missed
 - Additional duplications may be identified by the science policies group
 - Community members also have the option to flag potential duplications via a duplication report to the Telescope Time Review Board (TTRB)
- Final decision on duplications rests with the STScI Director, the Allocating Official for JWST



JWST Cycle 3 Duplication flagging and adjudication

- **Before the Panels Meet**
 - The week before the meeting, the JWST SPG will distribute (1) a *.pdf document with the titles and abstracts and (2) a *.xlsx spreadsheet with the coordinates and observing details for the Very Small proposals that are likely to be accepted
- **During the Discussion Panel Meetings**
 - Chair Breakfasts will provide a forum for EC members chairing mirror panels to compare the highly ranked Small and Medium proposals from their panels.
- **The Executive Committee Meeting**
 - Chairs will summarize highly ranked Medium proposals, detailing the high-level science questions that will be addressed
 - Once the discussion panel ranked lists are finalized, the JWST SPG will distribute (1) a *.pdf document with the titles and abstracts and (2) a *.xlsx spreadsheet with the coordinates and observing details for the Small and Medium proposals that are likely to be accepted
- **After the TAC has disbanded**
 - STScI will run duplication checking software to search for additional duplications. The JWST SPG may reach out for assistance adjudicating late breaking duplications.



JWST Cycle 4 Duplication Strategy

- JWST Cycle 3 duplication flagging and adjudication was effective
 - TAC identified the majority of duplications which were subsequently adjudicated by the TAC Panel Chairs
 - A handful of additional duplications were identified by the software after the EC meeting and adjudicated by Panel Chairs over e-mail
 - One additional straggler identified after notification letters. Two exoplanet proposals were approved for one transit opportunity.
- For Cycle 4
 - Duplication checking software will be run earlier, before the TAC meets, instead after the end of the EC meeting
 - Panel Chairs will no longer need to search for duplications and should instead be able to rely on the software identifications



TAC Logistics

- Discussion Panelist Attendance
 - Several panelists had many time commitments during the week of the discussion panels. Some were absent for more than 25% of the discussion period.
 - Update invitation letters to specify that discussion panelists should have no more than 3 hours of time conflicts (neglecting breaks and discussion of proposals for which they are conflicted)
- Schedule
 - Galactic panels met M-Th; Extragalactic panels met Tu-Fri. Extragalactic panelists struggled with the lack of an extra day of break between the Discussion and EC meeting
 - Shift the first day of the EC meeting from Monday to Tuesday.



Volunteer to Serve on the TAC!

STScI Outerspace Site Home

SMO Brochure Online Information

Pages / SMO General Information

JWST Review Volunteer Form

Created by John Debes, last modified by Kimberly Oylar on Aug 08, 2022

STScI solicits proposals for JWST Observing, Archival, and Theoretical Research and relies on volunteers to conduct dual anonymous peer review of the proposals. STScI seeks to broaden its volunteer support from astronomical researchers who are at least two years past PhD completion. Researchers from underrepresented groups are particularly encouraged to volunteer. We seek to have volunteers to review proposals primarily for scientific merit, impact, and the unique use or support of JWST's capabilities. There is currently one way to participate:

- **Main Review – Panel** : Reading and grading of proposals in your own time over a period of ~1 month followed by a 3-day virtual discussion meeting, brief comments provided after. You will be assigned to a panel aligned with your area of expertise that is headed by a chair and vice-chair.

Contact Information

Name*

Institution*

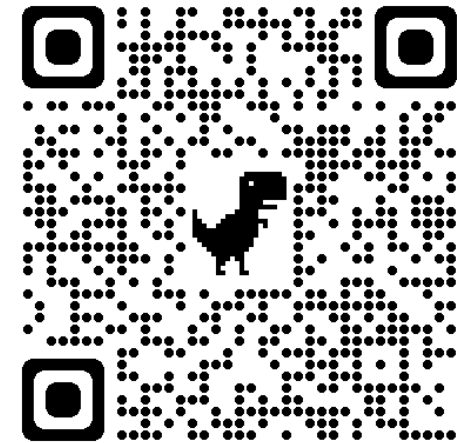
Email*

Year of PhD*

We seek people who do research in a broad range of astronomy topics, but currently arrange our reviews over the following science areas. Please select the category you wish to serve on. More than one answer is allowed.

- **SOLAR SYSTEM ASTRONOMY**: This includes all objects belonging to the solar system (except the Sun, Mercury, and Venus), such as planets, minor planets, comets, asteroids, planetary satellites, and Kuiper-belt objects.
- **EXOPLANETS AND EXOPLANET FORMATION**: This includes all objects belonging to known extrasolar planetary systems, and observations of their host stars, as well as all studies of circumstellar and proto-planetary disks.
- **STELLAR PHYSICS AND STELLAR TYPES**: This includes stars of all temperatures and evolutionary phases, including pre-main sequence stars, supernovae, pulsars, X-ray binaries, CVs, and planetary nebulae. It also applies to ISM and circumstellar matter in the Milky Way.
- **STELLAR POPULATIONS AND THE INTERSTELLAR MEDIUM**: This includes resolved stellar populations in globular clusters, open clusters or associations, and the general field of the Milky Way and other nearby galaxies. Studies of color-magnitude diagrams, luminosity functions, initial-mass functions, internal dynamics and proper motions are in this category.
- **GALAXIES AND THE INTERGALACTIC MEDIUM**: This includes studies of the initial mass function, stellar content and globular clusters in distant galaxies, galaxy morphology and the Hubble sequence, and low surface-brightness galaxies. Starbursts, IR-bright galaxies, dwarf galaxies, galaxy mergers and interactions may fall under this heading. This category also includes studies of gas distribution and dynamics in distant galaxies and their surroundings. Starbursts, IR-bright galaxies, dwarf galaxies, galaxy mergers, and interactions may also fall under this heading if the emphasis is on the ISM.

Evaluating the proposals submitted is an enormous endeavor requiring hundreds of experts from the astronomical community. *Consider volunteering to serve!*





Summary

- **Cycle 4 Calls for Proposals**
 - Offers similar resources compared with Cycle 3
 - Has a proposal deadline of October 16, 2023. The JWST Proposal Deadline is expected to be in October for subsequent cycles.
- **Cycle 4 Telescope Allocation Committee**
 - Planning to accommodate 2000 proposals
 - Will have the same structure as Cycle 3

Volunteer!

- *To work with JWST SPG to re-examine Science Categories and Keywords*
- *To serve on the TAC*



Backup Slides



Selection Criteria

Impact within the sub-field: The scientific merit of the program and its contribution to advancement of knowledge.

- The immediate sub-field of the proposal is the niche area of the program, not the whole broad science area of the topical panel to which it was assigned.

Out-of-field impact: The program's impact for astronomy in general. Are there implications for other science areas and/or insights into larger-scale questions?

- The proposal does not have to impact all of astronomy, but should ideally impact a number of other sub-fields or provide significant impacts in at least one other sub-field.

Suitability: The necessity for JWST observations or relevance to JWST science:

- Observing and regular archival programs: a demonstration that the unique capabilities of JWST are required to achieve the science goals; how much of a scientific advantage does JWST data offer over other facilities?
- Theory programs: a demonstration of broad applicability to JWST observational programs.



Cycle 4 Selection Criteria

- Challenges
 - Panelists were not sure what constituted out-of-field impact
 - Panelists were not sure how to grade suitability
 - Panelists wanted to use their own weighting of the scoring criteria
- Update
 - Provide more education and outreach on selection criteria
 - Update proposal template to include references to selection criteria
 - Change relative weight of selection criteria
 - Do not normalize suitability grades
- Or revise?
 - Some panelists have expressed a preference for submitting only one grades so that they can use their own relative weights of the selection criteria