



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

Cycle 3 Preparation

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on behalf of the STScI Science Policies Group

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JWST Timeline

Beginning in Cycle 3, STScI plans to release the annual JWST General Observer (GO)/Archival (AR) Call for Proposals in mid-August and to support the annual proposal deadline in late October.

Telescope Allocation Committee (TAC) + Preparation



2022

2023

2024

7/1/2023
Cycle 2 starts

- D-2 months
- GTO Cy3 Targets Released
 - GO Cy3 Call for Proposals

10/25/2023
Deadline
GO Cy3
Deadline

Jan – Feb 2024
GO Cy3 TAC

7/1/2024
Cycle 3 starts

Cycle 3 is last cycle in which Guaranteed Time Observers (GTOs) can submit GTO programs



Expected Cycle 3 Resources

- General Observer programs – ~5,000 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 3 prime observations
- Archival programs
 - Proposal for analysis datasets that are publicly available at the start of Cycle 3
- JWST Joint Programs: Chandra, XMM, HST, NASA Keck, NOIRLab, ALMA
 - **New NRAO/JWST Joint Opportunity available in Cycle 3**



Cycle 3 Science Timeline

Date	Milestone
August 15, 2023	GO/AR Cycle 3 Call for Proposals Issued
October 25, 2023	GO/AR Cycle 3 Proposal Deadline
November 9, 2023	STScI Releases proposals to panelists for review and preliminary grading
January 17, 2024	Deadline for panelists to submit preliminary grades for proposals that they are assigned
January 29 – February 2, 2024	Telescope Allocation Committee: Discussion Panels
February 5 – 7, 2024	Telescope Allocation Committee: Executive Committee Meeting
February 22, 2024	Director's Review
February 23 – June 30, 2024	Program Implementation of accepted proposals
February 28, 2024	PI notification letters are distributed
July 1, 2024	Beginning of Cycle 3 Observations



Calls for Proposals



APT Coversheets

Proposal ID

Category Calibration Treasury GO-Archival

Pure Parallel Proposal

Cycle

←

←

Science Time (hours)

Charged Time (hours)

Data Volume (MB)

←

←

Proposal Size

Exclusive Access Period

Allow Restricted (this session only)

Scientific Category

Alternate Category (Optional)

Science Keywords

Choose 2 to 5 science keywords.

←

Observers must mark their APT coversheets if they would like to request

- Unschedulable Observations
- Pointing in the Micrometeoroid Avoidance Zone
- Custom time allocation
- Time in Cycles 4 or 5
- Joint Program Observations (e.g. ALMA, Chandra, HST, NASA Keck, NOIRLab, NRAO, XMM-Newton)

Proposal requests will not be considered unless they are marked on the APT coversheet



Updated Science Keywords

- Science 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 3, the science keywords were updated slightly
 - Some categories had a number of science keywords added to better reflect JWST science
 - ***New Stellar Populations and the ISM Science Keywords:*** Astrochemistry, Interstellar Atomic Gas, High Mass Star Formation, Initial Mass Function, Low Mass Star Formation, Low Metallicity Stars, Molecular Clouds, Molecular Gas, Polycyclic Aromatic Hydrocarbons, Stellar Population Synthesis, Young Stellar Objects
 - Some science keywords were added to multiple Science Categories to reflect changes in how data are analyzed.
 - ***High Contrast Imaging*** added to Exoplanets and Exoplanet Formation, Stellar Physics and Stellar Types and Supermassive Black Holes



Future Cycle Requests

Proposals may request long term status, telescope time not only in Cycle N (Current Cycle) but also N+1 (Next Cycle) and N+2 (Third Cycle)

APT Instructions

- **Filled out instrument template(s) should only reflect telescope time requested in the current cycle**
- Future cycle time requests should be entered in “Future Cycles” menu with estimated time request in Hours or % of Cycle
- Future cycle coordinated parallel usage should also be indicated if requested using check boxes
- Long term programs may contain non-disruptive Targets of Opportunity (ToOs)



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.



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



In-cycle duplication identification

- Duplication flagging by the TAC
 - In-panel duplications are easy to identify, but conflicts can lead to similar proposals being distributed to different panels
 - Panel chairs are encouraged to share their list of highest-ranked proposals to check for science balance, identify duplications and recommend mitigations
 - External panels have no chair, so those lists need to be shared by SPG
- Director's Review
 - The science program presentation includes TAC recommendations for duplications, together with any additional cases that are identified
 - Director supplies the final ruling on those cases
- Post-notification
 - All proposals go through automated duplication checking, which can reveal additional duplications
 - Community members may submit duplication reports to the TTRB
 - Science policies reviews those reported duplications and makes a recommendation to the Director
 - The Director provides the final ruling on these cases



JWST Cycle 2 duplications

- Cycle 2 was challenging for a number of reasons
 - Numbers – Largest number of proposal submissions resulting in high workload for panels and support staff
 - Low-hanging fruit – There’s a lot of “obvious” science in the second year of a major observatory, therefore more potential for similar proposals on the same targets
 - Time – the compressed schedule (+ high workload) led to oversights & mistakes e.g. failure to circulate information on external panel recommendations, inability to complete full target checks post-Director’s Review
 - Technical issues with the automated duplication checks – notably MRS observations
- Outcomes
 - Six duplications (individual targets) resolved at Director’s Review
 - Multiple potential duplications identified post-notification
 - Overwhelming majority are benign with no action required
 - Two cases involved full-program duplications & small programs were terminated
 - One case involved multiple targets in common (medium vs. large)
 - Four cases of duplication of individual targets between programs



Mitigations for Cycle 3

- For the TAC
 - Ensure that the abstracts for recommended proposals from the external panels are circulated to the relevant discussion panels (done for HST 31)
 - Ensure that there is adequate time at the Executive Committee to discuss possible duplications (done for HST 31)
- Automated checks
 - Unlike HST Phase I proposals, JWST proposals have sufficient information to allow automated duplication checking at submission
 - However, the automated program casts a wide net and identifies many false positives that require manual verification
 - It's not logistically feasible to cross-reference 1600 proposals
 - However, it is feasible to cross-reference the recommended proposals (~300)
 - Loaded into a stand-alone database & checked prior to Director's Review
- Less compressed timeline
 - The longer time between the TAC (end January) and the start of the Cycle (7/1) will allow a more thorough review of proposals and target lists



TAC Preparations



Time Allocation Committee (TAC) Organization

- **Meeting Chair:** Emily Levesque

Same structure as in previous years

- **Executive Committee:** Composed of Discussion Panel Chairs and At-Large Members who serve as reviewers for the Large (>75 hours), Treasury, and AR Legacy proposals.
- **Discussion Panels:** Panelists rank Small (> 15 and \leq 25 hour), Medium (> 25 and \leq 75 hour), AR and Survey proposals and provide reviews on a subset of Large proposals. Each panel has an hour allocation.
- **External Panels:** Panelists provide asynchronous reviews of the smallest proposals (\leq 15 hours). Since only a handful of \leq 15 hour LSS proposals were submitted in Cycle 2, LSS will not have an External Panel.
- **Expert Reviewers:** Reviewers provide asynchronous reviews of EC proposals and proposals with a large number of discussion panelists conflicts.



Proposal Review Assignments

- STScI is planning TAC assuming a record 1800 proposals submitted in Cycle 3!
- Exact number of hours allocated to Small, Medium, and Large categories will be adjusted to reflect proposal submissions
- Workload
 - Proposals reviewed by External Panels will be assigned 5 Graders
 - Proposals reviewed by Discussion panels will assigned 6 preliminary reviewers (1 Primary reviewer, 1 Secondary reviewer, and 4 Graders)
 - Proposals reviewed by the EC will be assign 6 preliminary reviewers (1 Primary reviewer, 1 Secondary reviewer, and 6 Graders) and 5 Expert Reviews

Projected Number of Discussion Panelists Needed Based on Cycle 2 Demographics (w/External Reviews)

Total Proposals	Solar System	Exoplanets	Stellar Physics	Stellar Pops	Galaxies	SMBH	LSS	Total Panels
1600	1 (35)	4 (48)	2 (39)	2 (36)	4 (48)	2 (34)	1 (45)	16
1800	1 (39)	4 (50)	2 (44)	2 (40)	4 (50)	2 (38)	1 (46)	16
2000	1 (43)	4 (50)	2 (48)	2 (45)	4 (50)	2 (43)	1 (51)	16

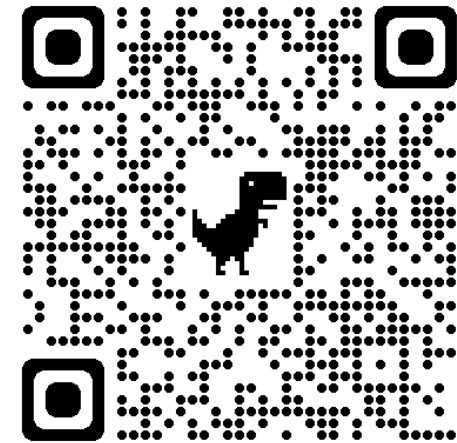


Volunteer to Serve on the TAC!

The screenshot shows the STScI website with the following elements:

- Header: STScI Outerspace, Site Home, Search bar.
- Navigation: SMO Brochure Online Information.
- Left sidebar: SMO General Information, HST Review Volunteer..., JWST Review Volunteer..., and a note: "The content of this macro can only be viewed by users who have logged in."
- Main content: "Pages / SMO General Information", "JWST Review Volunteer Form", "Created by John Debes, last modified by Kimberly Oylar on Aug 08, 2022".
- Text: "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:"
- List-Group: "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."
- Form: "Contact Information" with fields for Name*, Institution*, Email*, and Year of PhD*.
- Text: "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."
- List-Group: "SOLAR SYSTEM ASTRONOMY", "EXOPLANETS AND EXOPLANET FORMATION", "STELLAR PHYSICS AND STELLAR TYPES", "STELLAR POPULATIONS AND THE INTERSTELLAR MEDIUM", "GALAXIES AND THE INTERGALACTIC MEDIUM".

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



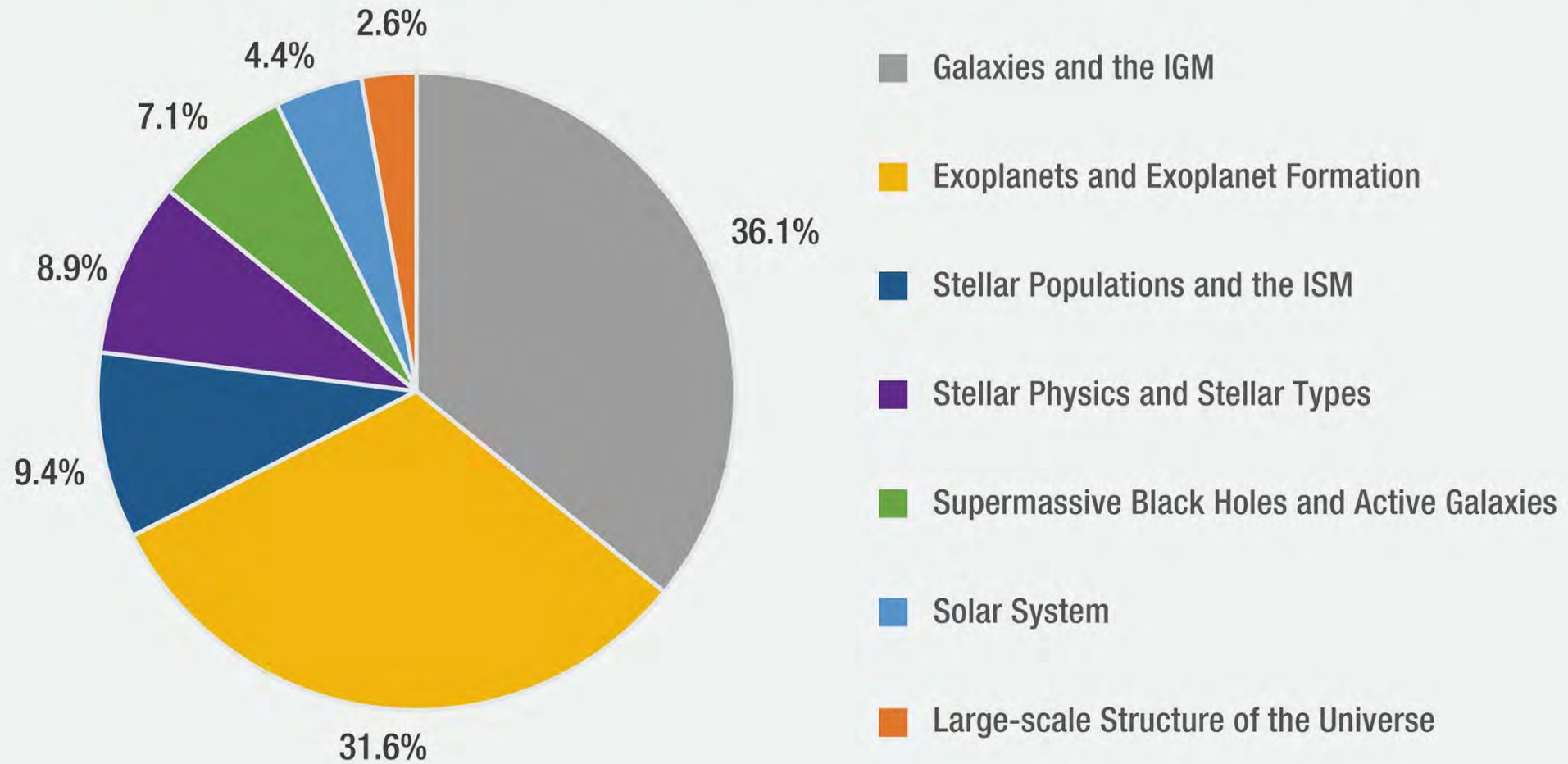


Future Work



Science Categories

Figure 2: The fraction of time allocated by science category





Science Categories

- Approximately 65% of JWST Cycle 2 proposals were submitted to two Science Categories: (1) Exoplanets and Exoplanet Formation and (2) Galaxies and the Intergalactic Medium
- Scientifically broad categories such as Stellar Physics and Stellar Populations receive a smaller fraction of proposals.
- Should STScI adjust the Science Categories used to organize reviews so that the Science Keyword match is potentially higher.
- *For example, should dust in different contexts (circumstellar, Interstellar) be grouped together within a Science Category instead of divided among Stellar Physics and Stellar Populations and the ISM.*
- **JWST SPG invites a member of the JSTUC to work together to review the proposal Science Categories.**



Science Keywords

- Continue to revise Science Keywords to make sure that they accurately capture JWST science.



Summary

- **Cycle 3 Calls for Proposals**
 - Offers similar resources compared with Cycle 2
 - Has proposal deadline of October 25, 2023. The JWST Proposal Deadline is expected to be in October for subsequent cycles.
- **Cycle 3 Telescope Allocation Committee**
 - Planning to accommodate 1800 proposals
 - Will have the same structure as Cycle 2

Volunteer!

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