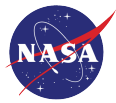




**STScI** | SPACE TELESCOPE  
SCIENCE INSTITUTE

**James Webb Space Telescope  
Cycle 1 Guaranteed Time Observations  
Call for Proposals  
6 January 2017**



[jwst.stsci.edu](http://jwst.stsci.edu)

[jwst-docs.stsci.edu](http://jwst-docs.stsci.edu)

[jwsthelp.stsci.edu](http://jwsthelp.stsci.edu)

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# Who's Responsible, and Where to Get Help

The Science Policies Group (SPG), part of the STScI Science Mission Office (SMO), is responsible for the JWST science program selection process. The SPG staff includes astronomers Claus Leitherer (Head of SPG), Neill Reid (Associate Director of Science), Andrew Fruchter, Janice Lee, Jennifer Lotz, Amaya Moro-Martin, Louis-Gregory Strolger, and Technical Manager Brett Blacker.

These documents were written and edited by Janice Lee, Jennifer Lotz, Amaya Moro-Martin, Neill Reid, and Louis-Gregory Strolger.

## Where To Get Help

The JWST User Documentation is available at [jwst-docs.stsci.edu](http://jwst-docs.stsci.edu).

Additional tools and resources may be found at [jwst.stsci.edu](http://jwst.stsci.edu).

Please submit a request to [jwsthelp.stsci.edu](mailto:jwsthelp.stsci.edu) for any questions.

# JWST Cycle 1 Guaranteed Time Observations Call for Proposals

James Webb Space Telescope (JWST) Guaranteed Time Observations (GTO) are awarded to scientists who deliver key JWST components. Initial JWST Cycle 1 GTO proposals and descriptions of observations are due on April 1, 2017. Finalized JWST Cycle 1 GTO observation descriptions and targets will be publicly released by June 15, 2017.

## Important Dates

<b>Stage 1</b>	Release of the Cycle 1 call for GTO proposals	January 6, 2017
	Cycle 1 GTO Science Descriptions and Observation Specifications due	April 1, 2017
	APT version 25.2 Released (with final Cycle 1 overhead calculations)	June 1, 2017
<b>Stage 2</b>	GTO Observation Specifications Published (public)	June 15, 2017
<b>Stage 3</b>	GTO APT Technical Reviews and Revisions	July 28–September 15, 2017
	Public release of GTO APT files	December 15, 2017

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## About This Document

Guaranteed Time Observations (GTO) reward both individuals and teams of scientists who were selected to deliver of key hardware and software components, or technical and inter-disciplinary knowledge for JWST. The program provides a total of about 16% use of the observatory over the first 3 cycles of operation. See the section [JWST Cycle 1 GTO Proposal Submission Policies](#) for information on who is eligible to submit, observing time requirements (including overheads), data rights, restrictions on types of observations, and other policy information.

Each JWST GTO is required to submit a description of the proposed Cycle 1 science program, including specific targets and specific observations using the templates provided. Those observations specifications will be reviewed and revised, and are required to be finalized at a date at least two months before the Cycle 1 GO Call is released, at which time the specifications will be made public. At the

same time, GTOs must develop detailed observing proposals, which are required to be submitted using the Astronomer's Proposal Tool. The Cycle 1 GTO proposal submission process, therefore, has three stages: (1) [preparation of the Science Descriptions and Observation Specifications templates](#), (2) finalizing reservations for publishing observing specifications, and finally (3) Astronomer's Proposal Tool (APT) submissions for technical review and revisions. The section [JWST Cycle 1 GTO Proposal Submission Process](#) describes this process in full.

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## GTO Stage 1 Proposal and Observation Description Templates

Teams should complete the [GTO Observation Specification Workbook \[xlsx\]](#) to provide descriptions of their observations for Cycle 1. The [Guide to the Observation Specification Worksheet \[docx\]](#) gives brief details on the fields in each worksheet of the workbook. A [GTO Proposal \[docx\]](#) should accompany the workbook, to provide general science summaries, coordinated parallel justifications (if applicable), and the breakdown of total hours to charge which programs. The proposal abstracts will be made public in the [stage 2](#) release of the observation specifications.

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## Related links

[JWST Director's Discretionary Early Release Science Call for Proposals](#)

[JWST Cycle 1 Proposal Opportunities](#)

[JWST General Science Policies](#)

[JWST Astronomers Proposal Tool Overview](#)

[JWST Observatory and Instrumentation](#)

[JWST Observation Planning](#)

# JWST Cycle 1 GTO Proposal Submission Policies

The requirements for JWST Cycle 1 Guaranteed Time Observations (GTO) proposals are described, including eligibility and observing restrictions

## Observing Time in Cycle 1

JWST observing programs are allocated against wallclock time, with 8776 hours available to schedule in an annual cycle. Up to 10% of the time is available for Director's Discretionary Time programs. In Cycle 1 the total time devoted to Guaranteed Time Observer and General Observer programs is estimated to be 7900 hours.

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## Who May Submit to the GTO

Any of the selected NASA, ESA, or CSA instrument teams (for NIRCams, NIRSpec, MIRI, and FGS/NIRISS), or selected scientists, or any member of these teams (with PI approval), may submit for the JWST GTO opportunity. Specifically these teams and individuals are: the NIRCams Team, the NIRSpec Team, the U.S. MIRI Science Lead, each of the eight U.S. MIRI Science Team members, The European MIRI Science Team, The FGS/NIRISS Team, The U.S. Telescope Scientist, and each of the six interdisciplinary scientists.

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## Proposal Confidentiality

Proposals submitted to STScI will be kept confidential to the extent allowed by the review process. For accepted proposals, the scientific justification section of the proposal remains confidential, but other sections become publicly accessible, including PI and Co-I names, project titles, abstracts, description of observations, special scheduling requirements, and details of all targets and exposures.

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## Data Rights

GTO investigators may have exclusive access to their science data during an exclusive access period, or proprietary period, that is nominally **12 months** following the date on which the data are archived. At the end of this proprietary period, the data become available for

analysis by any interested scientist through the [Mikulski Archive for Space Telescopes \(MAST\)](#). GTO proposers may request shorter proprietary periods, or may waive their proprietary rights altogether, if they so chose. Because of the potential benefit to the community at large, GTO proposers should give this possibility consideration.

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## Duplication Policies and Procedures

Some duplicate observations may be permitted if there is sufficient scientific justification to do so. The Telescope Allocation Committee must explicitly recommend for implementation any General Observer (GO) programs that duplicate GTO observations. Potential duplications among the GTO teams will be reviewed by the STScI Director, checked against priorities set in [Policy 9 of the NASA-SMD Policies](#). In all cases, the STScI Director will make the final approval. A more complete description of what constitutes a duplication with JWST instrumentation, and the procedures for checking and reviewing potential duplications, can be found on [JWST Duplicate Observations Policy](#).

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## Funding

Resources to U.S. GTO investigators are provided directly by NASA, in response to the JWST Phase E Funding Call. GTO investigators have already been notified of their awards, which will be phased over the FY17 through FY23 period.

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## Types of Observations and Restrictions:

Most observations of external targets are expected to be scheduled as primary observations, which are observations that determine the telescope pointing and orientation. There are, however, certain restrictions that apply to some types of targets.

## Coordinated Science Parallel Observations

There is the opportunity for some Coordinated Science Parallel Observations, in which simultaneous observations may be made with instruments other than the primary instrument. Coordinated Science Parallel observations should have science goals that support or complement the prime science programs. The permitted instrument combinations are also detailed below. Pure Science Parallel Observations, which utilize instruments other than the primary on observations from unrelated proposals, cannot be requested by GTO or ERS programs.

GTO investigators may request Coordinated Science Parallel observations if they are scientifically justified. In Cycle 1, coordinated parallels will be available with the following instrument combinations:

1. NIRCam imaging and MIRI imaging,
2. NIRCam imaging and NIRISS WFSS,
3. NIRCam imaging and NIRISS imaging (NIRCam must be the prime instrument),
4. NIRCam imaging and NIRSpec MOS (NIRSpec must be the prime instrument),
5. MIRI imaging and NIRISS WFSS.

Only direct imaging with standard narrow, medium, or broad band filters are allowed for NIRCam and MIRI observations in these coordinated parallel modes.

The observation specifications submitted by the GTOs must include a specific justification for any coordinated parallel observations. It should be clearly indicated whether the parallel observations are essential to the interpretation of the primary observations or the science program as a whole, or whether they address partly or completely unrelated issues. The justification will be reviewed by the STScI Director.

Further description of what defines Coordinated or Pure Science Parallels, and the restrictions on each, can be found on [JWST Science Parallel Observation Policies and Guidelines](#).

## Target of Opportunity Observations

A target for JWST observation is deemed a Target of Opportunity (ToO) if it is associated with an event that may occur at an unknown time. ToO targets include objects that can be identified in advance, but which undergo unpredictable changes (e.g., some dwarf novae), as well as objects that can only be identified in advance by class (e.g., novae, supernovae, gamma ray bursts, newly discovered comets, etc.). ToOs are generally not suitable for observations of periodic phenomena (e.g., eclipsing binary stars, transiting planets, etc.). ToO proposals must present a detailed plan for the observations to be performed if the triggering event occurs.

The science description submitted with the GTO observation specifications must include a description of any ToO observations. Those descriptions will be reviewed by the STScI Director to ensure that they are sufficiently specified so that other similar phenomena, with distinct goals, may be pursued by GO community.

The minimum turn-around time for **Non-disruptive ToO** activation, without significant impact to the schedule, is 14 days. **Disruptive ToOs** can be triggered with turn-around times less than 14 days, provided all of the proposal details (except possibly the precise target position) are available in advance. However, because of the significant effect disruptive ToO observations potentially have on the JWST schedule, each cycle will be restricted to a total of 8 disruptive activations. Moreover, due to their scheduling impact, Disruptive ToOs required to be triggered within 3 days will incur an additional overhead of 0.75 hours (45 minutes) per activation. Linked subsequent observations do not necessarily incur additional overheads, unless they are specified as **time critical visits**.

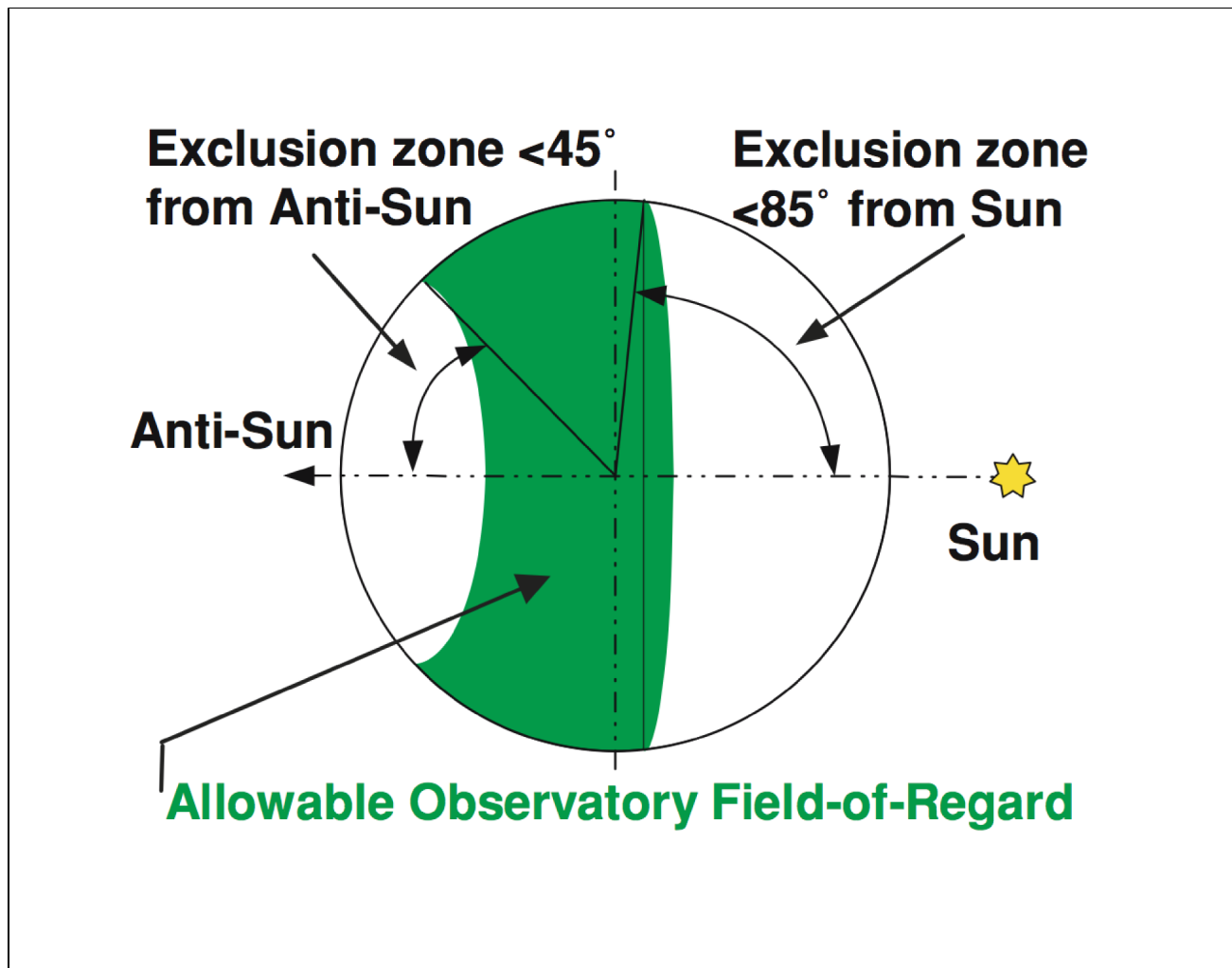
In Cycle 1, GTO programs will be limited to 2 disruptive activations, with the remaining 6 reserved for GO programs. There is no limit on the number of Non-disruptive ToOs per cycle.

Information on activating an approved target of opportunity program is in [JWST Target of Opportunity Program Activation](#).



## Solar System Observations

JWST can observe most targets within our Solar System, although there are a few exceptions. Mercury, Venus, and the Moon cannot be observed due to the orientation of JWST's sunshade. Similarly, due to limits in the observatory's allowable solar elongation angle field of regard ( $85^\circ$  to  $135^\circ$ , see schematic below), some solar system targets are visible only at set times of the year, as is the case with fixed targets.



## Time Constrained, Time Critical, and Coordinated Observations

Time constrained observations with JWST are observations explicitly required begin within a specified date and time interval. They impose restrictions on the JWST scheduling system depending on the length of the constrained interval surrounding a start date and time. **Time critical** observations are those required to start within a constrained window that is **less than 24 hours** (to be revised). Due to their impact on the schedule, time critical observations will incur an additional overhead of 1 hour per visit. Observations with

execution windows greater than or equal to 24 hours are not considered to have a significant impact on the scheduling, and therefore do not incur any additional overheads. See [JWST Observing Overheads and Time Accounting Overview](#) for a description of accounting, including Smart Accounting, and overhead terms.

There are several kinds of time constrained observations that could be considered time critical in some way. Some scientific examples might include observations of specific phases of variable stars, many transiting exoplanet observations, and some solar system observations. Observations that require a particular telescope orientation (or position angle) are implicitly time constrained as the orientation of JWST is fixed by the date of observation, for a period that is no less than 5 days. The [JWST Target Visibility Tool](#) may be useful in determining these time constraints on a fixed orientation at a given date of observation.

Coordinated JWST observations with other observatories are by definition time constrained observations, which may or may not be time critical. Linked subsequent observations do not necessarily incur additional overheads, unless they are also specified as **time critical visits** with critical scheduling windows. Linked observations that are scheduled to occur within 24 hours (to be revised) of a previous observation will be considered time critical observations, incurring the additional overhead.

Proposals may request time constrained observations for a specific date or range of specific dates, when scientifically justified. The science description submitted with the GTO observation specifications must include a description of any time constrained observations.

## Follow-up Observations of JWST Pre-Imaging

Same-cycle follow-up spectroscopic observations of sources identified through JWST imaging programs are permitted. For example, a proposal may request imaging with either NIRCam or MIRI as a means of identifying a specific type of target (e.g. high redshift galaxies) for subsequent spectroscopy with NIRSpec. In that case, the proposal must specify the anticipated number density and magnitude distribution.

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## Modifications to Observing Programs

As described in the GTO Proposal Submission Process, GTO Cycle 1 observations will be published to the community by June 15, 2017. Those observations will be submitted as observing programs through the Astronomer's Proposal Tool by September 28, 2017. Minor modifications to individual observations may be required in implementing those programs. GTO proposers may drop specific targets at that juncture, but may not add new targets. After the proposals are implemented in APT, the observations will remain frozen until the Cycle 1 GO program is announced in June 2018. The program modification policy described here comes into effect at that time.

Modifications may be requested to refine programs to better achieve the approved science goals. Modifications may also be required to accommodate changes in instrument performance with respect to that expected at the time of the proposal submission. Minor modifications to observations may be made in consultation with the program coordinator or contact scientist. Major modifications to observations are requested by the GTO Principal Investigator by submitting a Program Change Request to the STScI Director; any program modification that affects the scheduling of an observation is a major modification. Modifications may be permitted if they are scientifically justified and

have minimal impact on the overall observing schedule. All modifications to observing programs must receive explicit approval by the STScI Director or their official designee. See the [JWST Observing Program Modification Policy](#) for more information on what constitutes minor and major modifications, and the process of how these requests are reviewed.

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# JWST Cycle 1 GTO Proposal Submission Process

JWST Cycle 1 Guaranteed Time Observations (GTO) proposals are submitted in three stages: initial proposals ([Stage 1](#)), finalized observation descriptions ([Stage 2](#)), and complete technical descriptions via the [Astronomer's Proposal Tool](#) (APT; [Stage 3](#)).

By NASA Policy, each JWST Guaranteed Time Observer (GTO) is required to submit a description of the proposed Cycle 1 science program, including specific targets and specific observations, seven months before the Cycle 1 GO Call for Proposals is released. Those submissions are reviewed by the STScI Director for potential duplications. The Cycle 1 science observations are required to be finalized at a date determined by the STScI Director that is at least 2 months before the Cycle 1 GO Call is released. The GTO Cycle 1 observation descriptions will be made public at that time. Once the observation descriptions are finalized, detailed technical observing proposals are required to be submitted using the Astronomer's Proposal Tool. This document describes the processes through which those Cycle 1 submissions are made to STScI, the process for subsequent cycles and the opportunities for making changes to GTO science programs, in accordance with the policies specified in [NASA-SMD Policies and Guidelines for the Operations of the James Webb Space Telescope at the Space Telescope Science Institute](#). The total time (including overheads) requested for all JWST GTO programs must be between 25% and 49% of the total time available for all GTO and GO observing proposals in Cycle 1 ([NASA-SMD Policy 9](#)).

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## Stage 1: Initial GTO Proposal Submission

The JWST GTOs must submit proposals describing the full science program to be undertaken in Cycle 1, no later than April 1, 2017. Submissions must be coordinated as follows,

- The NIRCам PI will submit a single proposal covering the full range of science to be undertaken by all members of the NIRCам team;
- The NIRSpec Team will submit a single proposal covering the full range of science to be undertaken by all members of the team;
- The U.S. MIRI Science Lead, and each of the eight U.S. MIRI Science Team members will submit a proposal, for a total of nine proposals;
- The European MIRI Science Team will submit a single proposal covering the full range of science to be undertaken by all members of the team;
- The FGS/NIRISS PI will submit a single proposal covering the full range of science to be undertaken by all members of the team;
- The U.S. Telescope Scientist, and each of the six interdisciplinary scientists will submit a proposal specifying the full set of planned science observations for a total of seven proposals.

The proposal consist of two parts: a narrative document detailing the science investigations included in the proposal; and appropriate forms that specify the observations to be executed. [Templates for each are provided below](#) . There will no page limits for each proposal.

The narrative document specifies the PI by name, the description of the PI position (e.g., MIRI US Team Lead, Telescope Scientist, etc.) and the total wall-clock time to be charged against the PI's GTO time allocation. The document has the following sections:

**Science summary:** This section must be used to provide a short (typically 1 paragraph) description of each separate science investigation that will be undertaken within the Cycle 1 program. GTOs must identify investigations where the time will be shared between different GTO teams and specify how the time will be divided. This section will be published as an explanatory supplement with the list of science observations to provide the community with a summary of the range of science being undertaken by the GTOs.

**Scientific justification for coordinated parallel observations (if appropriate):** Coordinated parallel observations should have science goals that support or complement the prime science program. GTOs requesting such observations must provide a scientific justification. This should clearly indicate the role played by the parallel observations and whether they are essential for the interpretation of the primary observations or to the science program as a whole, or whether they address partly or unrelated issues. The justification will be assessed by an independent review panel that will make a recommendation to the STScI Director regarding their implementation. If the coordinated parallels are not implemented, the prime observations will be available for pure parallel observations. This section will not be made public.

**Detailed description of triggering conditions for Target of Opportunity Observations (if appropriate):** GTOs must provide clear definition of the specific criteria that would lead to triggering ToO observations of a particular target or phenomenon. Those criteria will be assessed by an independent review panel that will make a recommendation to the STScI Director regarding their clarity. GTOs may be requested to refine the trigger criteria should those criteria be deemed insufficiently precise. This section will not be made public.

Submissions using the JWST Astronomer's Proposal Tool (APT) are not required at this time. However, proposers should use the current version of APT (nominally APT 25.0), which includes an up-to-date calculation of overheads, in this stage of their observation planning.

The observation specifications must include the full list of proposed Cycle 1 observations, including each target, a description of the mode of observation, the expected integration time on each source and the associated overheads as given by APT 25.0, in accordance with the information requested in the instrument observation templates linked below. The proposal text will also include a scientific justification for any proposed coordinated parallel observations, and a clear description of the trigger criteria for any ToOs. Both of these sections will be subject to review by a committee of scientists selected by the STScI Director. In the case of collaborative programs between GTOs, the proposers must give a clear indication of how the total time should be divided among the PIs. Observation list templates are provided below.

Note that charged durations (including overheads) derived in developing observation specifications using versions of APT prior to 25.2 (scheduled for release June 1, 2016) will be preliminary estimates, sufficient only for planning and Stage 1 preparation. APT versions 25.2 and beyond will contain the sanctioned overheads and charge durations necessary to finalizing observation specifications, including for GTO observations, as detailed in [Stage 3](#) below.

## GTO Stage 1 Proposal and Observation Description Templates

Teams should complete the [GTO Observation Specification Workbook \[xlsx\]](#) to provide descriptions of their observations for Cycle 1. The [Guide to the Observation Specification Worksheet \[docx\]](#) gives brief details on the fields in each worksheet of the workbook. A GTO

Proposal [.docx] should accompany the workbook, to provide general science summaries, coordinated parallel justifications (if applicable), and the breakdown of total hours to charge which programs. The proposal abstracts will be made public in the [stage 2 release of the observation specifications](#).

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## Stage 2: Finalized GTO Observation Descriptions

JWST GTO observation specifications for Cycle 1 will be made public after any duplications between GTO proposals are resolved, and they are verified to be within the allocations specified by NASA policy. This process will be completed no later than June 15, 2017. The GTO observation descriptions will be published at that time, and protected from scientifically unjustified duplications in subsequent Cycle 1 Early Release Science (ERS) or General Observers (GO) observing programs.

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## Stage 3: GTO APT Program Submission

In early June, STScI will issue Build 14.1 of Proposal Processing System, including an updated version of the Astronomer's Proposal Tool (APT). GTOs must use this version of APT (nominally APT 25.2) to define the observing programs planned for execution in Cycle 1. Overhead parameters will be frozen in this version, and used in all versions of APT used to develop proposals (including those for the GO) in Cycle 1.

The GTO teams should begin their formal APT submissions (in APT 25.2) for technical review and revision on July 28, 2017. The APT reviews and revisions are likely to be an iterative process, which must be complete by September 15, 2017. The final APT files will be made publicly available on December 15, 2017. The GTO schedule in context with the full JWST Cycle 1 proposal schedule is as follows:

Release of the Cycle 1 Call for GTO Proposals	January 6, 2017
Release of the Cycle 1 Call for ERS Letters of Intent	January 6, 2017
ERS Letters of Intent due	March 3, 2017
Cycle 1 GTO Science Descriptions and Observation Specifications due	April 1, 2017
Release of the Cycle 1 Call for ERS Proposals	May 19, 2017
APT version 25.2 Released (with final Cycle 1 overhead calculations)	June 1, 2017
GTO Observation Specifications Published (public)	June 15, 2017

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GTO APT Technical Reviews and Revisions Begin	July 28, 2017
ERS Proposal Deadline	August 18, 2017
GTO APT Technical Reviews and Revisions End	September 15, 2017
ERS Results Released	November 2017
Release of the Cycle 1 Call for GO Proposals	November 30, 2017
GTO APT Files Published (public)	December 15, 2017
ERS APT Files Published (public)	December 2017
Cycle 1 GO Proposal Deadline	March 2, 2018

The APT proposals must specify detailed observations for each science target included in the science programs. Individual members of GTO teams may each submit multiple Cycle 1 GTO APT proposals. STScI will ensure that each APT is grouped with the appropriate GTO allocation. For example, the NIRCcam PI may subdivide the Cycle 1 observing program by science topic, with different team members as PIs on individual proposals; in that case, the total time charged to the NIRCcam PI will be the sum of the total time (including overheads) requested by the validated NIRCcam-team APT proposals. The Cycle 1 GTO APT files will be publicly accessible.

## JWST Cycle 2 and 3 GTO Proposal Process

The JWST GTO proposal process for Cycle 2 and Cycle 3 will require the use of the [Astronomer's Proposal Tool](#) to submit planned observation prior to the GO Calls for Proposals.

It is expected that, from Cycle 2 forward, JWST will adopt an annual cycle for standard proposal submission. The constraints imposed by the overall science timeline make a multi-step GTO proposal submission process infeasible for Cycles 2 and 3.

The Cycle 2 GTO Deadline occurs 2 months prior to issuing the Cycle 2 GO Call for Proposals; this corresponds to July 2019 under the currently planned JWST science timeline. JWST GTOs will then finalize the observations that will be included in their Cycle 2 science programs and submit the list of observations to STScI. Those programs may not include scientifically-unjustified [duplications of observations](#) planned as part of the [GTO Cycle 1 program](#) or as TAC-accepted Cycle 1 GO programs, Early Release Observations (EROs), [ERS program](#) and other accepted Director's Discretionary Time (DDT) programs. STScI will provide the appropriate tools for checking for duplications with previously accepted programs. Duplications between GTO proposals will be identified and conflicts will be resolved following the process outlined in [NASA-SMD Policy 11](#). All conflicts will be resolved prior to the release of the Cycle 2 GO Call for Proposals.

Each JWST GTO must use the [Astronomer's Proposal Tool \(APT\)](#) to define the observing programs planned for execution in Cycle 2. Specific deadlines will be provided in the GTO Cycle 2 Call for Proposals. The proposals must specify detailed observations for each science target included in the science programs. As in Cycle 1, individual GTO scientists and members of GTO science teams may each submit multiple Cycle 2 GTO APT proposals; [the time charged will be the sum of the total time \(including overheads\) requested](#) by the individual APT proposals assigned to each GTO. If appropriate, the total time charged may be adjusted to incorporate revisions in the overhead rates. The total time (including overheads) requested for all GTO programs must be less than or equal to 33% of the total time available for all GTO and GO observing proposals in Cycle 2 ([NASA-SMD Policy 9](#)). GTOs will be informed of the available wall-clock time remaining in their allocations at the start of Cycle 1 observations, one month before the Cycle 2 GTO deadline.

The final list of Cycle 2 GTO JWST observations will be made publicly available in conjunction with the GO Cycle 2 Call for Proposals. All observations included in the Cycle 1 & 2 GTO APT proposal submissions will be protected from scientifically-unjustified duplication by Cycle 2 GO programs.

Similar procedures will be followed in Cycle 3.



# JWST Observing Overheads and Time Accounting Policy

JWST observing program time allocation requests must account for the total time required to achieve science goals, including on-source integration time, direct overhead activities for a observing program, and indirect overheads associated with observations including calibrations.

## Introduction

When proposing for any observing program, astronomers must specify the time required to execute observations that will achieve the science goals of the program. In addition to on-source integration time, the time associated with various overhead activities (e.g., needed calibrations and set-up for observations) must be accounted for. This report outlines the methodology to account for, and to enable observers to compute the time required for JWST overhead activities associated with science observations as part of the proposal preparation process. Further information on overheads is provided at [JWST Observing Overheads and Time Accounting Overview](#) and [NASA-SMD Policy 8: Definition of Observing Time](#).

## General Types of JWST Overheads

Observing overheads (time not spent collecting science photons) associated with JWST science programs can be divided into three broad categories:

1. Time due to overheads directly associated with, and largely determined by, specific activities of an observer's program (hereafter OVERDIR1). These include activities such as guide star acquisition, filter and detector configuration changes, and small angle maneuvers (SAMs) to position or reposition the science target (e.g., target acquisitions, dithers). These are also known as *deterministic direct overheads*.
2. Time due to overheads directly associated with, but which are generally not solely determined by, the specifications of an observer's program (hereafter OVERDIR2). The time spent executing major slews falls into this category since visits in an observer's program may be interspersed with visits from other programs to minimize angular momentum unloads and maximize the efficiency of the observatory. Since JWST operations will be event-driven, the exact slew time to an observer's target will not be known until the observing schedule is finalized, and the observation is executed. These are also known as *statistical direct overheads*.
3. Time due to overheads indirectly incurred in general support of science observations (hereafter OVERIND). These include activities such as angular momentum unloads, wavefront sensing and control, instrument calibration, and observatory maintenance. These are also known as *indirect overheads*.

An early efficiency benchmark recommended that the sum of all overhead activities for programs in the Design Reference Mission (DRM) should not exceed ~30% of wall-clock time (NGST Monograph 5). A more recent, comprehensive description of all known overhead

activities involving each of the [four current JWST science instruments](#), the observatory, and the ground segment is given in the Science Observatory and Instrument Overheads Technical Report (Gordon et al. 2012a). There, indirect overhead activities (OVERIND) are estimated to require ~16% of wall-clock time. A preliminary study of the time required for direct overheads (OVERDIR1, OVERDIR2), based on the latest revision of the Science Operation Design Reference Mission (Gordon et al. 2012b), is described in the JWST Observing Efficiency Report Technical Report (Tumlinson et al. 2014). A key difference between the early DRM and the SODRM 2012 is the inclusion of a larger number of moderate and short duration exposures (with attendant increase in the number of visits and dithers), which is more likely to reflect actual usage in JWST's first year of science operations. The next step toward more realistic estimates of the overhead times involves scheduling studies based on the SODRM, and the inclusion of the latest results from flight hardware testing. Such work is currently in progress. The most recent Observation Efficiency Allocations Report (JWST-RPT-004166, Revision H, 2014) finds that "The usage and overhead estimates for the science use cases developed in conjunction with the Science Instrument teams and STScI SO-DRM show system-level efficiencies of 64% and 67%, respectively."

## Policies for Determining Overhead Times

In the initial 2001 Announcement of Opportunity for Next Generation Space Telescope Flight Investigations (AO 01-OSS-05), [observing time was defined for GTOs](#) to include all three types of overheads described above. Specifically, the AO states: "When estimating the duration of their GTO investigations, proposers should assume the NGST Level 2 requirement of 70% observing efficiency on the entire system (observatory plus ground system)."

Thus, to support [GTO observation planning](#), STScI must establish clear policies to account for the time needed for overhead activities (OVERDIR1, OVERDIR2, OVERIND) by a given science program, and to enable GTOs to accurately estimate this time. Since it is preferable to adopt a single system to support all users when possible, STScI will use the same [overhead accounting process](#) and proposal planning tools for GOs. The overhead accounting policy for both GOs and GTOs will be as follows. For each science program:

1. [OVERDIR1 times](#) for a specific GO or GTO observing proposal will be calculated based on the number of OVERDIR1 events required by that proposal and the estimated duration of those events. For Cycle 1 proposals, [OVERDIR1 time estimates](#) will be based on measurements taken during cryo-testing, and from simulations of activities that cannot be measured before launch.
2. [OVERDIR2 times](#) will be calculated based on the expected number of OVERDIR2 events (e.g., major slews) required by the observing proposal and an average duration of those events. For Cycle 1 proposals, the average will be based on simulations, and for proposals for subsequent cycles, it will be computed from previously executed programs.
3. OVERIND times will be computed as a rate -- a statistical assessment to account for the aggregate duration of those activities over a given cycle. It will be calculated by multiplying the sum of the integration time and OVERDIR1+OVERDIR2 by  $1/(1-f_{\text{OVERIND}})$  where  $f_{\text{OVERIND}}$  is the fraction of wall-clock time previously spent on OVERIND activities. For Cycle 1 proposals,  $f_{\text{OVERIND}}$  will be based on simulations.

The most significant OVERDIR2 activity will be due to major slews (e.g., Tumlinson et al. 2014). To calculate the number of major slews needed by a program, the [Astronomers' Proposal Tool \(APT\)](#) will analyze the requirements of all of the visits<sup>1</sup> in that program (e.g.,

positions, durations, guide star availability constraints, and determine which are likely to be scheduled together. The visits grouped in this way will be referred to as “Same Scheduling Sets” (SSS). The statistical cost of the major slews will be assessed upon these Same Scheduling Sets. The algorithms to be used to group visits into SSS is known as “Smart Accounting” and is built into the APT.

## Implementation of Overhead Accounting Policy

Implementation of this accounting policy will include the following elements:

1. The policies above, as well as the indirect overhead rate for the cycle ( $1/(1-f_{\text{OVERIND}})$ ), will be communicated in the [Call for Proposals](#).
2. The [Astronomers' Proposal Tool](#) (APT) will calculate the time required by the overhead activities associated with an observing program. APT will provide a breakdown of the overhead times as well as the total time to be requested during the [proposal process](#).
3. All times will be computed to the nearest second, and total observing time requests will be expressed and communicated to the proposer in units of hours to two decimal places. For GTOs, the total time requested by their programs will be deducted from [their global allocation](#) (as specified in the AO), after the programs are checked for duplications and finalized. For GOs, the total time requested by their programs will be provided to the TAC for review. The total time requested by TAC-approved GO programs will be deducted from the GO time available in that cycle.
4. Time will be allocated on a per program basis, but STScI Time Allocation Management will track the usage for all programs on the visit level. Programs will be tracked through execution. STScI Time Allocation Management will enable any differences from the approved allocation to be identified.
5. APT will adopt the best estimates of the overhead durations needed to compute OVERDIR1, OVERDIR2 and OVERIND, which are available at the time of the writing of the Call for Proposals for each cycle. For Cycle 1, the overhead models will be initially developed using testing of the flight hardware together with scheduling studies of the JWST Science Operations Design Reference Mission. These parameters will be stored in the JWST Project Reference Database and kept under configuration control.
6. Updates to the overhead model will be revised as needed for the JWST scheduling system as in-orbit data becomes available, but updates will be released to GOs and GTOs only at appropriate times in the proposing and observing life-cycle. The number of releases will be minimized.
7. Integration time requests of approved proposals will be generally protected against modest changes in the overhead rates through STScI Time Allocation Management. Changes to the overhead model that increase the total observing time required by an approved program by up to 10% will routinely be allowed to execute, with no change to the allocated integration time. If the overhead time requirements are lower than estimated, the programs will still execute with the allocated target integration time. For larger increases in the overhead requirements, program execution will be at the Director's discretion, which will include consideration of observatory and instrument status, and may involve changes to the approved program.
8. GTO and GO program overhead charges may need to be recalculated when the time required for overhead activities are properly established, and to compute the remaining time available in subsequent cycles to reflect actual usage. GO and GTO programs may need to be revised to account for changes in instrumental sensitivity and/or background levels. Policies in that regard will be discussed in a separate document.

## Differences from Customary Policies for Observers

JWST time allocation policies explicitly attribute the time required by indirect overhead activities to individual observing programs. The more usual policy of space- and ground- based observatories is to make such costs invisible to the user, by reducing, ab initio, the total time available for science by the time required for overhead activities such as instrument calibration and observatory maintenance. Exposing the time needed for indirect overhead activities provides total cost accounting that will allow the overall observatory efficiency to be more transparent to users, and improves general accountability. However, since this policy is not one that observers are accustomed to, STScI will take extra care to ensure that the policy and the potential impact on approved observing programs are communicated clearly.

## Related links

[JWST Observing Overheads and Time Accounting Overview](#)

[JWST Cycle 1 Proposal Opportunities](#)

[JWST Astronomers Proposal Tool Overview](#)

[Astronomer's Proposal Tool](#)

[NASA-SMD Policy 8: Definition of Observing Time](#)

## References

Lee, J., Reid, I.N., & Lotz, J.M., 2014, Overhead Accounting Policy for JWST Science Users, JWST-STScI-003986, SM-12

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Mather, J. et al., NGST Monograph No. 5: System Level Requirements, Recommendations, and Guidelines, (2000).

Mitchell, L., Observation Efficiency Allocations Report, JWST-RPT-004166, (2010).

Tumlinson, J., et al. 2014, JWST Observing Efficiency: Baseline Results from SODRM 2012, JWST- STScI-003350

2001 Announcement of Opportunity for Next Generation Space Telescope Flight Investigations (AO 01-OSS-05)

# JWST Duplicate Observations Policy

JWST proposals that request observations which duplicate planned or existing JWST observations are identified and adjudicated according to STScI/NASA policy.

## Introduction

Duplicate observations may be permitted if they are scientifically justified; in general, duplications in General Observer (GO) programs must be recommended for execution by the Telescope Allocation Committee and all duplications in General Observer (GO) programs and Guaranteed Time Observer (GTO) programs must receive explicit approval by the STScI Director.

The expected audiences for this report are the members of the GO and GTO community, the STScI Proposal Planning and Scheduling team and the STScI Webb Instrument Team. Other STScI teams may find this report useful in optimizing the design of their components of the JWST system.

Special policies apply to cases in which a proposed observation with the James Webb Space Telescope would duplicate another observation either already obtained or scheduled to be obtained. The prime purpose is to maximize the scientific return from JWST by making the most efficient use of the available observing time through minimizing scientifically-unjustified repeat observations. The goal is not to protect specific scientific programs: as with other NASA Great Observatories, JWST will execute observing programs that address the same science goals through different observation techniques if those programs are recommended for approval through the review process and approved by the STScI Director.

The policies and procedures described here apply to prime and parallel observations and to both GO and GTO programs.

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## Definition of a Duplicate Observation

An observation is a duplication of another observation if it is on the same astronomical source or field, with the same instrument in the same hardware mode (i.e. generally using the same [Astronomer's Proposal Tool](#) template), with similar sensitivity and similar spectral range. It is the responsibility of both GO and GTO observers to check their proposed observations against the catalog of previously executed or accepted observations and provide a suitable justification for any duplication.

### Single source observations

Single source observations are defined as including some coronagraphy, long-slit spectroscopy and some observations with integral field units (IFUs). A duplication is an observation of the same source with the same instrument configuration and an exposure time within a factor of 4; for present purposes, "exposure time" is defined as the total photon collection duration given by the [Astronomer's Proposal](#)

Tool. Spectroscopic observations of an individual source are flagged as potential duplications if there is major overlap (>50%) in the spectral range with previous observations of the same source. [NIRSpec fixed slit](#) or [IFU](#) spectroscopic observations can be duplications of [NIRSpec Multi-Object Spectroscopy \(MOS\)](#) observations of the same astronomical source with similar wavelength coverage and resolution.

## Areal Observations

Areal observations are defined as including direct imaging, some coronagraphy, wide-field slitless spectroscopy and some observations with integral field units (IFUs). Observations are identified as duplications if they are taken with the same instrument configuration and with an exposure time within a factor of 4, and if the telescope pointing results in major overlap (>50%) of the Field of View.

## NIRSpec MOS observations

Duplications in [NIRSpec MOS observations](#) are defined on a slit-by-slit/source-by-source basis. A duplication is an observation of a previously observed source with the same instrument configuration, major overlap (>50%) in the spectral range and an exposure time within a factor of 4. NIRSpec MOS observations of individual sources may be considered duplications of NIRSpec single-slit observations or IFU observations with similar wavelength coverage and spectral resolution.

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## Duplication Policy

Proposed observations that meet the criteria outlined above are potential duplications and should be identified as such by the GO or GTO proposer. Any such observations must be justified in the appropriate section of the proposal. *Duplicate observations are permitted if they are scientifically justified.* examples might include repeat observations of intrinsically variable objects, or duplicate imaging observations made over a time baseline to determine astrometric motions. Duplications in GO programs are generally subject to review by the Telescope Allocation Committee (TAC) and require approval by the STScI Director. Duplications between GTO and GO programs will be adjudicated by the STScI Director, in consultation with NASA Headquarters.

JWST includes instruments that offer similar instrumental configurations. In particular, [NIRCam](#) and [NIRISS imaging modes](#) have similar pixel scales and share a number of filters. Observations with different instruments are not formal duplications. Potentially-redundant cross-instrument configurations are listed in the [Appendix](#), and STScI will provide guidance to the TAC on their relative capabilities. The TAC will provide a recommendation on whether newly-proposed observations in GO programs are complementary or scientifically redundant. If current cycle GTO observations are ruled to duplicate accepted, scheduled or completed GO or GTO observations, the affected GTOs will be permitted to change their program to remove the duplication. Conflicts between GTO observations proposed in the same cycle will be resolved following the protocols outlined in [NASA-SMD Policy 11](#).

## Single Source and Areal Observations

Any *unjustified* duplications of previously executed or accepted observations that come to the attention of the peer reviewers and/or STScI could lead to rejection during or after the TAC deliberations. Without an explicit TAC recommendation to retain duplicating exposures, unjustified duplications discovered in an approved GO program can be disallowed. In such cases, no compensatory observing time will be allowed for GO programs and the associated observing time will be removed from the allocation.

## NIRSpec MOS observations

The NIRSpec MOS mode is designed to obtain observations of multiple sources in a single pointing. Duplications are identified on a source by source basis. *Scientifically unjustified* duplications are not allowed for sources with previously scheduled observations. Any such sources may be removed from the source list and may lead to rejection of specific observations after the TAC deliberations. Without an explicit TAC recommendation to retain duplicating exposures of specific sources or fields, unjustified duplications discovered in a TAC-approved program can be disallowed. Proposers may have the option of re-planning their observations with alternate sources if scheduling constraints allow and such observations are justified in the context of the original science justification.

## Duplication Checking and Review Procedures

STScI will maintain a catalogue of scheduled and completed GTO, DD (including DD-ERS), and GO observations, accessible through the standard Duplication Checking interface. The Principal Investigator is responsible for ensuring that duplications are identified and discussed in the proposal. Duplications in GO proposals will generally be subject to review by the TAC and require explicit approval by the STScI Director. Duplications of accepted, scheduled or completed GO and GTO observations in GTO proposals will be adjudicated by the STScI Director. Conflicts between GTO observations proposed in the same cycle will be resolved following the protocols outlined in [NASA-SMD Policy 11](#).

## Single Source Observations

**Duplications with previous programs:** Potential duplications with scheduled or completed GO or GTO observations should be identified by using the Duplication Checking interface to search for past observation of the same source with the same instrument configuration and an exposure time within a factor of 4; and spectral overlap by more than 50%. Any duplicate observations must be identified and justified in the proposal.

**Same cycle GO duplications:** Potential duplications between proposals submitted in the same cycle will be identified by STScI. That information will be communicated to the TAC.

**Table 1: Areal Observations - default duplication search radii**

Observing Mode	r (arcsec)	Observing Mode	r (arcsec)
NIRSpec MOS	180	NIRSpec IFU	4



MIRI Imaging	120	MIRI MRS	4
NIRISS WFSS	140		
NIRCam Imaging	280		

**Duplications with previous programs:** Duplicate areal observations are identified through a two-step process. Observations are flagged by the Duplication Checking interface as potential duplications if the target coordinates lie within a specific radial distance of a scheduled or previously executed observation. Table 1 lists the radial offsets adopted for each JWST instrument. Observations that are flagged as potential duplications should be checked and discussed in the proposal.

**Same cycle GO duplications:** Potential duplications between proposals submitted in the same cycle will be identified by STScI. That information will be communicated to the TAC.

## NIRSpec MOS observations

Duplications in NIRSpec MOS observations are identified through a two-step process. Observations will be flagged as including potential duplications if the telescope pointing results in a field of view overlapping with a scheduled or completed observation made with the same instrument configuration and an exposure time within a factor of 4 of the proposed observation. Once identified, the individual slit positions should be checked to determine whether there are sources in common between the two observations.

**JWST pre-imaging:** Some programs will depend on imaging with JWST cameras to identify targets for follow-up spectroscopy. Those observations should be included in the proposal unless appropriate data will be available to the proposing team at the start date of the observing cycle. If multiple proposals require duplicate imaging data of the same field, the Director may consolidate the proposed imaging observations and make the appropriate data available to all parties for target selection, subject to the restrictions and priorities outlined below.

**Duplications with previous programs:** Proposers should check for potential duplications with scheduled or completed GO or GTO MOS observations by using the Duplication Checking interface to search for past telescope pointings that use the same instrument configuration, have exposure times within a factor of 4 and overlap the Field of View of the proposed observations. *Duplications are identified on a source by source basis.* A proposed MOS observation that covers the same field of view as a previous observation but includes no astronomical sources in common is not a duplication. Proposed observations of sources that are included as targets in scheduled or completed programs are duplications and must be identified and justified in the proposal.

Source lists for all accepted or scheduled NIRSpec MOS observations may not be available at the submission deadline, since some programs use JWST pre-imaging to identify their sources; those observations and the subsequent source selection may not have been completed. *This does not preclude observations of targets in the same field of view by other programs.* In such cases, the scheduled program should be identified and the potential for duplication described in the “Justify Duplications” section of the proposal. The TAC will review the scientific goals of the previously scheduled program, and will provide clear guidelines and priorities on source selection for any

additional programs recommended for approval in the current cycle; those priorities will be communicated to the proposers as mandatory comments. Any such programs will not be approved for execution until final source lists are available for both programs; unjustified duplications with the previously-scheduled program will be disallowed.

**Exceptions:** MOS observations provide the potential to expand observations beyond the core science program without additional overhead by adding observations of additional sources within the targeted field of view. In order to maximize the scientific return from JWST, duplicate observations of individual sources may be justified in some cases. Any such sources should be identified in the Justify Duplications section of the proposal and will be subject to review by the TAC for GO proposals and to final adjudication by the STScI Director for GO and GTO proposals.

**Same cycle GO duplications:** Potential duplications between NIRSpec MOS proposals submitted in the same GO cycle will be identified by STScI, who will flag proposals that use the same instrumental configuration, have exposure times within a factor of 4 and telescope pointings that result in Fields of View that overlap by more than 50%. The TAC will review those proposals and determine whether there is likely to be duplication in the source list. If two or more programs with overlapping Fields of View are recommended for acceptance, the TAC must provide a clear statement of the prime scientific goals for each and, if necessary, the relative priority of each proposal. The TAC will communicate those constraints to the Principal Investigators as mandatory comments concerning the implementation of the respective science programs. This feedback will be used as the basis for resolving any conflicts that might arise in scheduling the observations.

If two or more GO programs are accepted for observations of the same field in the same cycle, the Principal Investigators will be informed and will be encouraged to co-operate. If appropriate, they will share pre-imaging observations. They may also choose to pool their resources and share source lists to optimize the observations. In that case, both teams will have exclusive access to the data acquired for both programs.

If cooperation is not acceptable to either PI, the source lists from the programs will be matched to identify duplications. The STScI Director will take into account the scientific priorities set by the TAC in determining which observations will be disallowed.

**Final target list:** The list of accessible targets for MOS observations may be dependent on external circumstances, such as scheduling constraints. In all cases, the final target list for GO and GTO programs will be subject to approval by the STScI Director.

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## Embargoed observations

Under exceptional circumstances, duplicate observations may be held in embargo for a short period. Any such decisions will require formal approval by the STScI Director.

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## Appendix: Cross-instrument Comparisons

## Imaging: NIRCam and NIRISS

The [Imaging mode of NIRISS](#) makes use of flight spare filters from [NIRCam](#) and is an integral part of observing in the [Wide-Field Slitless Spectroscopy \(WFSS\) mode](#). In general, [NIRCam](#) is the camera of choice for near-infrared imaging with JWST, since it has twice the field of view of [NIRISS](#) and obtains short-wavelength and long-wavelength images simultaneously. If used [in parallel](#) with [NIRCam](#) during programs involving deep imaging, [NIRISS](#) would provide a third near-infrared imaging channel with matched filters.

- [NIRISS](#) has a field of view of 2.2' x 2.2', with a plate scale 0.065"/pixel.
- [NIRCam](#) has two modules, each with a field of view of 2.2' x 2.2'. The plate scale is 0.032"/pixel in the short wavelength channel (0.6–2.3  $\mu$ m) and 0.065"/pixel in the long-wavelength channel (2.4–5.0  $\mu$ m).

The filters in common are as follows:

- [NIRISS/NIRCam](#) short wavelength channel: F090W, F115W, F150W, F200W, F140M
- [NIRISS/NIRCam](#) long wavelength channel: F277W, F356W, F444W, F430M, F480M

## Spectroscopy: NIRCam and NIRSpec

- The [NIRCam grism](#) installed in the long wavelength channel can be used to obtain slitless spectroscopy over the wavelength range 2.4 – 5  $\mu$ m, with resolution  $R=2000$ .
- The [NIRSpec G395M](#) and [G395H](#) gratings cover the wavelength range 2.9 to 5  $\mu$ m with resolution  $R=1000$  and  $R=2700$ , respectively.

## Related Links

[NIRSpec Multi Object Spectroscopy](#)

[NIRCam Imaging](#)

[NIRCam Wide Field Slitless Spectroscopy](#)

[NIRISS Imaging](#)

# JWST Science Parallel Observation Policies and Guidelines

JWST science parallel observations aim to maximize the science return of JWST by obtaining data from multiple JWST instruments simultaneously. Parallel observations can be implemented in two modes: Coordinated Parallels, where both prime and parallel observations are part of the same program with a single Principal Investigator (PI); and Pure Parallels, where the prime and parallel observations are separate programs with separate PIs.

## Introduction

This report describes the policies that will be employed by Space Telescope Science Institute (STScI) in implementing science parallel observations with the James Webb Space Telescope (JWST). Science parallel observations aim to maximize the scientific return from JWST by operating multiple instruments simultaneously. Parallel observations can be implemented in two modes: Coordinated Parallels, where both prime and parallel observations are part of the same program with a single Principal Investigator (PI); and Pure Parallels, where the prime and parallel observations are separate programs with separate PIs. All parallel observations are subject to scientific review; parallel observations proposed as both General Observer (GO) and Guaranteed Time Observer (GTO) programs must receive explicit approval from the STScI Director. The expected audiences for this report are the members of the GO and GTO community, the STScI Proposal Planning and Scheduling team and the STScI Webb Instrument Team. Other STScI teams may find this report useful in optimizing the design of their components of the JWST system.

The JWST scientific instruments lie in fixed positions within a common focal plane. It is therefore possible to increase the scientific productivity of JWST by conducting observations simultaneously with one or more instruments *in addition* to the primary instrument. Those additional observations are called *parallel* observations. Parallel observations have been possible with only one previous NASA Great Observatory, the Hubble Space Telescope (HST). The policies and procedures outlined in this document are based on the experience gained and are modeled closely on those adopted for HST.

Each instrument samples a different portion of the JWST focal plane. An instrument used in parallel mode will normally be pointed at a “random” area of sky several minutes of arc from the primary target. Consequently, parallel observations are usually of a survey nature. However, many targets lie within extended objects such as star clusters or galaxies, rendering it possible to conduct parallel observations of nearby portions, or even specific targets, within these objects.

Depending on whether a parallel observation is related to a specific primary observation, it is defined as either a *Coordinated Parallel* or a *Pure Parallel*. Coordinated Parallels are related to a particular primary observation in the same proposal. Pure Parallels are unrelated to any particular primary observations (i.e. the primary observation is in another program).

Parallel observations are rarely permitted to interfere significantly with primary observations; this restriction applies both to concurrent and subsequent observations. Specifically:

- A pure parallel observation cannot dictate how the primary observation will be structured (e.g. it cannot cause the adjustment of primary exposures). The definition of the parallel observation is independent of and subordinate to a primary observation.

- Parallel observations will not be made if the stored command capacity or data volume limits would be exceeded.
- Pure Parallel observations may not explicitly constrain the scheduling of the primary observations; that is, they may not specify orientations or timing constraints.
- Coordinated Parallel observations may include orientation or timing constraints as requested and justified in the accepted JWST proposal.
- Pure Parallel observations are subject to the availability of parallel observing opportunities as identified by STScI.

The policies and procedures described here apply to both GO and GTO programs.

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## Coordinated Parallel Observations

Coordinated Parallels use one or more instruments in addition to and simultaneously with the primary instrument in the same proposal e.g. to observe several adjacent targets or regions within an extended object. Proposal that include Coordinated Parallel observations must provide a scientific justification for and description of the parallel observations. It should be clearly indicated whether the parallel observations are essential to the interpretation of the primary observations or the science program as a whole, or whether they address partly or completely unrelated science goals. The proposal must also address the reduction and analysis of the parallel observations, including the priorities assigned to those activities and the expertise available in the proposal team. GO Coordinated Parallel observations are subject to scientific review by the Telescope Allocation Committee (TAC) and must be approved by the STScI Director; all GTO Coordinated Parallel observations are subject to scientific review by the STScI Director, working in coordination with the NASA Headquarters JWST Program Scientist. Parallel observations can be rejected even if the primary observations are approved.

Proposers are generally not allowed to add Coordinated Parallel observations that were not explicitly included and approved as part of the initial proposal submission. Any such requests will be adjudicated by the Telescope Time Review Board (TTRB).

Coordinated Parallel observations will ordinarily be given the same exclusive access period as their associated primary observations.

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## Pure Parallel Observations

The Pure Parallel observing process is designed to take advantage of the full complement of instruments available on JWST. Similar to primary science planning, STScI will provide an estimate, in advance of observations, of the number of hours that are likely to be available to accepted parallel programs during the upcoming cycle. GO and GTO primary observations without associated Coordinated Parallels will generally be available for scheduling Pure Parallel observations; in some cases, the constraints of the primary observations may not be compatible with supporting parallel observations.

## Restrictions

Pure Parallel observations can be proposed for scheduling with any primary instrument on JWST. Proposals are limited to operating one instrument in parallel mode: i.e. parallel observations can be proposed using either [NIRSpec](#) or [NIRCam](#) or [MIRI](#) or [NIRISS](#), but cannot be proposed for any combination of those instruments. Pure Parallel programs must specify a minimum total on-target time for the

primary observations.

## Review and Execution

Pure Parallel programs are GO programs that must be submitted in response to the annual JWST Call for Proposals. The review panels and the TAC will select Pure Parallel science. The TAC will consider all accepted programs and produce a ranked list as an aid for resolving potential conflicts. All GO Pure Parallel Programs will be non-proprietary, with no exclusive access period by default. Proposers may request an exclusive access period; that request is subject to review by the TAC. Pure Parallel observations are assigned to specific primary observations, and the parallel observations will be carried over to subsequent cycles if the primary observations are not executed in the upcoming cycle.

Subsequent to the JWST TAC review, PIs with accepted Pure Parallel Programs will be given a list of parallel science opportunities that STScI has identified as being suitable for their program. The PI then selects and submits a final list of observing opportunities to STScI; the Pure Parallel observations will be matched to the primary observations during the planning and implementation phase. Proposals for Pure Parallel observations may specify either particular or generic targets, although the latter are more common and provide more flexibility for matching parallel observations to actual opportunities.

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## Parallel Observations in Early Cycles

The [Astronomer's Proposal Tool](#) will provide observing templates for Coordinated Parallel observations for a subset of instrument combinations in Cycle 1, with additional templates becoming available in subsequent cycles. Those templates will allow proposers to develop detailed observing schemes that optimize the observations obtained with both instruments e.g. dithering patterns will be available that optimize the spatial sampling on both detectors.

GO and GTO proposers may propose for Coordinated Parallels only if the specific instrument/mode combination is allowed in the Call for Proposals for that particular cycle.

In Cycle 1 both Coordinated Parallel programs and Pure Parallel programs are limited to using no more than two instruments i.e. Coordinated Parallel observing proposals may request observations with a single primary and a single parallel instrument; Pure Parallel proposals may request observations with only a single instrument.

All Pure and Coordinated Parallel observations must be approved by the STScI Director.

## Related links

[JWST Cycle 1 Proposal Opportunities](#)

[JWST Astronomers Proposal Tool Overview](#)

[Astronomer's Proposal Tool](#)



# JWST Observing Program Modification Policy

JWST observing programs may be modified or refined to better achieve approved science goals, or to accommodate changes in instrument performance. All modifications to observing programs must be approved by STScI.

## Introduction

Modifications may be requested to refine programs to better achieve the approved science goals, and modifications may also be required to accommodate changes in instrument performance with respect to that expected at the time of the proposal submission. Minor modifications to observations may be made in consultation with the program coordinator and/or contact scientist. Major modifications to observations are requested by the Principal Investigator submitting a Program Change Request (PCR). PCRs for GO programs must be submitted to the Telescope Time Review Board; PCRs for GTO programs must be submitted to the STScI Director. Modifications may be permitted if they are scientifically justified and have minimal impact on the overall observing schedule. All modifications to observing programs must receive explicit approval by the STScI Director or their official designee.

The expected audiences for this report are the members of the GO and GTO community, the STScI Proposal Planning and Scheduling team and the STScI Webb Instrument Team. Other STScI teams may find this report useful in optimizing the design of their components of the JWST system.

## JWST Long Range Plan Scheduling

After launch and following a period of commissioning, JWST will begin the execution of science observations for GO, GTO, and DDT programs. Each observation will be scheduled as one or more visits for a specific astronomical target, which after constraints are set, will be laid out on the JWST Long Range Plan (LRP); combining visits to maximize the observing efficiency of the observatory, while minimizing the build-up of angular momentum. Modifications to the science duration (sum of exposure times) or the overhead duration (sum of acquisitions, motions of components, and detector reads) of a given visit may change its scheduling duration and therefore impact the ability to schedule the visit efficiently on the LRP.

## Modification Principles

Principal Investigators of GO, GTO and DDT programs may request modifications to their program to maximize the scientific value of an approved observation. Additionally, deviations in on-orbit performance with respect to expectations may require modifications to approved visits. Such modifications may impact either or both the science case and the ability to schedule observations in the LRP; they are therefore subject to review following the procedures outlined in this document. The guiding principles underlying these procedures are:

- All programs executed by JWST are reviewed and approved through an appropriate mechanism. The process described below is intended to ensure that the modified program, as executed, maintains the original science goals, avoids unnecessary duplicate



observations and does not have a disproportionate impact on the LRP.

- All modifications to GO and DDT programs requested by the PI for scientific reasons shall be such that the program stays within its originally allocated total charged duration assigned to the program; modifications to GTO programs are limited by the total time allocated to the appropriate PI.
- Modifications requested to GO and DDT programs to mitigate changes in instrument/telescope performance may not increase the charged duration of a program by more than 10%; modifications to GTO programs are limited by the total time allocated to the appropriate PI.

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## Modifications Requested by the PI for Scientific Reasons

The Principal Investigator, according to the precepts and schedule outlined below, can request modifications to an approved visit or visits within a program. All requests for modifications of observations will be subject to review by the JWST Telescope Time Review Board (TTRB) and the JWST Science Policies Group. There are two types of modification:

**Minor modifications** to observations consist of small changes in the observational parameters, such as adjustments of a few arcseconds in celestial coordinates, optical element changes or revisions in the distribution of science exposure times. Minor modifications might also include changes in instrumental parameters (e.g. sampling sequences) provided that those changes do not alter the scientific content of the original program. Any such modification may not result in the duplication of an approved observations.

Requests for minor modifications may be made in consultation with the program coordinator or contact scientist. In general, these requests will be communicated to the JWST Science Policies Group but will not require review by the TTRB. Minor modifications may neither increase the total duration of the program nor impact the scheduling of observations; if those criteria are not met, the requested changes will be reviewed as major modifications. Minor modifications to observations may not be permitted within 20 days of the scheduled date of observations.

**Major modifications** to observations consist of changes that would either substantially alter the scientific content or intent of observations, or have an impact on scheduling within the LRP. Examples of major changes include:

- Changing the instrumental mode for an observation (e.g. from NIRCIm Imaging to MIRI Imaging);
- Changing the target coordinates, or boundary area, by an astronomically significant amount;
- Changing the target to a different astronomical source judged by the investigator to be scientifically equivalent to the original target;
- Changes to any parameters that may have a major impact on schedulability, including, but not limited to, revised orientations, additional links to other observations and significant re-balancing of time among observations within the same program.

The execution of an approved observation may become infeasible or prove to be scientifically of limited value due to unanticipated circumstances. If such events occur, and if an observer can a priori demonstrate that the approved visit will yield minimally useful data, the Principal Investigator can submit a request to make major modifications to the program. The proposed modifications must be consistent with the original scientific intent of the approved observation and the observing time granted. In addition, the revised observation may not duplicate any other approved observation without an appropriate justification, and must be approved by the STScI Director.

Proposers requesting target changes are generally limited to targets that were known at the time of the original proposal submission. Exceptions may be made for NIRSpec MSA observations based on JWST pre-imaging. Other mechanisms will be provided for observations of newly discovered targets. GTO proposers who eliminate observations of a target from their current cycle program may not add observations of that target to their list of protected observations for future cycles.

Modifications to visits within an observation generally may not be requested once the observation has started to execute. Under exceptional circumstances, the Principal Investigator may request that unexecuted visits within a given observation are removed from the schedule.

All requests for major modifications of approved observing programs must be submitted as Program Change Requests for review by the JWST TTRB, and must be accompanied by an adequate justification. Changes in target will require particularly strong justification and may not be permitted during the period when new proposals are being solicited or are under review. The TTRB will make a recommendation to the JWST Science Policies Group lead and/or the STScI Director. Modifications are contingent upon approval by the STScI Director, or designee. Once the request for a modification is approved, the Principal Investigator may modify the visit/program. Major modifications to visits may not be permitted within 20 days of the scheduled date of observations.

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## Modifications due to changes in instrumental performance

Circumstances may arise where the actual performance of a JWST instrumental mode differs significantly from that anticipated at the time of acceptance of a GO, GTO or DDT proposal. In such cases, Principal Investigators will have an opportunity to modify program visits to accommodate the performance changes. Proposers may choose to re-balance the time allocated within the proposal to different instrumental modes; however, the revised program must be consistent with the scientific goals approved for the original proposal. Proposers may request increased observing time for specific instrument modes, but the increase in the total time charged to GO and DDT proposals must be less than 10% of the total time allocated to that program. GTO proposers have more flexibility in re-allocated time to different observing modes, but may not make changes that exceed the total time allocated to the individual Principal Investigator.

Modifications for instrumental performance should be requested by submitting a Program Change Request. All such requests for GO and DDT proposals will be reviewed by the TTRB, whose recommendations will be passed on to the JWST Science Policies group and the STScI Director or designee for final approval. Requests for changes to GTO proposals will be subject to approval by the STScI Director. Modifications to visits may not be permitted within 20 days of the scheduled date of observations.

Observers may also be required to modify programs due to the unavailability of a subset of the instrumental modes requested by that program. Those programs will be dealt with on a case by case basis, but under most circumstances any additional overhead (for example, due to additional target slews) will likely not be charged to the program.

## Related Links

[JWST Cycle 1 Proposal Opportunities](#)

[JWST Cycle 1 General Observers Call for Proposals](#)



# Policies for the Telescope Time Review Board

The JWST Telescope Time Review Board (TTRB) reviews requests to change accepted JWST programs, duplicate observations, repeat observations, and other program alterations. This page also describes process for Operation Problem Reports (OPRs), Program Change Requests (PCRs), and requests for Resolution of Data Duplications (RDDs).

## Process for Reviewing Program Changes

Changes to approved JWST programs are evaluated, discussed, and reviewed by the Telescope Time Review Board (TTRB), which is composed of staff members from the STScI divisions that schedule the telescope and support science observations.

The TTRB makes recommendations based on the policies in this document, and in the [JWST Observing Program Modification Policy](#). The TTRB exists to maximize the science return of JWST within approved policy, but has limited latitude to deviate from established precedent. TTRB recommendations are forwarded to the Head of the Science Policies Group (HSPG) for approval. Following this review, the TTRB acts to carry out the final decision that has been made.

## The Domain of the TTRB

Observing time on JWST is allocated by the Director of STScI. Ordinarily this is done in one of three ways:

1. Through a Call for Proposals, with review by a TAC;
2. Following a submitted proposal for Director's Discretionary Time, after suitable scientific review;
3. Through an internal review of calibrations that are requested and defined by the instrument teams.

Each of the above three ways leads from a submitted proposal to an approved program, with a specific allocation of JWST time, ordinarily in units of hours. Also, specific programs are approved to observe specific targets with particular instrument modes and parameters.

Inevitably changes must be made in some programs after they are accepted, and the TTRB exists to review these and make recommendations to the HSPG, who may approve on behalf of the Director's Office. Some of the reasons for changes include:

1. Failure of an observation. The failure or anomaly may have occurred during program implementation, in the ground system, or as a problem on the spacecraft.
2. Alteration of a program to use a different filter, grating, or even a different instrument.
3. Addition of a new target to a program or changing one target for another.
4. Changes that result from knowledge of the SI or telescope that was not available at the time the proposal was written, requiring, possibly, additional telescope time to achieve the approved science goals.

Some of these changes are minor and need only the approval of the program coordinator or Contact Scientist, but major alterations to a program require formal approval. Full details are given in the [JWST Program Modification Policy](#).

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# Types of Program Alterations Treated

## Reporting Mechanisms and Procedures

Matters come to the attention of the TTRB through a formal reporting mechanism that is invoked using a web form. The program Principal Investigator (PI), or designee, enters basic program information, an explanation of the nature of the action requested, and the reasons for the action. The web submission software adds additional program information from a database, and the members of the TTRB are notified that a new request has been submitted through automatic e-mail.

The Chair of the TTRB, in collaboration with the other members of the TTRB, reviews the request and prepares a recommendation. A CS, Program Coordinator (PC), or other STScI experts may be consulted as needed during this review. After the appropriate consultation has taken place, the Chair may, if necessary, request further information or clarification from the PI. The recommendation of the TTRB that was reached through this process is communicated by the Chair to the HSPG for concurrence. In some cases, the HSPG may modify the recommendation. Upon concurrence, the Chair of the TTRB notifies the PI of the outcome.

## Types of Issues Treated

All the issues treated by the TTRB are reported with the same mechanism, and at the time it is submitted it is assigned a tracking number through the STScI Problem Reporting System, of the form OPR Number 12345, Duplication Report Number 12345, or Change Request Number 12345. A different form exists for each type of request.

## Operations Problem Report (OPR)

Proper documentation of OPRs is vital for follow-on studies that enable us to reduce causes of failed observations. Policies and procedures for OPRs are well established and are described in [OPR Procedures](#) below.

## Program Change Request (PCR)

Most changes to programs that are made after submission and acceptance are minor alterations, such as changing an exposure time, using a different filter, or adding certain Special Requirements. As described in the [JWST Observing Program Modification Policy](#), these types of minor modifications may be approved by an CS without further review, and some may be implemented by the PC. For those PCRs involving minor instrument technical issues, the relevant instrument team will be consulted and may provide a recommendation to the TTRB on the resolution of the PCR. Procedures for are described in [PCR Procedures](#) below.

For program changes that are clearly significant, as defined in [JWST Observing Program Modification Policy](#), the PI must initiate a formal Program Change Request. These types of alterations ordinarily require a PCR:

1. Increasing the allocation of primary or parallel time above the numbers allocated by the Director. Requests for increases in primary hours will be rare and will require strong scientific justification.
2. Contesting a mandatory comment made by the TAC.

3. Adding a target to a program. Reallocation of time among an already-approved list of targets (i.e., if they were specified in the proposal) may also require TTRB approval if the reallocation might have a significant impact on schedulability.
4. Changing instruments or a significant change of instrument mode.
5. Adding limited-resource Special Requirements that were not indicated in the proposal. These include CVZ, TOO, SHADOW, and LOW SKY.
6. Adding other options, parameters, or Special Requirements that substantially increase the constraints on scheduling a program.
7. Any change that requires an observation to be made outside of the nominal start or end times of the Cycle for which it is approved, or any request by a PI to start a program before the start, or after the end, of the Cycle. Multi-year programs are, by definition, pre-approved to extend beyond a single Cycle boundary.

STScI's concerns are in two areas. First, we wish to understand if a change significantly alters our ability to schedule an observation. Second, the Institute needs to ensure that a change does not go beyond the scope of the program originally proposed and does not infringe on the science of another program.

## Resolution of Data Duplication (RDD)

A GO, CS, or PC can file an RDD whenever they feel that two separate observations in separate programs may duplicate one another, or if there are conflicts in data rights that arise.

We will expect GOs to investigate for other current-Cycle programs that may conflict with their own, and the RDD is the mechanism for adjudicating these.

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## OPR Procedures

An OPR is ordinarily submitted by an observer, but may also be submitted by an Instrument Scientist (IS) or Program Coordinator (PC), or, possibly, a Co-I, especially one who happens to be an STScI staff member. In any of these cases the OPR will be considered to have been effectively submitted by the PI. An OPR is submitted when a problem is found with the observation, either in the way the observation was (or was not) executed, or in the data received.

## Automatic Repeats

An OPR generally requests that an observation be repeated, but some failures are of a nature which makes a OPR unnecessary. Such errors are identified immediately after the observation fails and are automatically rescheduled. However, an automatic rescheduling only occurs if the visit had no science data at all obtained and no guide star acquisition was attempted. Failed observations that have been automatically rescheduled are made known to the TTRB for nominal review.

Failures which are eligible for automatic repeat are

1. Visits affected by a spacecraft or instrument safing event, as long as the entire visit was lost and as long as the program itself did not cause the safing.
2. Visits lost due to other spacecraft malfunctions, as long as the entire visit was lost and as long as the program itself did not

cause the malfunction.

## **Policies for Granting Requested Repeats of Observations**

### **Type of Observation**

Repeats are not normally granted if the failed observation was a SNAP observation

### **Completeness of program**

Repeats are not ordinarily granted if a program is already 90% complete. "Complete" here means that 90% or more the observing time allocated to the program has been successfully executed at the time the OPR is evaluated. Scheduled observations that have not yet executed are not ordinarily counted as "complete," although they may be in some circumstances as, for example, when the lifetime of an instrument is near an end and the remaining schedulable time is highly constrained.

The failure of less than 10% of a program's orbits is not grounds for automatic rejection of an OPR. However, an OPR that requests more than 90% completion needs to indicate clearly why the repeated observations are essential to achieving the scientific goals outlined in the original proposal.

### **Incorrect target coordinates**

A program's PI is responsible for generating target coordinate charts in APT so that the PI may verify the coordinates of the target being observed. Some targets (especially bright ones) may be difficult to evaluate on these charts, but in all cases the PI remains responsible for supplying complete and correct target coordinates in the proper units, and the source of those coordinates must be included as well. In the case of targets with significant proper motion, the PI is responsible for providing both the epoch of the coordinates and the proper motion values in the correct units. Therefore, OPR requests that involve incorrect target coordinates or proper motion values are not ordinarily approved.

### **Program error by STScI**

If the observation failed due to an error originating within STScI, or an operational problem with the telescope, repeats are ordinarily granted. In some cases, such as instrument failures or other hardware problems, repeats may be undertaken automatically.

### **Program error by PI**

If the failure was caused by an error that can be shown to originate with the PI (or designee), then a repeat will not be granted. STScI attempts to detect observer error on a best- efforts basis, but errors nevertheless remain the PI's responsibility.

## High-risk observations

Some accepted programs are unusually difficult to implement or may face a higher-than-normal chance of failure. In these cases the PI will be notified before the observations are obtained, and the observations are then executed on a shared-risk basis. This means that repeats will not ordinarily be granted if an observation fails. In some cases, high-risk programs may be brought before the TTRB before they are implemented.

## Release of Data

Under most circumstances, if a repeat is granted then the original (“failed”) observations will be made immediately available to the public in the archive. If a repeat is granted for an entire program, then all of the data acquired so far are released. The intent is that if the observations are good enough to do the science that the PI proposed then they should not be repeated, and that a PI should not be given preferential access to duplicate observations. Thus if a repeat is given, the data are acknowledged to be inadequate for the original purposes and may therefore be made freely available without impairing the PI’s science goals. The PI may request a repeat with no release of the original data, but supporting arguments must be provided.

## Deadlines for OPR Submission and Program Resubmission

OPRs must be filed within 90 days of the date when the affected observations failed. A repeat will not be granted if this period is exceeded unless the PI can provide clear evidence of why it was impossible to file the OPR within the 90 days. In cases where the end of an operating mode is imminent, a specific OPR deadline may be imposed beyond which no OPRs whatsoever for that instrument will be accepted simply because repeats cannot be scheduled.

If a repeat has been granted, the PI has six weeks in which to supply a revised program. If no changes to the original observation are needed, a new submission is not necessary, but the PI must still contact the PC to so indicate.

## Change Request Within OPRs

A request to repeat an observation may also include a request to change the way in which the observation was obtained or the target observed. Such change requests after the fact are unlikely to be granted unless convincing arguments are presented that require the changes to be made to the observing plan (as opposed to changes that improve the observing plan). In other words, Change Requests should be filed well before observations are taken.

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## Program Change Requests (PCRs)

A formal PCR should be filed whenever an alteration to a program significantly changes its ability to be scheduled, if a limited resource is requested, or if a change might result in a data conflict or duplication issue. See [JWST Observing Program Modification Policy](#) for further details.



## Late change requests

A Change Request to a program must reach STScI at least four weeks before the first day of the planning window for that proposal. If a Change Request is received after this date and the observations then fail because the change was not implemented, no repeat will be given. Even if STScI agrees to attempt a late implementation of a Change Request, it is done on a best-efforts basis and the PI is still responsible for the error if problems arise.

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## Duplication or Data Conflict Resolution

An RDD is the mechanism for bringing a duplication to the attention of the TTRB. The grounds for declaring a potential duplication are established elsewhere (see the most recent JWST Call for Proposals).

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## References

Adopted from *Policies for Telescope Review Board*, rev. January 28, 2015, Taylor and Soderblom. Available on the [HST Changing Programs & Resolving Problems](#) site.

# JWST Target of Opportunity Program Activation

JWST observers must submit an Activation Request to STScI in order to trigger an approved Target of Opportunity (ToO) program. STScI evaluates the effect of the ToO's interruption on the JWST schedule and how well the observations of this event meet the approved science goals before approval and activation of the ToO.

## Requesting Activation

The Principal Investigator (PI) or designated alternate initiates activation of a Target of Opportunity (ToO) proposal by submitting an [Activation Request \(.docx\)](#). In the request the PI identifies which visit (or visits) to activate and supplies all the information needed to implement and schedule the observation. This information should include target position, instrument filter/grating combinations, exposure times, and any scheduling requirements not already included proposal.

**Because there may be critical implementation questions, you must let STScI know where you can be reached 24 hours a day.**

After submitting the request, the PI (or alternate) must contact their Program Coordinator (PC) and verify that the activation request has been received by the Institute. The PC verifies receipt of the activation request and discusses with the PI any remaining questions on observation and scheduling requirements.

## Evaluation and Implementation

STScI evaluates the effect of the ToO's interruption on the JWST schedule and how well the observations of this event meet the approved science goals. The STScI Director then makes the final decision whether to activate a ToO. The CS, the PC and Short Term Planning conduct a review of the proposal to assure the safety of the observations, to verify that the program complies with the observing time allocation and to identify execution opportunities.

## Related links

[HST Target of Opportunity Activation Request Form](#)

[JWST Target of Opportunity Observing](#)

# NASA-SMD Policies and Guidelines for the Operations of JWST at STScI

In accordance with Contract NAS5-03127, Statement of Work, Section A.4, A.5, the following guidelines are policies promulgated by the NASA Associate Administrator (AA) for the Science Mission Directorate (SMD) with regard to the implementation of the JWST science mission. Any reference to JWST Program or Project refers to the NASA JWST Program or Project unless explicitly noted otherwise.

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## Approved by:

Edward J. Weiler, Associate Administrator, Science Mission Directorate, NASA Headquarters.

Jon A. Morse, Director, Astrophysics Division, Science Mission Directorate, NASA Headquarters.

Eric P. Smith, JWST Program Scientist, Science Mission Directorate, NASA Headquarters.



## Policy 1: Limitations on the Use of Funds for the Research of General Observers (GT) and Archival Research (AR)

Funding allocated to the Space Telescope Science Institute (STScI) by NASA for support of the research of General Observers (GO) and Archival Researchers (AR) is intended to be used for the acquisition, calibration, analysis, and publication of JWST data. Funding for preparatory observations (e.g., ground-based) must be justified within this intention. Funding of observational research by GOs or ARs with other facilities (ground- or space-based) that is considered essential for the preparation for JWST observations must receive specific approval by the STScI's Financial Review Committee.

It is anticipated that many JWST programs will demand ground-based follow-up observations. Support for such research is largely within the charter of the National Science Foundation (NSF). However, a small amount of funding may be requested by General Observers or Archival Researchers who determine the necessity of such research. Any such request must be less than 10% of the their total requested funding. The justification for how the ground-based follow-up observations are needed to maximize the scientific value of the JWST observations will be evaluated by the peer review panel.

GOs or ARs at U.S. institutions who are not eligible to seek support through the National Science Foundation may apply for funding to STScI for ground-based follow-up observations as part of their JWST program budget request.

## Policy 2: Data Rights and Data Dissemination

Observations obtained by JWST on the basis of a peer-reviewed and selected proposal and observations associated with guaranteed time ([Policy 9](#)) shall have a default exclusive access period of one year after the data are made available in a form suitable for analysis. As has been the case with HST and Spitzer, programs may be assigned shorter exclusive access periods (often referred to as proprietary data periods). The specific duration of the exclusive access period for each class of observations will be defined in the Annual [Call for Proposals](#) issued by STScI and approved by the JWST Project Office. Normally, the exclusive access period will expire on a pointing by pointing basis.

The exclusive access period for any observation can be extended by the STScI Director, if dictated by compelling scientific requirements. Each such extension must be justified in detail to ensure the most productive and timely use of JWST data. During the exclusive access period, STScI staff may use data covered by this policy for operational and calibration purposes only.

The default exclusive access period may be reduced by the STScI Director with concurrence by NASA, ESA, and CSA.

After the assigned exclusive access periods, JWST data shall be made available to the general scientific community and the public. To obtain funding for JWST archival research, a requester must submit a proposal subject to peer review. However, nonrestricted JWST archive data can also be requested by scientists or the public without an attached request for analysis funding. Such requests must be honored without a peer review.

## Policy 3: Data Requests and Facilities

STScI shall provide astronomers in the US and international communities a means to retrieve modest amounts of JWST data from the archive at no cost to them. Furthermore, STScI will adopt the same practices and procedures for delivering data to Guaranteed Time Observers (GTOs), GOs and archive researchers regardless of whether they reside in U.S. or non-U.S. institutions.

STScI shall refer, with its recommendation, any U.S. requests for copies of significant portions of the JWST archives to the JWST Project who will refer it to the NASA Science Mission Directorate. It is expected that the full costs for providing such copies will be borne by the recipient. STScI will make its best effort to meet approved requests, on a non-interference basis, consistent with meeting its operational responsibilities.

STScI shall refer, with its recommendation, any non-U.S. requests for copies of significant portions of the JWST archives to the JWST Project who will refer it to the NASA Science Mission Directorate and the NASA HQ Office of External Relations through the normal JWST Project channel. It is expected that full costs for providing such copies will be borne by the recipient. The receiving institution or agency may be expected to provide distribution of these data to their local groups, and STScI may refer any such requests to the recipient.

Agreements will be negotiated on a case-by-case basis by the receiving institution or agency, the NASA HQ Office of External Relations, STScI, the JWST Project, and the JWST Program Office as appropriate. STScI will make its best effort to meet approved requests, on a non-interference basis, consistent with meeting its operational responsibilities.

## Policy 4: Post-Launch Commissioning of JWST

The JWST Project, supported by its contractors and by the European Space Agency (ESA) and Canadian Space Agency (CSA) JWST Projects, will conduct the overall, post-launch commissioning of the JWST and its ground systems. The commissioning activities are described in the JWST Observatory Commissioning Plan (JWST-PLAN-002040) and will include the deployment and checkout of observatory systems. The commissioning activities will verify JWST systems and optical performance and establish that basic scientific performance capabilities of the JWST Observatory are consistent with Program and Project requirements.

It is recognized that deployment, cool-down, orbital insertion and completion of commissioning will require approximately six months from launch. Some high priority scientific observations (GTO & GO) with the JWST are likely to be carried out during the commissioning period, since it is clearly desirable to begin to take science data as early as is technically feasible. The proper phasing of science observations with commissioning observations during this period is a scientific and operational decision to be negotiated by the Project and STScI within the framework of the commissioning plan. Reasonable latitude may be exercised in allowing a limited number of nonrestricted scientific and public information observations during the commissioning period, so long as this does not significantly disrupt the commissioning process.

Early Release Observations (EROs) will be taken by JWST during both the commissioning and post-commissioning phases of operation. These observations will be chosen to have wide public appeal and are designed to demonstrate the capabilities of the JWST instruments. Publication or reporting in any form of results of these observations is embargoed until the EROs are released. The ERO data become publicly available at that time.

The observing time for GO & GTO scientific observations carried out during the commissioning period will be charged to the Principal Investigators (PIs), and the data obtained will carry the normal exclusive access stipulations. Observing time allocated to commissioning observations defined in the Commissioning Plan will not be charged against either GTO or GO PIs. Disposition of the commissioning data and any nonrestricted scientific data shall be as follows. During the commissioning period, access to the data will be limited to the GTOs, STScI staff, NASA, ESA, CSA Project personnel, and others participating in commissioning activities. The only exceptions will be public information releases, governed by applicable NASA policies and applicable NASA-ESA-CSA agreements. At the conclusion of the commissioning period, after consultation with the STScI, with the Science Working Group (SWG), and with the other participating Agencies and contractors, the JWST Project will report on the state of readiness of the observatory in the JWST Observatory Commissioning Report. Subsequently, the results of commissioning will be reported by the JWST Project, the international partners, the SWG, and the STScI in a timely manner in a suitable public forum. The commissioning data will then be released for the use of observers and for later distribution in accordance with policies governing non-restricted JWST archive data. Data falling under the categories defined in Policy No. 6 shall be treated as commissioning calibration data until the conclusion of the commissioning period, at which time the provisions of Policy No. 6 shall take effect. Publication or reporting in any form of results obtained during the commissioning period is embargoed until the end of the commissioning period unless approved by NASA.



## Policy 5: Clarification of Extensions of Exclusive Access Data to Public Affairs Activities

Data from all approved investigations normally will not be released for public affairs purposes during the selected observers' period of exclusive access without the prior concurrence of both the selected observers and of appropriate NASA project and program personnel, as dictated by applicable NASA public affairs policy. Exclusive access data from approved ESA member state investigations, and all investigations utilizing the NIRSpec or MIRI, shall be governed by applicable NASA-ESA agreements (MOU, JPIP, etc.) dealing with data rights and public affairs. Exclusive access data from investigations by Canadian institutions and all investigations utilizing the FGS/TFI shall be governed by applicable NASA-CSA agreements dealing with data rights and public affairs. However, it is extremely important that selected observers be cognizant of the great public information potential of their JWST data, and that they work closely with the STScI public information office to meet the public's right to information without compromising the scientific goals of the program.

## Policy 6: Distribution of JWST Science Data Obtained from Investigations Other Than Those Selected Through the Peer-review Process

Circumstances under which JWST observations will be obtained outside of the normal investigation selection process are defined as follows:

1. Calibration Observations: Calibration observations of external targets and internal sources are required to maintain the accuracy and operational performance of the observatory. Calibration observations undertaken as part of the JWST calibration plan, whether primary or parallel, will not be entitled to any exclusive access period. Parallel observations are defined as those using a second scientific instrument when another is observing in a prime mode.
2. Director's Discretionary Observations: The STScI Director may assign up to 10% of the science program for scientific investigations received outside the normal solicitation and peer review process. These may include the study of unanticipated phenomena, high-risk programs, etc. Discretionary observations will generally have no exclusive access period. However, these programs may, at the Director's discretion, be made subject to the same exclusive access period described in [Policy 2](#).

## Policy 7: NASA Needs for Support for Other Missions

Under special circumstances, JWST observations of a particular target may be required to support another NASA program. All such requests must originate in the appropriate program office and require the approval of the AA/SMD after consultation with the STScI. Approved observations shall be given special priority by the STScI but will be scheduled to minimize the impact on other observing programs.

If such observations of a particular target have already been included within an approved observing program, the observations will be developed in coordination with both the observers and with the appropriate NASA program team. The data will be made available simultaneously for use by NASA and by the approved observers. Publication rights will be limited to the approved JWST observers. JWST time spent on such observations will count against the time awarded to the investigator and will carry the approved exclusive access period.

If the requested observations have not been included in any approved observing program, the observational data may be used initially only for the NASA program. After this exclusive use period, which should be as short as possible, the data will be placed in STScI archives for later distribution in accordance with policies governing non-restricted JWST archive data.

## Policy 8: Definition of Observing Time

On JWST, observing time will be defined to represent the total amount of mission-elapsed time, including [overheads](#), required to carry out an observation. As such, it will consist of the time that is spent pointing at a target position, as well as overheads associated with slewing to the target and any idle time necessary to carry out the observation. Where the overheads vary in length because they depend on the specific order in which a series of observations by various observers are carried out, average values for the activity will be used as defined in the Call for Proposals.

There will occasionally be observations that fail or are substantially compromised or incomplete for a variety of reasons. STScI will generally repeat or complete observations, assuming it is technically feasible to do so, in cases where a significant portion of the program has been compromised and the observer could not have reasonably anticipated the problem, or when the cause was not due to incomplete or incorrect information provided by the observer. Hence, GTOs and GOs will be charged only for observations that are considered to be successfully completed. The definition of a successfully completed observation will be considered on a case-by-case basis and will be the responsibility of STScI. This completion policy and its implementation will be the same for GTOs and GOs. Failed observations which are repeated will be allocated zero exclusive access time.

## Policy 9: Allocation of Guaranteed Observing Time to Scientists Selected Under AO 01-OSS-05 and Through NASA-ESA-CSA Agreements

The NIRCам PI and interdisciplinary scientists were guaranteed observing time (as defined in Policy 8) on the JWST in the AO **01-OSS-05**. The ESA NIRSpec team, European MIRI team and CSA FGS/TF PI were also guaranteed observing time through NASA-ESA-CSA agreements. This time will be utilized in total and by PI during the first thirty months following the commissioning phase. In addition, the following rules are to be applied by STScI when allocating GTO time:

- Cycle 1: the sum total of all GTO time must be less than or equal to 49%, but greater than or equal to 25% of the total available observing time for GTOs and GOs,
- Cycle 2: the sum total of all GTO time must be less than or equal to 33% of the total available observing time for GTOs and GOs,
- Cycle 3: the sum total of all GTO time must be less than or equal to 10% of the total available observing time for GTOs and GOs.

In cases where disputes arise in developing aggregate GTO times in any year that meet the above rules, the responsibility for resolution rests with the STScI Director and the NASA Program Scientist or their designees.

Delayed implementation of instrument modes may affect the ability of GTOs to complete their AO selected science program within the AO defined GTO period. Should such cases arise modest extension of the GTO period is possible in order to permit the program completion.

The following list indicates the amount of time per team:

- NIRCам PI: 900 hours total,
- NIRSpec Team: 900 hours total,
- U.S. MIRI Science Lead: 210 hours,
- U.S. MIRI Science Team members: 240 hours total,
- European MIRI Science Team: 450 hours total,
- FGS/TFI PI : 450 hours total,
- Each Interdisciplinary Scientist (IDS) (total 6): 110 hours each,
- U.S. Telescope Scientist: 210 hours total.

The NIRSpec and European MIRI teams' allocations will be submitted and managed by a designated point of contact, as follows:

- NIRSpec Team: the ESA Project Scientist
- European MIRI Science Team: the European MIRI team lead

## Policy 10: Redistribution of Guaranteed Observing Time Among Observers

The observing time allocation guaranteed under AO 01-OSS-05 and NASA-ESA-CSA agreements may be redistributed or combined internally among the selected PIs and scientists by mutual agreement of those affected and the concurrence of the STScI Director and NASA HQ. These concurrences are needed, since such redistribution may affect the planning and scheduling activities of the STScI. Observing time redistribution may not alter the total guaranteed time allocation nor the formula describing its overall distribution in the JWST AO (and thereby does not impact General Observers in any way).

# Policy 11: Protection of Science Programs Associated With Guaranteed Time

The individuals and teams defined in [Policy 9](#) are entitled to protection for their proposed observations so that they will, in fact, be able to obtain JWST data from such observations before General Observers obtain similar data on the same targets. With this goal in mind, STScI will require observing time proposals to be submitted by all holders of JWST guaranteed time. The scientific objectives of these proposals, for investigators selected through the AO process, must fall within the purview of the original response to the AO 01-OSS-05. Exceptions to this policy directive must be approved by NASA HQ.

Each person holding guaranteed time shall submit a proposal describing the set of scientific programs that will be executed during the 12 months after commissioning using the guaranteed time. These proposals, including a target list, identifying specific observations of specific targets, will be submitted to the STScI Director, no later than 7 months prior to the call for Cycle 1 GO Proposals; any modifications made with respect to prior proposals must be justified explicitly. Only scientific observations using specific instrumental configurations on specific targets for specific integration times will be protected. Duplication policies are defined in the [JWST Duplicate Observations Policy](#) and will be made available to JWST observers 5 months prior to each call for proposal. GTO programs for a particular cycle may only use instrumental modes available to GO observers in that cycle. There will be no protection rights for entire classes of objects, (e.g., quasars), nor for broad scientific programs (e.g., morphological classification of galaxies in all observable clusters of galaxies). GTOs may propose to use a portion of their time for "targets-of-opportunity," such as supernovae, novae, comets, etc. provided such a proposal is consistent with their original science goals, sufficiently specified that other similar phenomena may be pursued by GOs and compliant with the [duplication policy](#).

The specific details of proposal submission, content, and format will be developed by STScI. Conflicts between different GTOs, arising from requests for nearly identical observations on the same target, shall be resolved by the STScI Director. The Director shall notify the appropriate GTOs of such conflicts and encourage them to work out their own solutions. If this method fails, the STScI Director, shall apply the following priority system to resolve the conflict:

Priority 1 - GTOs utilizing their own instrument to pursue programs described explicitly in their original AO proposal to NASA for which they were granted guaranteed time or in the appropriate NASA-ESA-CSA agreements or in the ESA or CSA equivalent documents;

Priority 2 - IDSs and TS who pursue programs described explicitly in their original proposal;

Priority 3 - GTOs pursuing programs described explicitly in their original proposal that desire to use other JWST instruments than their own.

Although this priority structure should be employed in general, the STScI Director may seek advice concerning conflicts from the Telescope Allocation Committee (TAC).

The list of protected programs for the first science year must be finalized by a date to be determined by the STScI Director but no less than two months before the Call for Cycle 1 GO proposals, and will be circulated with the instructions to astronomers who wish to submit GO proposals. If the specific programs in this protected list have not been carried out within the first science year, they will be executed

in the following year unless they are specifically withdrawn prior to the solicitation for the following cycle. In the latter case, GOs may propose to make these observations. If the current cycle GTO programs are subsequently ruled to be duplicative of selected GO programs the affected GTOs will be permitted to change their program to remove the duplication.

Each GTO will submit plans for the second and third years in a similar fashion (e.g. in sufficient time that the information is available for the next round of GO selection). Details of the timing and other requirements for modified proposals will be developed by the STScI. These provisions apply to all NASA selected GTOs. NASA and ESA agree that the above provisions will apply to the ESA members of the NIRSpec Team established by ESA. NASA and CSA agree that the above provisions will apply to the CSA members of the FGS/TFI team established by CSA. NASA and the European MIRI PI agree that the above provisions will apply to the European MIRI team members.



## Policy 12: Education and Public Outreach

The STScI is the lead organization for education and public outreach (E/PO) for the JWST. Funding allocated to the STScI by NASA for matters related to E/PO shall be separately accounted and tracked.