



**STScI** | SPACE TELESCOPE  
SCIENCE INSTITUTE

**James Webb Space Telescope  
Director's Discretionary Early Release Science  
Call for Proposals Version 1  
6 January 2017**



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

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

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# JWST Director's Discretionary Early Release Science Call for Proposals

The policies governing the JWST Director's Discretionary Early Release Science (DD ERS) program in Cycle 1 are established in this Call for Proposals.

## Important Dates

Release of the DD ERS Call for Proposals (version 1; this document)	Friday Jan 6, 2017
Deadline to submit <a href="#">Notice of Intent (NoI)</a> to propose <i>Required. Only teams who submit NoIs will be allowed to submit full proposals.</i>	Friday Mar 3, 2017 8pm ET
Release of DD ERS Call for Proposals (final version)	Friday May 19, 2017
DD ERS Proposal Deadline	Friday Aug 18, 2017 8pm ET

## About this Document

This document establishes the goals, requirements, and policies for the JWST Director's Discretionary Early Release Science (DD ERS) program. It is intended to enable researchers to gauge whether they have sufficient interest in the program to submit a [Notice of Intent \(NoI\)](#) to propose. NoI submission is **required**; *only teams who submit NoIs will be permitted to submit a proposal.*

The final version of the Call for Proposals will be released in May 2017, and will provide additional details on the proposal and budget submission process along with supporting documentation. Instructions for using the Astronomer's Proposal Tool (APT) to specify observations will be made available. At that time documentation of special considerations for successful early execution of observations, and about STScI pipeline data products, processing and analysis software, and their anticipated availability, will also be provided. The latter should inform the design of [science-enabling products](#) to be developed and released by DD ERS [core teams](#), and the formulation of workplans, preliminary budgets, and schedules, which are [required elements of the proposal](#).

## Who's Responsible

Members of the Science Mission Office at STScI are responsible for the oversight of the JWST science program selection process. The members involved include Neill Reid (Associate Director for Science and Head of the Science Mission Office), Amaya Moro-Martin,

Louis-Gregory Strolger and Technical Manager Brett Blacker.

This document was prepared by Janice Lee and Neill Reid with input from many different individuals at STScI, from the JWST Project at Goddard Space Flight Center, and from the members of the JWST Advisory Committee (JSTAC).

## Where to Get Help

Submit questions to the JWST helpdesk at [jwsthelphelp.stsci.edu](http://jwsthelphelp.stsci.edu). Consult JWST documentation at [jwst-docs.stsci.edu](http://jwst-docs.stsci.edu), and see [jwst.stsci.edu](http://jwst.stsci.edu) for additional tools and resources.

## Related Links

[JWST DD ERS Notice of Intent Submission Form](#) (see instructions in the DD ERS CP)

[JWST General Science Policies](#)

[JWST GTO Call for Proposals](#)

# JWST DD ERS Notice of Intent to Propose

Each prospective team intending to submit a JWST DD ERS proposal must submit a Notice of Intent (NoI) to STScI by Friday Mar 3, 2017 8pm ET using the webform at <https://proper.stsci.edu/proper/noticeOfIntent>.

A MyST account is required to access the NoI webform and to submit. To create an account, to check whether you have an account, or to reset your password, go to <https://proper.stsci.edu/proper/password/forgot> and enter your e-mail address.

**NoI submission is a required step of the proposal process. Only teams who submit NoIs will be permitted to submit proposals,** and will receive alerts regarding JWST DD ERS program updates or amendments that may occur until the proposal submission deadline. In May 2017, STScI will issue detailed instructions on the proposal and budget submission process in the final version of the DD ERS Call for Proposals, as discussed on the [cover page](#) of this solicitation.

Submission of an NoI is required to help STScI to prepare for the proposal review. DD ERS NoI materials will be treated confidentially to the extent allowed by the proposal review preparation process.

The NoI requires the following information, **provided to the best of the proposing team's knowledge at the time of NoI submission:**

- a proposal title,
- the name, email address, and affiliation of the Principal Investigator (PI),
- the name(s), email address(es), and affiliation(s) of up to two [Co-Principal Investigators](#) (Co-PIs), if any,
- the name(s), email address(es), and affiliation(s) for as many of the [Co-Investigators](#) as are known at the time of NOI submission,
- the name(s), email address(es), and affiliation(s) for as many of the [Science Collaborators](#) as are known at the time of NOI submission,
- an overview of the anticipated proposal, not to exceed 300 words, describing:
  - the proposed types of JWST observations and science goals,
  - how the proposed project supports the [DD ERS goals and principles](#),

Proposal title, PI, any Co-PIs, and the proposal overview are entered directly into the webform. A single text file listing Co-Is and Science Collaborators is uploaded per the instructions on the webform page.

# JWST DD ERS Program Goals

The primary purpose of the Director's Discretionary Early Release Science (DD ERS) program is to educate and inform the community regarding JWST's capabilities, and provide rapid access to substantive, representative datasets to enable full scientific exploitation in Cycle 2 and beyond.

The rationale, goals, and organizing principles of the DD ERS program are described.

## Introduction

JWST has an expected lifetime of 10 years and a minimum lifetime of 5 years. With its 6.5m mirror and suite of four science instruments, JWST will provide imaging, spectroscopic and coronagraphic capabilities from 0.6 to 28.5 microns, offering an unprecedented combination of sensitivity and spatial resolution to study objects from the Solar System to the most distant galaxies. Realizing JWST's full science potential requires that the scientific community rapidly learn to use its sophisticated capabilities. To that end, STScI, in consultation with the [JWST Advisory Committee](#), has developed the Director's Discretionary Early Release Science (DD ERS) program.

## Goals and Principles

The overall goals of the DD ERS program are to:

- ensure open access to representative datasets in support of the preparation of Cycle 2 proposals, and
- engage a broad cross-section of the astronomical community in familiarizing themselves with JWST data and scientific capabilities.

These goals distinguish the DD ERS program from standard GO investigations. In service of these goals, DD ERS proposals are invited from the community.

The DD ERS program is guided by the following key principles:

- Projects must be substantive science demonstration programs that utilize key instrument modes to provide representative scientific datasets of broad interest to researchers in major astrophysical sub-disciplines.
- Projects must design, create, and deliver [science-enabling products](#) to help the community understand JWST's capabilities. An initial set of products must be delivered by the release of the Cycle 2 GO Call for Proposals (September 2019). Each project must define a [core team](#) to be responsible for the timely delivery of such products according to a proposed project management plan, with performance subject to periodic review.
- All observations must be schedulable within the first 5 months of Cycle 1 (expected to be from Apr-Aug 2019), and a substantive subset of the observations must be schedulable within the first three months. Target lists must be flexible to accommodate possible changes to the scheduled start of science observations.

- Both raw and pipeline-processed data will enter the public domain immediately after processing and validation at STScI; i.e. these data will have no proprietary time.
- STScI recognizes and supports the benefits of having diverse and inclusive scientific teams involved in the formulation of ERS proposals. Programs with diverse representation of community members in a given sub-discipline helps ensure that the investigations will be of broad interest. Broad involvement also facilitates the dissemination of JWST expertise through a more extensive network, and promotes more equitable participation in JWST scientific discovery.

The DD ERS program will be essential for informing the scientific and technical preparation of Cycle 2 General Observer (GO) proposals, submitted seven months after the end of commissioning.

# JWST DD ERS Proposal Policies

The goals of the JWST Director's Discretionary Early Release Science Program (DD ERS) are supported by policies that distinguish it from standard General Observer programs.

## Observing Time Available

The STScI Director will make up to 500 hours of discretionary time available for ERS, and resources are allocated to support up to 15 teams. Proposals will be chosen in research areas spanning the science themes of JWST: first light and reionization; the assembly of galaxies; the birth of stars and protoplanetary systems; and planets and the origin of life. Proposals will also be chosen to cover a range of key instrument modes and observing capabilities. A multi-disciplinary committee of experts will recommend a suite of proposals for observation and funding that both fulfills the [goals of the DD ERS](#) and makes optimal use of the available time.

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## Submission Eligibility

Scientists of any nationality or affiliation may submit and be included on JWST DD ERS proposals.

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## Proposer Types

Scientists included on DD ERS proposals must be designated as Principal Investigator, Co-Investigators or Science Collaborators.

- The **Principal Investigator** is responsible for leading the overall investigation and informing the community of the results. The PI has responsibility for the proper conduct of the research, including the appropriate use of funds (regardless of whether or not the PI receives support through the award) and administrative requirements such as the submission of scientific progress reports. Teams may identify up to two **Co-Principal Investigators** with appropriate justification, and clear specification of leadership roles and responsibilities in the proposed project management plan.
- **Co-Investigators**, together with the PI (and any Co-PIs) comprise the **core team**, which has the responsibility of developing and delivering [science-enabling products](#) as described in the proposal, as well as carrying out selected key aspects of the science investigations. A Co-I must have a well-defined, and generally sustained, continuing role in team activities, serve under the direction of the PI, and may or may not receive funding through the DD ERS program.
- **Science Collaborators** contribute to the formulation of the proposed observations and articulation of the full range of science applications enabled and may participate in core team activities, but do not have formal obligations to contribute to the

development and delivery of science-enabling products. Science collaborators are not funded through the DD ERS program but may propose for funding through the Cycle 1 Archival Research program (see section on Funding Support).

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## Funding Support

Subject to the availability of funds from NASA, STScI will provide financial support to eligible JWST DD ERS investigators for the primary purpose of development, production, and delivery of [science-enabling products](#). The base level requirements for DD ERS programs is that they provide deliverables that include quantitative, data-related measurements by the release of the Cycle 2 GO Call for Proposals (September 2019) and help maximize the science return from JWST. Proposers should request appropriate funding for those activities.

Proposers may apply for additional funding to develop value-added quantitative information or higher-level science products within one year of the completion of ERS observations so that those products are available by the release of the Cycle 3 Call for Proposals. Funding may also be requested to carry out selected aspects of the science investigations enabled by DD ERS observations.

Projects will be evaluated periodically to determine their suitability for continued funding.

Members of the science community, including science collaborators and investigators on accepted DD ERS proposals, may propose for funding through the Cycle 1 Archival Research program to pursue studies beyond science investigations funded directly through the DD ERS program. Information regarding the nature and scope of accepted DD ERS proposals will be provided with the Cycle 1 GO Call for Proposals.

It is anticipated that a total of up to \$5M will be available to support the activities of successful DD ERS teams. STScI's current plan is to award funding beginning October 2018 to allow DD ERS teams to organize their processing and analysis pipelines in preparation for the receipt of data beginning in about April 2019.

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## Funding Eligibility

STScI funding cannot be used in any way to support research efforts by non-U.S. investigators or institutions. Regardless of where they reside, an investigator who has a formal or contractual affiliation (*funded or unfunded*) with a non-U.S. institution is considered a "non-U.S. Investigator" and may not apply for funding.

Investigators must meet the eligibility requirements of a "U.S. investigator" by the budget submission deadline (expected to be in Nov-Dec 2017). Non-U.S. investigators who attain eligibility status after the budget deadline may not propose for funding to support their work on ERS projects.

"U.S. investigators" (including postdocs and graduate students) are defined as named PI's or Co-I's who are:

1. U.S. citizens residing in the United States, or abroad if salary is being paid only by a U.S. institution. (STScI funds are not intended to support U.S. investigators who live abroad full-time even if they do not receive a salary from a non-U.S. institution.

- Investigators in this status may not affiliate with a U.S. institution merely for the purpose of requesting STScI grant funds.), or
2. U.S. permanent residents and foreign national investigators working in the United States if salary is being paid only by a U.S. institution.
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## Moving Targets, Time Critical, and Coordinated Parallel Observations

DD ERS proposals may include observations of moving targets and time-critical observations.

DD ERS proposals may also include coordinated science parallel observations. Coordinated science parallel observations must have science goals that support or complement the prime science programs, and must be explicitly justified in the proposal. In Cycle 1 the following coordinated parallel modes will be supported:

1. NIRCам imaging and MIRI imaging,
2. NIRCам imaging and NIRISS Wide-Field Slitless Spectroscopy (WFSS),
3. NIRCам imaging and NIRISS imaging (NIRCам must be the prime instrument),
4. NIRCам 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 is allowed for NIRCам and MIRI observations in these coordinated parallel modes.

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## Ineligible Observations

Target of opportunity (ToO) and pure-parallel observations may not be proposed for the DD ERS program. The inherent uncertainty in scheduling such observations is inconsistent with the objective of the DD ERS program to provide the community open access to JWST science data early in Cycle 1. It should be noted that ToO observations are distinct from time critical observations (TCOs), which are allowed as part of the DD ERS program.

NIRSpec Micro-Shutter Assembly (MSA) observations requiring NIRCам pre-imaging are disallowed due to the estimated time needed for planning and scheduling between execution of pre-imaging and MSA observations (~2.5 months; [Beck et al. 2016](#)). NIRSpec MSA observations proposed for the DD ERS program must be based on existing source catalogs and imaging (e.g., [Ubeda et al. 2016](#)). Optimal results will be achieved with relative astrometric accuracy of 5-10 milli-arcseconds, which is comparable to standard HST imaging astrometric calibration accuracy.

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## Data Rights and Duplications

All observations taken as part of the DD ERS program will have no exclusive access period (i.e., a zero proprietary period). Both raw and

pipeline-processed data will enter the public domain immediately after processing and validation at STScI. DD ERS proposals will be reviewed, selected, and publicized prior to the Cycle 1 GO deadline. Archival Research proposals based on DD ERS data beginning in Cycle 1 will be permitted.

Observations taken as part of the DD ERS program cannot duplicate those specified in the Guaranteed Time Observer (GTO) Cycle 1 Reserved Observations Catalog unless there is a scientific justification for the additional observations. The GTO Cycle 1 Reserved Observations Catalog will be released no later than June 15, 2017. Likewise, proposed GO Cycle 1 observations cannot duplicate DD ERS observations. Generally, an observation is considered a duplication if it is on the same astronomical target or field, with the same instrument in the same/similar mode, with a similar spectral resolution and similar spectral range, and an on-target exposure time within a factor of 4 of the previously-scheduled observation. Any duplicate observations must be explicitly justified in the proposal. Further details are provided in the [JWST Duplication Policy](#).

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## Target Visibility and Alternate Targets

DD ERS teams must establish that the visibilities of their proposed observations will allow them to be obtained in the first 5 months of Cycle 1 (expected to be from Apr-Aug 2019), with a substantive subset observable within the first 3 months. DD ERS proposers must also describe the steps to be taken to identify alternate observations in the event of a change to the scheduled start of Cycle 1. Teams with accepted proposals will then be required to specify observations of a minimum set of alternate targets to allow the program to be executed at any point during the year. DD ERS alternate observation lists will be published, and GO Cycle 1 proposals including such observations will be allowed.

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## Proposal Confidentiality

DD ERS Nols and proposals submitted to STScI will be kept confidential to the extent allowed by the review process. For accepted proposals, the following information will become publicly accessible: names of PI, any Co-PIs, Co-Is, and science collaborators, project titles, abstracts, description of observations, special scheduling requirements, and details of all targets and exposures. APT files submitted for approved proposals become publicly accessible in their entirety.

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## References

Beck, T., Ubeda, L., Kassin, S., Gilbert, K., Karakla, D., Reid, I. N., Blair, W., Keyes, C., Soderblom, D., Peña-Guerrero, M. 2016, "Planning JWST NIRSpec MSA spectroscopy using NIRCcam pre-images," Proc. SPIE 9910, Observatory Operations: Strategies, Processes,

and Systems VI, 99101O (July 15, 2016); doi:10.1117/12.2232804

Ubeda, L. & Beck, T. 2016, "Planning your JWST/NIRSpec observation: pre-imaging and source catalogue," Proc. SPIE 9910, Observatory Operations: Strategies, Processes, and Systems VI, 991025 (July 18, 2016); doi:10.1117/12.2232867

# JWST DD ERS Project Updates and Status Reviews

Approved JWST Director's Discretionary Early Release Science (DD ERS) programs are required to provide project updates to the astronomy community and undergo status reviews by STScI.

## Project Updates for the Community

A prime goal of the DD ERS program is informing the astronomical community of JWST's scientific capabilities. DD ERS teams will contribute to this goal by sharing progress on their projects, with special focus on lessons learned on JWST observation planning strategies, data processing, and science analysis. **Webcasted briefings** given by DD ERS teams, will be organized by STScI as part of JWST community workshops. Prospective DD ERS teams should account for the effort required to support such briefings in the workplan and budget outlined in the submitted proposal. DD ERS teams should plan to support two major briefings in January and September 2019.

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## Status Reviews

To help ensure that the overall DD ERS program will achieve its stated goals, STScI will review the status of each project at key points. Where appropriate, review panels will include both STScI staff and external community members. The timing of the reviews will be such that materials prepared by the DD ERS teams for the reviews can be used to inform the broader community in January and September 2019. The reviews will assess the progress of each team relative to schedule milestones and delivery of [science-enabling products](#) as described in their workplans, identifying challenges that arise, together with potential solutions. Continued funding will be contingent upon satisfactory progress at each stage.

The nature of each review is as follows:

- **APT Technical Review:** Iterations between STScI staff and DD ERS teams to optimize programs will begin after the announcement of DD ERS review results in late October 2017. Teams will provide basic documentation describing the rationale underlying their observing strategies. That documentation will be released to the community with the final APT files in December 2017. This will enable DD ERS programs to serve as templates for planning of Cycle 1 GO proposals.
- **Readiness review:** Prior to the beginning of science observations, each team will report on their progress on preparatory activities and their readiness to process and analyze JWST data. Preparatory activities might include analyses of simulated datasets to test post-pipeline data processing plans (if proposed), and customization and/or development of data analysis and/or software tools (if proposed). This review will occur approximately three months prior to the beginning of science observations (three months after launch), and will support a community briefing in January 2019.

- **Results review:** Each team will report on the successes and challenges encountered based on the analysis of early data from their DD ERS project. The status of initial products that must be delivered by the release of the Cycle 2 GO Call for Proposals (September 2019) will be evaluated. This review will support a community briefing in September 2019.
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# JWST DD ERS Proposal Submission Requirements

JWST Director's Discretionary Early Release Science (DD ERS) proposals shall include a proposal narrative and detailed JWST observation specifications, including the requested time allocation, as described by the Astronomer's Proposal Tool (APT). JWST DD ERS proposals are due Friday Aug 18, 2017 8pm ET.

## JWST DD ERS Proposal Narrative

The proposal narrative must include sections that discuss the following topics. The page limit for the first four sections is 11 pages in total (including figures).

1. *Rationale for selection as a DD ERS program*: Explain how the proposal will support community preparations for Cycle 2 observations. Describe the anticipated interest in, and use of, the data and [science-enabling products](#) developed by the team. Describe how the proposal will serve as a pathfinder for science investigations.
2. *Science Justification*: Describe the scientific objectives supported by the proposed DD ERS observations and their overall importance to astronomy. Describe the selected aspects of the science to be directly funded by the DD ERS program. Discuss how the proposed observations support investigations beyond the immediate scientific objectives.
3. *Description of the Observations*: Describe the targets and observational modes to be used. Quantitative estimates must be provided of the accuracy required to achieve key science goals. Proposers must demonstrate that all observations can execute in the first 5 months of Cycle 1 (expected to be from Apr-Aug 2019), and that a substantive subset of the observations are accessible in the first 3 months. Qualitatively describe the availability of [alternate targets](#) and the process used to identify those targets should the start of science observations be delayed. Robust ERS programs involve science investigations that can be performed with a variety of different targets and observations.
4. *Data Processing & Analysis Plan*: Describe the data processing plan and identify science-enabling products that will be developed, including specifically those that will be made available by the release of the Cycle 2 Call for Proposals (September 2019). Describe the analysis required to pursue science investigations undertaken as an integral part of the DD ERS program.

**Science enabling products include**, but are not limited to, higher-level data products (improved beyond the standard products from the STScI pipeline), additional software tools, documentation and other resources that demonstrate JWST's scientific capabilities or facilitate community science. Deliverables must include quantitative, data-related measurements to support Cycle 2 proposal preparation. Science results by themselves are not science-enabling products. Proposers should take a broad, but realistic, view in determining the level and types of products to be developed given the relatively short timescales.

Proposals must present a delivery schedule for science-enabling products. A description of STScI pipeline data products,

processing and analysis software, and their anticipated availability, will be provided by the May 2017 release of the final version of this Call for Proposals. Proposers may consider multiple deliveries, with more advanced products provided over longer timescales. Proposals may include the collection, processing and analysis of ancillary data as part of an integrated DD ERS proposal.

5. ***Project Management Plan:*** Describe data processing and analysis plan, roles, responsibilities, work schedule, schedule and list of deliverables, including effort required to support [DD ERS community briefings](#). Identify the specific role of each co-Investigator. Proposers should assume an October 2018 start for the plan.
  
6. ***Preliminary Budget:*** A preliminary budget plan will be required with the science proposal. The plan will describe how funding will be allocated to support effective and timely delivery of an initial set of products to be provided by the release of the Cycle 2 GO Call for Proposals (September 2019); of any additional science-enabling products; and completion of selected science investigations. The plan will also include the type of labor expected for the project (i.e. postdocs, graduate students, senior salary). More detailed information regarding budget submission requirements will be provided in the final Call for Proposals to be released in May 2017.

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## JWST DD ERS Observation Specifications

Specifications for proposed DD ERS observations will be submitted in a manner consistent the JWST General Observer (GO) proposal process. Along with the proposal narrative, observational parameters must be specified using the Astronomer's Proposal Tool (APT) with enough information to enable them to be placed into a JWST Long Range Plan. STScI staff will provide [technical reviews of the observing specifications](#) for successful proposals, and assist with observing strategy optimization, if needed, in preparation for release of DD ERS APT files to the community.

Full instructions for JWST DD ERS proposal submission will be provided in May 2017, with the release of the final version of the DD ERS Call for proposals.

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# JWST DD ERS Proposal Evaluation

Proposals will be chosen in research areas spanning the science themes of JWST: first light and reionization; the assembly of galaxies; the birth of stars and protoplanetary systems; and planets and the origin of life. Proposals will also cover a range of key instrument modes and observing capabilities. A multi-disciplinary committee of experts will evaluate and recommend a suite of proposals for observation and funding that fulfills the [goals of the DD ERS](#) and makes optimal use of the available time.

The JWST DD ERS telescope allocation committee (TAC) will advise the STScI Director on the projects to be selected. DD ERS TAC members will be drawn from the US, European, and Canadian astronomical communities. The TAC will be multi-disciplinary, and proposals should be written for a non-specialist astronomical audience.

Evaluation will be based on the following criteria, assessing the potential to achieve the [goals of the DD ERS program](#):

- The extent to which the project will improve community understanding of JWST science capabilities and guide subsequent JWST observations
- The effectiveness in providing deliverables which include quantitative, data-related measurements that will support the development of Cycle 2 proposals
- The extent to which [science-enabling products](#) will be developed to enrich overall scientific return of the mission.
- The credibility of the management plan for achieving the project goals in a timely manner, particularly the development and delivery of science-enabling products for the community.
- The overall scientific merit of the program; its significance to major astrophysical sub-disciplines, and to astronomy in general.

All proposals must demonstrate that the unique capabilities of JWST are required to achieve the proposed science goals.

All proposals must be technically feasible. Proposals must demonstrate adequate opportunities for execution of observations [early in Cycle 1](#) and flexibility to accommodate possible changes to the start of Cycle 1 science observations.