

James Webb Space Telescope User Documentation

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“JDox”: modern, user-friendly documentation system
web-based, agile, searchable, integrated

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“JDox” goals

- user-friendly, accurate web-based JWST documentation
- “agile” process/infrastructure (easy to update)
- searchable via Google and internally
- heavily cross-linked across topics
- integrated with software tools (APT)
- ensure a happy and well-informed JWST community

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JDox philosophy: “Every Page is Page One”
similar to public transportation with “hubs” and “lines” but not linear





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“JDox” organization

JWST Opportunities and Policies - call for proposals, duplication, science parallel policies, funding/grants

JWST Observatory and Instrumentation - background articles, “instrument handbooks”

JWST Observation Planning – APT, ETC, observing constraints, observing strategies (e.g., moving targets, spectroscopy)

JWST Data – calibration, pipeline, data analysis, archive

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JDox Organization



JWST Observatory and Instrumentation

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- * Fine Guidance Sensor, FGS
- JWST Observatory
- Mid-Infrared Instrument, MIRI
- Near Infrared Camera, NIRCAM
- Near Infrared Imager and Slitless Spectrograph, NIRISS
- Near Infrared Spectrograph, NIRSpec



JWST Observation Planning

Expand all Collapse all

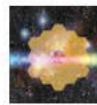
- JWST Proposing Tools
- JWST Proposal Planning
- JWST Observing Techniques



JWST Opportunities and Policies

Expand all Collapse all

- JWST Cycle 1 Proposal Opportunities
- JWST General Science Policies



JWST Data Calibration and Analysis

Expand all Collapse all

- * Information for Early Release Science (ERS)
Proposers about JWST Data
- JWST Data Reduction Pipeline
- * JWST Post-Pipeline Data Analysis
- JWST Calibration Programs and Data
- JWST File Names, Formats, and Data Structures
- Obtaining JWST Data

JWST Observatory and Instrumentation Documentation

Articles in this section, "JWST Observatory and Instrumentation," contain the types of content found in traditional instrument handbooks. The articles provide instrument-related information such as hardware descriptions, specifications, modes of operation, performance, and operational details. Also included are articles about the JWST telescope and spacecraft operations.

Other sections, selectable from the menu, are [JWST Observation Planning](#), [JWST Opportunities and Policies](#), and [JWST Data Calibration and Analysis](#).

While downloadable PDF files for this and the other sections will be generated for each cycle, the online content will be constantly updated with the latest information.

Observatory and instrumentation quick links

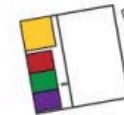
- › [Instruments](#)
- › [Imaging](#)
- › [Coronagraphy](#)
- › [Spectroscopy](#)
- › [Time series](#)
- › [Performance](#)
- › [Target acq](#)
- › [Dithering](#)
- › [Mosaics](#)



JWST Observatory

[Expand all](#) [Collapse all](#)

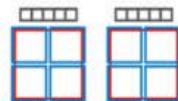
- › [JWST Observatory Overview](#)
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- › [JWST Momentum Management](#)
- › [JWST Integrated Science Instrument Module](#)
- › [JWST Data Rates and Data Volume](#)



MIRI Mid-Infrared Instrument

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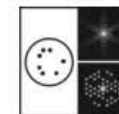
- › [MIRI Overview](#)
- › [MIRI Observing Modes](#)
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- › [MIRI Operations](#)
- › [MIRI Predicted Performance](#)



NIRCam Near Infrared Camera

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NIRISS Near Infrared Imager and Slitless Spectrograph

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summarizes
article in
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Instrument Handbooks

JWST Observatory and Instrumentation Documentation

Mid-Infrared Instrument, MIRI

MIRI summary

The JWST Mid-Infrared Instrument (MIRI) provides imaging and spectroscopic observing modes from 4.9 to 28.8 μm (Wright et al. 2015, Rieke et al. 2015). These wavelengths can be utilized for studies including, but not limited to: direct imaging of young warm exoplanets and spectroscopy of their atmospheres; identification and characterization of the first galaxies at redshifts $z > 7$; and analysis of warm dust and molecular gas in young stars and proto-planetary disks.

To achieve these goals MIRI offers a very broad range of observing **modes**, including:

- [imaging](#)
- [low-resolution slitted and slitless spectroscopy](#)
- [medium-resolution integral field unit \(IFU\) spectroscopy](#)
- [coronagraphy](#)

More about MIRI

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- [MIRI Observing Modes](#)
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MIRI

Mid-Infrared
Instrument

JWST Observatory and Instrumentation

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- [Mid-Infrared Instrument, MIRI](#)
- [Near Infrared Camera, NIRCAM](#)
- [Near Infrared Imager and Slitless Spectrograph, NIRISS](#)
- [Near Infrared Spectrograph, NIRSpec](#)

Recently Updated

- [NIRCam Wide Field Slitless Spectroscopy](#)

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JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Observing Modes

JWST's Mid-Infrared Instrument (MIRI) has four observing modes: [imaging](#), [coronagraphic imaging](#), [low-resolution spectroscopy](#), and [medium-resolution spectroscopy](#).

The JWST Mid-Infrared Instrument (MIRI) provides imaging and spectroscopic observing modes from 5 to 28.5 μm :

- [Imaging](#): A field of view of up to 74" \times 113" with filters ranging from 5.6 to 25.5 μm .
- [Low-resolution spectroscopy](#): slitted and slitless modes available from 5 to 12 μm . Slitless modes are currently only available for time series observations (TSOs).
- [Medium-resolution spectroscopy](#): integral field unit (IFU) spectroscopy available from 4.9 to 28.8 μm .
- [Coronagraphic imaging](#): 4 individual coronagraphs, one of which is based on the classic design of Lyot and 3 of which are based on 4-quadrant phase masks (4QPM).

Table 1. Properties of MIRI observing modes

• [Near infrared spectrograph, NIRSpec](#)

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• [NIRCam Wide Field Slitless Spectroscopy](#)

• [NIRCam Coronagraphic Modes](#)

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- [low-resolution slitted and slitless spectroscopy](#)
- [medium-resolution integral field unit \(IFU\) spectroscopy](#)
- [coronagraphy](#)

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JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Observing Modes

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JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Instrumentation

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The JWST [Mid-Infrared Instrument \(MIRI\)](#) contains optical, spectral, occulting and detector hardware components to support its [4 observing modes](#).

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-

Summary

-
-

The JWST [Mid-Infrared Instrument \(MIRI\)](#) provides [4 observing modes](#) from 5 to 28.5 μm . The major pieces of instrumentation hardware necessary to support these modes include:

- **Optics and focal plane:** the imager (MIRIM) and medium resolution spectrometer (MRS) are fed from a single pick-off mirror (POM).
- **Filters:** 10 filters for [imaging](#), 4 filter-diaphragm combinations for [coronagraphy](#), one neutral density filter, one ZnS-Ge double prism for the [LRS mode](#), one opaque position for darks, and one for a lens used during ground tests.
- **Coronagraph masks:** one occulter based on the classic [Lyot design](#) and 3 occulters that incorporate 4-quadrant phase masks (4QPMs).
- **Spectroscopic elements:** double prism for the [low resolution spectrometer](#) and 2 dichroic filter combination wheels for the [medium resolution spectrometer](#).
- **Detectors:** 3 impurity band conduction (Si:As IBC) devices.
- **Integral field units (IFUs):** 4 IFUs for the [medium resolution spectrometer](#).

Tabl

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◀ [MIRI Observing Modes](#)

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- [medium-resolution integral field unit \(IFU\) spectroscopy](#)
- [coronagraphy](#)

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JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Observing Modes

JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Instrumentation

JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Operations

The operational facts and features of JWST's MIRI define how its observatory-level capabilities can be applied for science.

The operational capabilities include:

- [MIRI Target Acquisition Overview](#)
- [MIRI Dithering Overview](#)
- [MIRI Mosaics Overview](#)
- [MIRI Parallel Observations](#)

- [Detectors](#): 3 impurity band conduction (Si:As IBC) devices.
- [Integral field units \(IFUs\)](#): 4 IFUs for the medium resolution spectrometer.

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- [imaging](#)
- [low-resolution slitted and slitless spectroscopy](#)
- [medium-resolution integral field unit \(IFU\) spectroscopy](#)
- [coronagraphy](#)

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JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Observing Modes

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MIRI Instrumentation

JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Operations

JWST Observatory and Instrumentation Documentation / Mid-Infrared Instrument, MIRI

MIRI Predicted Performance

The performance of JWST's [Mid-Infrared Instrument \(MIRI\)](#) is predicted by a model that uses a number of parameters derived from laboratory measurements.

The performance of MIRI has been studied in detail by [Glasse et al. \(2015\)](#) and [Boccaletti et al. \(2015\)](#). These studies bring together performance metrics from laboratory testing with a sensitivity model formulated by [Swinyard et al. \(2004\)](#). These models have been adapted by the [Exposure Time Calculator \(ETC\)](#). [Operational overheads](#) ([Gordon et al. 2014](#)), including target acquisition, small-angle maneuvers to allow efficient background subtraction, time spent moving MIRI mechanisms, or taking calibration observations are incorporated and included in the final time calculated by the [Astronomer's Proposal Tool \(APT\)](#).

Users should ultimately use the [ETC](#) for all sensitivity calculations.

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Planning Handbook

JWST Observation Planning Documentation / JWST Proposing Tools

JWST Exposure Time Calculator, ETC

JWST Exposure Time Calculator

The [JWST Exposure Time Calculator \(ETC\)](#) is a pixel-based ETC paired with a modern graphical user interface. It supports all JWST observing modes: imaging, spectroscopy (slitted, slitless, and IFU), coronagraphy, and aperture masking interferometry.

It has advanced features that go well beyond those in previous exposure time calculators; this includes algorithms that accurately model data acquisition and post-processing, as well as functionality for users to efficiently explore parameter space. The graphical user interface provides enhanced capabilities supporting multiple workflows. For example, users can create workbooks to manage related sets of calculations, can create complex astronomical scenes with multiple targets, and can compare the results of multiple calculations.



Recently Updated

[JWST Parallel Observing Strategies](#)

More about JWST ETC

[JWST Exposure Time Calculator Overview](#)
[JWST ETC Calculations Page Overview](#)
[JWST ETC Scenes and Sources Page Overview](#)
[JWST ETC Outputs Overview](#)
[JWST Backgrounds](#)
[JWST ETC Source Spectral Energy Distributions](#)

How to use JWST ETC

[JWST ETC Quick Start Guide](#)
[JWST ETC Creating a New Calculation](#)
[JWST ETC Defining a New Scene](#)
[JWST ETC Defining a New Source](#)
[JWST ETC Batch Expansions](#)
[JWST ETC Using the Sample Workbooks](#)
[JWST ETC Sharing Workbooks](#)
[JWST ETC User Supplied Spectra](#)

JWST Target Visibility Tools

Two standalone target visibility tools are available to help proposers evaluate the visibility of targets, and their allowed position angles on the sky, for potential observations by JWST instruments. Using these tools prior to developing a proposal in APT could save time and provide insight into observability.

Introduction

While the [Astronomers Proposal Tool \(APT\)](#) provides detailed schedulability information for each target, there may be instances where you'd want an overview of target visibilities and their [available position angle](#) ranges prior to entering them in your proposal in APT. For example, JWST pointing constraints may restrict position angles for targets near the ecliptic plane; in such a scenario, you may want to know upfront if observations at a particular position angle are feasible. (See the [Specifying JWST Positions Angles, Ranges, and Offsets](#) page for more information on this topic.)

The JWST project provides two quick-look target visibility tools to help in pre-planning observations, and for determining their feasibility, prior to entering them in APT: the [General Target Visibility Tool \(GTVT\)](#) predicts visibility windows and position angles for all instruments, and the [Coronagraphic Visibility Tool \(CVT\)](#) provides target visibility information for the NIRCcam and MIRI coronagraphic modes.

For given target coordinates, both tools report (1) the ecliptic latitude, and (2) the target visibility windows and allowed position angles versus time. These tools have been vetted for accuracy against APT calculations, but are primarily intended to provide an overview capability that complements APT.

JWST Observation Planning Documentation / JWST Proposing Tools

JWST Astronomers Proposal Tool, APT

JWST Astronomers Proposal Tool

The Astronomer's Proposal Tool (APT) is a GUI-based software package used to write, validate, and submit proposals for the James Webb Space Telescope (and the Hubble Space Telescope).

The JWST Astronomer's Proposal Tool is under development and subject to updates. Current documentation is based on APT v25.0.3, and may be revised with future APT releases.

This page provides quick access to articles on many aspects of APT. In turn, many of these articles link to more detailed descriptions or to instrument-specific information that will support proposers in understanding JWST and proposing for observation time.



APT

Astronomer's
Proposal Tool
v. 25.1

Recently Updated

- [JWST Observing Overheads and Time Accounting Overview](#)
- [Creating a NIRSpec Observing Program](#)
- [NIRSpec Bright Object Time Series Template APT Guide](#)
- [NIRSpec Fixed Slit Spectroscopy Template APT Guide](#)
- [NIRSpec Multi-Object Spectroscopy Template APT Guide](#)
- [NIRSpec MPT: Manual Planner](#)
- [NIRISS Aperture Masking Interferometry Template APT Guide](#)
- [NIRISS Single-Object Slitless Spectroscopy Template APT Guide](#)
- [NIRISS Wide Field Slitless Spectroscopy Template APT Guide](#)
- [NIRISS Imaging Template APT Guide](#)

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JWST Target Visibility Tools

On this page

- [Introduction](#)
- [The JWST General Target Visibility Tool \(GTVT\) for all instruments](#)
- [The JWST Coronagraphic Visibility Tool \(CVT\)](#)
- [Accessing the target visibility tools](#)
- [Synergy between the tools](#)
- [Related links](#)

JWST Observation Planning

- [JWST Proposing Tools](#)
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Call for Proposals

JWST Opportunities and Policies

Articles in this section, "JWST Opportunities and Policies," comprise the traditional call for proposals about the proposal submission process, along with articles about observing and science policies.

Other sections, that are selectable from the menu, are [JWST Observatory and Instrumentation Calibration and Analysis](#).

While downloadable PDF files for this and the other sections will be generated for each cycle, please check for the latest information.

JWST Cycle 1 Proposal Opportunities

[Expand all](#) [Collapse all](#)

- [Who's Responsible and Where to Get Help](#)
- [JWST Cycle 1 Guaranteed Time Observations Call for Proposals](#)
- [JWST Director's Discretionary Early Release Science Call for Proposals](#)

JWST General Science Policies

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- [JWST Observing Overheads and Time Accounting Policy](#)
- [JWST Duplicate Observations Policy](#)
- [JWST Science Parallel Observation Policies and Guidelines](#)
- [JWST Observing Program Modification Policy](#)
- [Policies for the Telescope Time Review Board](#)
- [JWST Target of Opportunity Program Activation](#)
- [NASA-SMD Policies and Guidelines for the Operations of JWST at STScI](#)

JWST Opportunities and Policies

JWST Cycle 1 Proposal Opportunities

Last Updated Sep 06, 2017

The James Webb Space Telescope will offer proposal opportunities for General Observers (GO), Guaranteed-Time Observers (GTO), and Early Release Science Programs (DD ERS) during Cycle 1. JWST Cycle 1 observations will commence in Spring 2019, with Cycle 1 proposals deadlines in 2017/2018.

We invite scientists to participate in the first cycle of investigations with the James Webb Space Telescope (JWST). JWST is an international collaboration between [NASA](#), the [European Space Agency \(ESA\)](#), and the [Canadian Space Agency \(CSA\)](#). JWST is operated and managed by AURA's [Space Telescope Science Institute \(STScI\)](#). The links below provide information, policies, deadlines, and instructions for proposing opportunities with JWST in Cycle 1.

- [Guaranteed Time Observation \(GTO\) Program \[PDF\]](#)
- [Director's Discretionary Early Release Science \(DD ERS\) Program](#)
 - [Call for Notices of Intent to propose](#)
 - [Call for Proposals \[PDF\]](#)
- [General Observer \(GO\) and Archival Research \(AR\) Program](#)

Important Dates

Rows are color coded by opportunity, where red = GTO, green = DD ERS, and white = Cycle 1 GO

Release of the Cycle 1 Call for GTO Proposals	January 6, 2017
Release of the Cycle 1 Call for DD ERS Notices of Intent	January 6, 2017
DD ERS Letters of Intent due	March 3, 2017, 8pm ET
Cycle 1 GTO Science Descriptions and Observation Specifications due	April 1, 2017, 8pm ET
Release of the Cycle 1 Call for DD ERS Proposals	May 19, 2017
APT version 25.1 Released (with updated Cycle 1 overhead calculations)	June 1, 2017

On this page

- [Important Dates](#)

JWST Opportunities and Policies

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Data Handbook

JWST Data Calibration and Analysis Documentation

JWST Data Reduction Pipeline

The JWST Data Reduction Pipeline is a Python software suite that automatically processes data taken by the JWST instruments NIRCam, NIRSpec, NIRISS, MIRI, and FGS to remove instrument signatures from the observations.

Introduction

The calibration pipeline processes data from all instruments and observing modes. It produces fully calibrated individual exposures and high level data products (mosaics, extracted spectra).

The calibration pipeline is organized in [stages by type of observations](#). The algorithms and structure of the pipeline are decided by [an inclusive working group](#).

The calibration pipeline is coded in Python. The details of how to [install the pipeline](#), [run the pipeline](#) including [tutorials](#), and the [detailed code documentation](#) including the [data structures used](#) are provided.

JWST Data Calibration and Analysis Documentation

JWST Post-Pipeline Data Analysis

This article provides an overview of JWST post-pipeline data analysis tools and contains pointers to software installation and training materials.

Introduction

JWST Post-pipeline data-analysis tools are distributed as part of [AstroConda](#) to assist observers in viewing and analyzing their JWST data. The tools are generally written in Python and work together with [Astropy](#). Development is ongoing. All software is open source and community contributions are welcome in the form of suggestions, bug reports, or actual code.

The suite of post-pipeline data-analysis tools is intended to help astronomers with the often iterative and interactive workflow involved in converting these pipeline data products into meaningful scientific results. This involves tasks such as:

- inspecting data and data-quality information;
- masking or flagging data and using those annotations to guide later steps in the analysis;
- using the results of interactive analysis to guide a custom run of the pipeline (e.g. tweaking spectral extraction parameters or background estimates);
- combining data sets in various ways, with careful attention to astrometry, PSF matching, and other issues;
- source detection and photometry using different choices or algorithms than those used in the pipeline;
- measuring lines and continuum in spectral data; and
- fitting models to data or otherwise testing hypotheses.

A typical workflow involves highly interactive exploratory analysis on small portions of the data, followed by development of custom scripts to automate the analysis on larger data sets.

JDOx Quick Start Instructions

The screenshot shows the 'MIRI Imaging' page with several key features highlighted by colored boxes and arrows:

- Navigation Bar:** A red box highlights the top navigation menu with links for HOME, INSTRUMENTS, PLANNING, CALL FOR PROPOSALS, POLICIES, and DATA.
- Search Bar:** A green box highlights the search input field in the top right corner.
- Inline HTML Links:** A grey box highlights a link within the main text body.
- Current Page Outline:** A blue box highlights the 'On this page' sidebar menu.
- Current Space Page Tree:** A pink box highlights the 'JWST Observatory and Instrumentation' sidebar menu.
- Recent Page Updates:** A yellow box highlights the 'Last updated' section at the bottom right.
- Related Links, References at bottom of page:** A white box with two downward-pointing arrows is located at the bottom left of the page content.

The page content includes a breadcrumb trail, a title, a descriptive paragraph, an introduction, a 'Basic performance' section, and a figure showing the MIRI imaging field of view.

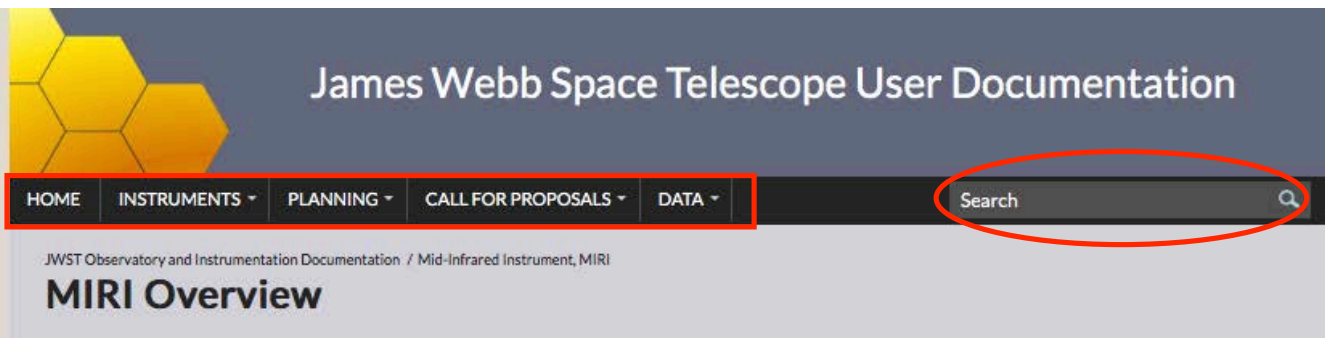
A diagram on how to quickly find your way around a sample JDOX article.

JDoc site navigation

summary
(appears in Google)

links to other pages

figures
(click to enlarge)



search bar

The JWST Mid-Infrared Instrument (MIRI) provides imaging and spectroscopic observing modes from 4.9 to 28.8 μm .



Introduction

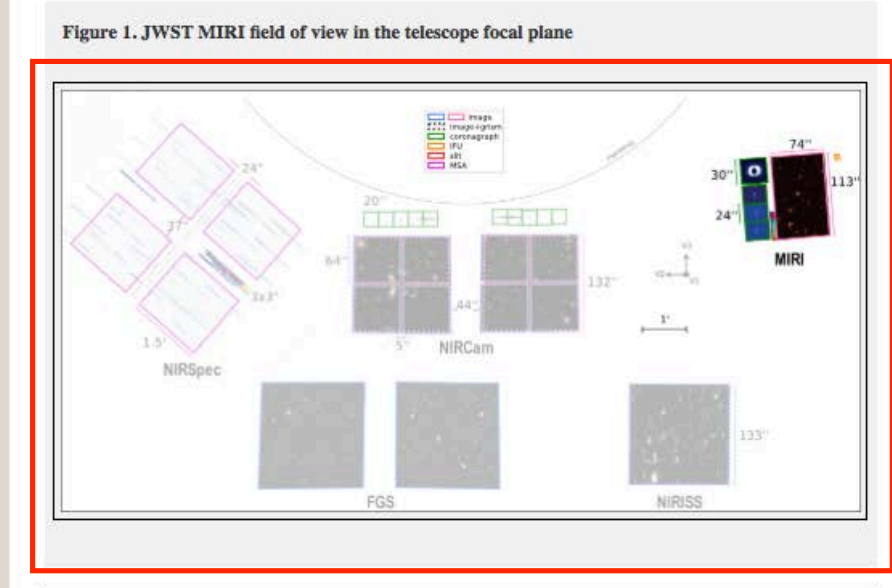
The JWST Mid-Infrared Instrument (MIRI) provides imaging and spectroscopic observing modes from 4.9 to 28.8 μm (Wright et al. 2015, Rieke et al. 2015). These wavelengths can be utilized for studies including, but not limited to: direct imaging of young warm exoplanets and spectroscopy of their atmospheres; identification and characterization of the first galaxies at redshifts $z > 7$; and analysis of warm dust and molecular gas in young stars and proto-planetary disks.

To achieve these goals MIRI offers a very broad range of observing modes, including:

- imaging
- low-resolution slitted and slitless spectroscopy
- medium-resolution integral field unit (IFU) spectroscopy
- coronagraphy

- ### On this page
- Introduction
 - Observational capabilities
 - Optical elements
 - Imager
 - Medium-resolution spectrometer (MRS)
 - Sensitivity and performance
 - Data calibration and analysis
 - Acknowledgements
 - Related links
 - References

page contents



- ### JWST Observatory and Instrumentation
- Fine Guidance Sensor, FGS
 - JWST Observatory
 - Mid-Infrared Instrument, MIRI
 - MIRI Overview
 - MIRI Observing Modes
 - MIRI Instrumentation
 - MIRI Operations
 - MIRI Predicted Performance
 - Near Infrared Camera, NIRCAM
 - Near Infrared Imager and Slitless Spectrograph, NIRISS
 - Near Infrared Spectrograph, NIRSpec

links to other pages
(page tree)



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JWST Observatory and Instrumentation

background articles on telescope & instrumentation

MIRI

- "Landing Page" (hub with little content)
- Overview
- Observing Modes (Imaging, Coronagraphy, LRS, MRS)
- Instrumentation/Hardware (Optics/Focal Plane, Detectors, Filters, etc)
- Operations (Dithers, Target Acq, Mosaics)
- Predicted Performance (Bright Source Limits, Sensitivity)

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Access JDOx via *Context Sensitive Help* in APT

The screenshot displays the Astronomer's Proposal Tools (APT) interface, version 25.2.1, for a JWST Draft Proposal (Unsaved). The main window is titled "Observation 1 of JWST Draft Proposal (Unsaved)".

The interface includes a toolbar with various tools like Form Editor, Spreadsheet Editor, Orbit Planner, Visit Planner, View in Aladin, BOT, Target Confirmation, PDF Preview, Submission, Errors and Warnings, Run All Tools, and Stop. A sidebar on the left shows a tree view of the proposal structure, including Proposal Information, Targets, Observations, Observation Folder, Observation 1, and Observation Links.

The main configuration area for "Observation 1" includes the following fields and controls:

- Number: 1, Status: UNKNOWN
- Label: (empty text field)
- Instrument: MIRI (dropdown menu)
- Template: MIRI Imaging (dropdown menu)
- Coordinated Parallel: (checkbox)
- Target: None Selected (dropdown menu)
- Visit Splitting: 5.0 Arcsec (text field), Number of Visits: 1 (text field)
- Duration (secs): 0 (text field), Total Charged: 2474 (text field)
- Data volume: 0 MB

Below the configuration area, there are tabs for "MIRI Imaging" (selected), "Mosaic Properties", "Special Requirements", and "Comments".

The "Subarray" section shows "None Selected" (dropdown menu).

The "Dithers" section contains a table with columns: #, Dither Type, Starting Point, Number of ... Points, Starting Set, Number of ... Optimized ..., Direction, and Pattern Size. Below the table are buttons for "Add", "Duplicate", "Insert Above", and "Remove".

At the bottom, there is another table with columns: #, Filter, Readout Pat..., Groups/Int, Integration..., Exposures..., Dither, Total Dithers, Total Integr..., and Total Expo... Below this table are buttons for "Edit Observation Folder", "New", and "Edit Observation Links".

APT (25.1 and greater): blue text represents context sensitive links

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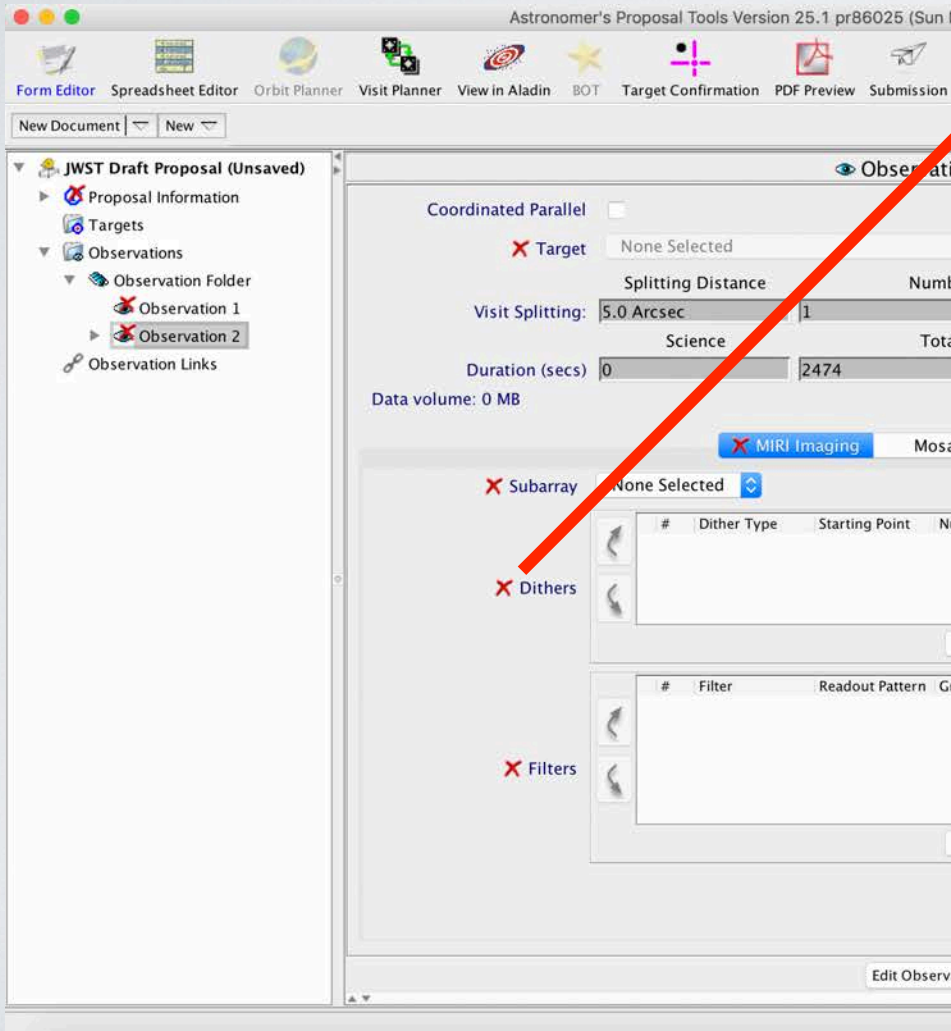
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The **DITHERS** dialog box handles the creation of **dither patterns**, which must be created before defining your imaging sequence. Each **DITHER** is specified by setting several parameters: **DITHER TYPE**, **STARTING POINT**, **NUMBER OF POINTS**, and **PATTERN SIZE**.

Note that the smallest subarrays are smaller than the largest dithers, so the choice of dither pattern may be constrained by the choice of subarray. The MIRI imaging template in APT will only display dither parameters that are valid for the selected subarray.

MIRI imaging supports the following types of large-scale dither patterns:

Dither type	Use case	Number of dithers
CYCLING	Shallow, flexible imaging, optimized for self-calibration	3-311
REULEAUX	Deep imaging, optimized for self-calibration	12
2-Point	Fast nod, for snapshots	2
4-Point-Sets	Flexible dithers for user-optimized imaging of extended sources	Multiple of 4

(Small-scale dithers are supported for imaging with F560W and F770W. To minimize overheads, small dithers are implemented using the telescope fine steering mirror (FSM). After slewing the telescope to each large dither, the small dither pattern will be executed in sequence, leading to a total of

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MIRI Overview

The JWST Mid-Infrared Instrument (MIRI) provides imaging and spectroscopic observing modes from 4.9 to 28.8 μm .

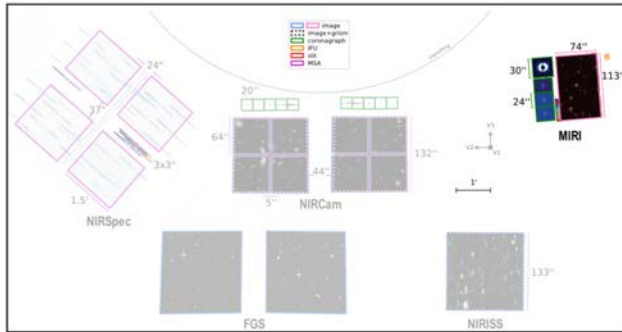
Introduction

The JWST Mid-Infrared Instrument (MIRI) provides imaging and spectroscopic observing modes from 4.9 to 28.8 μm (Wright et al. 2015, Rieke et al. 2015). These wavelengths can be utilized for studies including, but not limited to: direct imaging of young warm exoplanets and spectroscopy of their atmospheres; identification and characterization of the first galaxies at redshifts $z > 7$; and analysis of warm dust and molecular gas in young stars and proto-planetary disks.

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- imaging
- low-resolution slitted and slitless spectroscopy
- medium-resolution integral field unit (IFU) spectroscopy
- coronagraphy

Figure 1. JWST MIRI field of view in the telescope focal plane



Observational capabilities

MIRI offers 4 different observing modes, including (1) imaging with 9 photometric bands, (2) coronagraphic imaging with 4 different filters, (3) low-resolution spectroscopy with a slit or slitless configuration, and (4) medium-resolution spectroscopy with 4 different IFUs. Each mode has its own template in the Astronomer's Proposal Tool (APT).

Table 1. Properties of MIRI observing modes

Observing mode	Wavelength coverage (μm)	Field of view or slit size (arcsec)	Pixel scale ($''/\text{pixel}$)	Resolving power $R = \lambda / \Delta\lambda$	PIVIS	Comment
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PDFs will also be available

generated periodically for subsets of documentation (“instrument handbook”, “Cycle I Call for Proposals”)

(may be slightly out of date)

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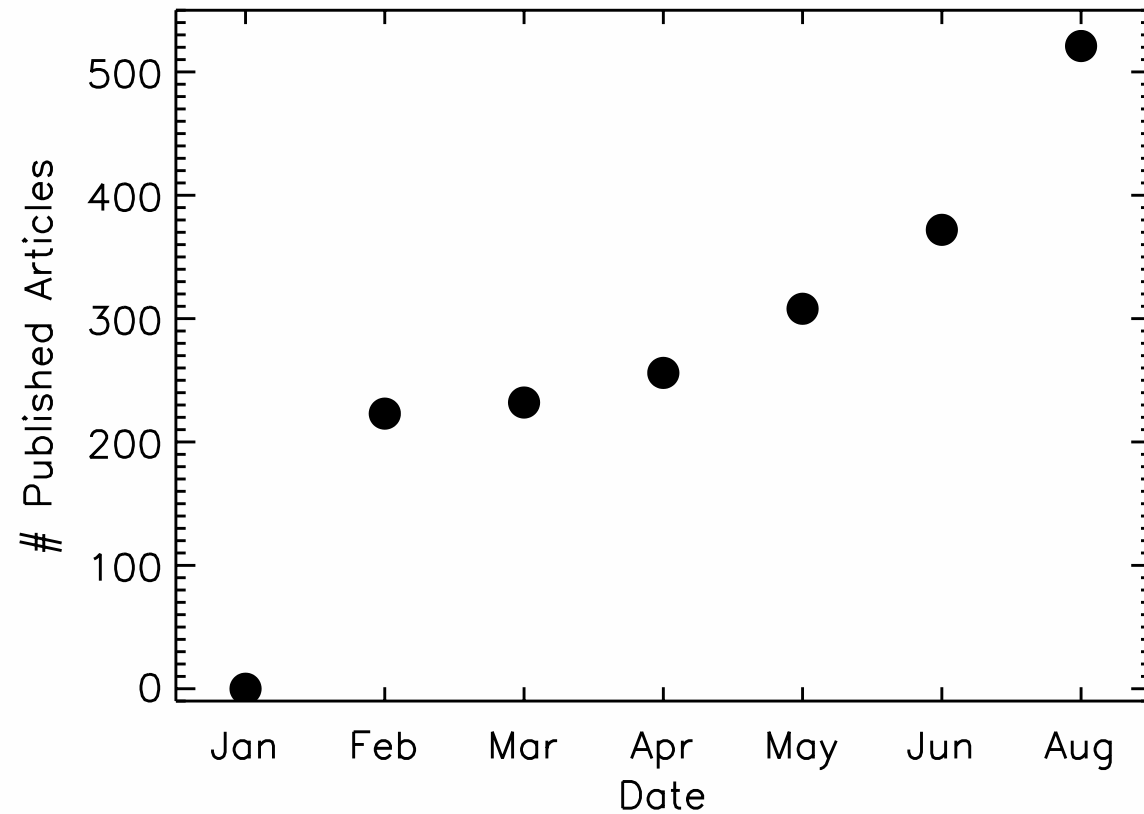
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jwst-docs.stsci.edu is live





JWST Observatory and Instrumentation

Expand all Collapse all

- Fine Guidance Sensor, FGS
- JWST Observatory
- Mid-Infrared Instrument, MIRI
- Near Infrared Camera, NIRCAM
- Near Infrared Imager and Slitless Spectrograph, NIRISS
- Near Infrared Spectrograph, NIRSpec



JWST Observation Planning

Expand all Collapse all

- JWST Proposing Tools
- JWST Proposal Planning
- JWST Observing Techniques

521 articles published

more in pipeline for
GO CfP



JWST Opportunities and Policies

Expand all Collapse all

- JWST Cycle 1 Proposal Opportunities
- JWST General Science Policies



JWST Data Calibration and Analysis

Expand all Collapse all

- Information for Early Release Science (ERS) Proposers about JWST Data
- JWST Data Reduction Pipeline
- JWST Post-Pipeline Data Analysis
- JWST Calibration Programs and Data
- JWST File Names, Formats, and Data Structures
- Obtaining JWST Data



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Information planned to be released before GO CFP

- Baseline Cycle I calibration program
- Observing Techniques (slitless spectroscopy, time series observations, moving targets)
- Science Use Cases (walk user through instrument specific considerations, ETC simulations, setting up proposal in APT)
- Instrument Best Practices
- Additional Video Help (ETC, APT/Aladin)

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Progress: jwst-docs.stsci.edu is live! (521 articles published)

Published:

- ✓ GTO Call for Proposals
- ✓ DD-ERS Call for Proposals
- ✓ ETC
- ✓ APT
- ✓ Target Visibility Tools
- ✓ Context Sensitive Help

Timeline

Aug 2017: Cycle 1 DD-ERS proposal deadline

Nov 2017: Cycle 1 GO Call for Proposals and supporting articles

Mar 2018: Cycle 1 GO proposal deadline

Apr 2018 – : frequent JDOx updates through launch / commissioning / Cycle 1

Preliminary publications (subject to revisions and additions):

- ✓ Instrument Handbooks
- ✓ Data Handbooks

Coming later this year:

- Science use cases
- Observing Modes and Strategies
- more APT & ETC instructional videos

comments / feedback?
JWST help desk user forum:
jwsthlp.stsci.edu