



STScI | SPACE TELESCOPE
SCIENCE INSTITUTE

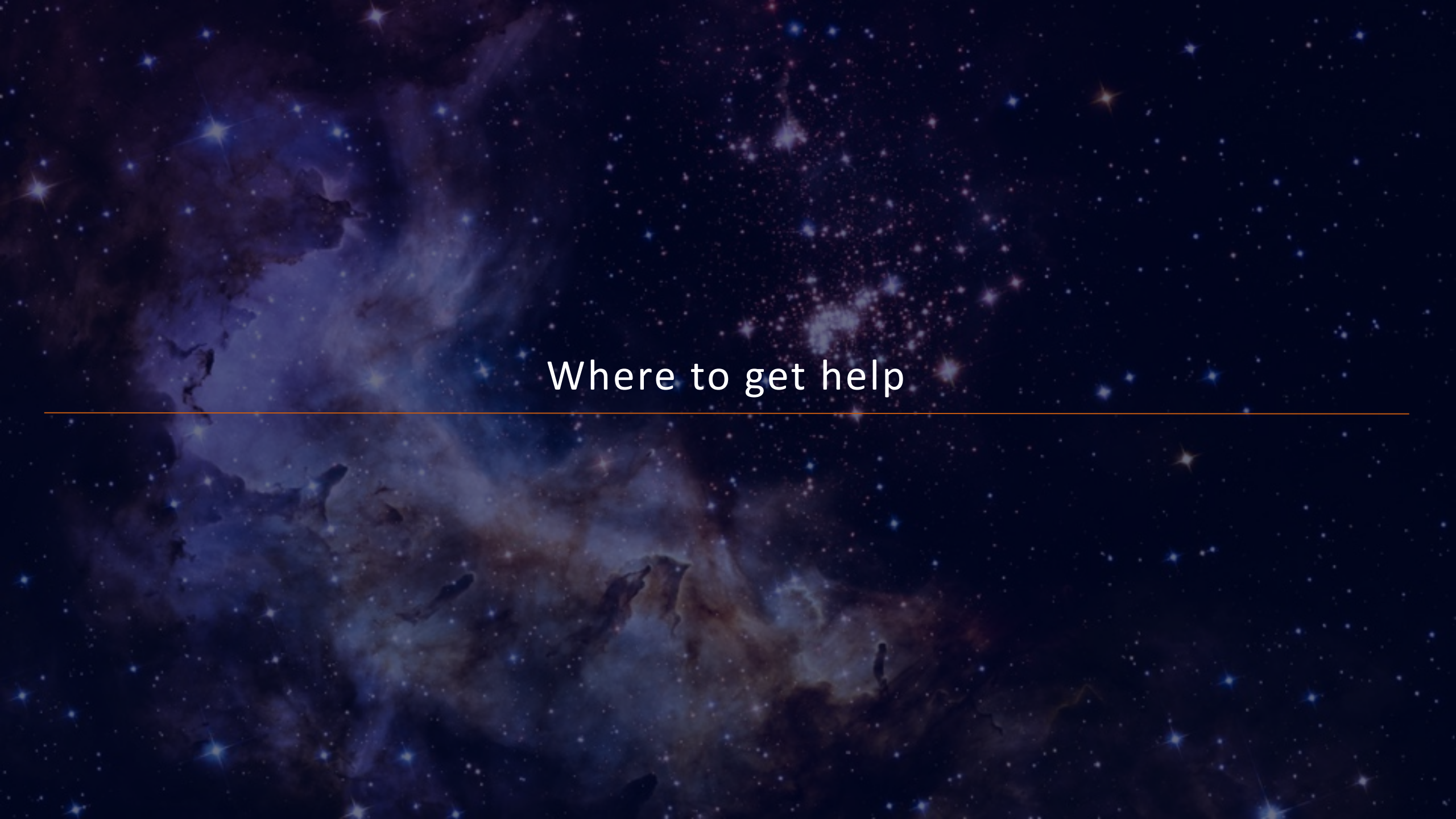
EXPANDING THE FRONTIERS OF SPACE ASTRONOMY

Moving Targets Level 2

Blair Porterfield, Weston Eck, John Stansberry, and Bryan Holler

JWST Master Class

November 2019



Where to get help



Where to go for help

JWST Documentation on Moving Targets (JDox)

Can be found at [JWST Moving Target Observations](#)

Context Sensitive Help in the APT

Hovering the cursor over the parameters in the form editor will display a question mark.
When clicked on it will bring up the relevant section of JDox.

Context Sensitive Help in the ETC

Blue question mark icons are present throughout the web application.
When clicked they will bring up the relevant section of JDox.

JWST Help Desk

Can be found at <https://stsci.service-now.com/jwst>

Requires a MyST account to submit questions (as does submitting a proposal)

Can search the knowledge database without an account



Where to go for help

STScI | JWST Help Desk

Knowledge Service Portals My Open Tickets 3 BP Blair Porterfield

Home > Service Catalog > James Webb Help Desk

Search

View Details

MIRI Support
Request assistance with the Mid-Infrared Instrument (MIRI)

View Details

NIRCam Support
Request assistance with the Near-Infrared Camera (NIRCam)

View Details

NIRISS Support
Request assistance with the Near-Infrared Imager and Slitless Spectrograph (NIRISS)

View Details

NIRSpec Support
Request assistance with the Near-Infrared Spectrograph (NIRSpec)

View Details

Office of Public Outreach
Contact the STScI Office of Public Outreach about JWST

View Details

Pipeline Support
Request assistance with the JWST pipeline

View Details

Solar System Observing
Ask questions about proposal writing for solar system targets with JWST

View Details

Time-Series Observations
Request assistance making time-series observations (e.g., transiting exoplanets)

View Details

WebbPSF / JWST Telescope
Request assistance with the WebbPSF tool or the Telescope optical system

View Details

JWST General Support
Request general JWST support for issues not covered by another category

View Details

MAST Archive Support
Request general Archive support for issues not covered by another category

View Details

Card specifically for moving targets

The background of the slide is a deep blue and purple starry sky. A large, diffuse nebula with wispy, ethereal structures is visible, primarily on the left and bottom-left sides. The rest of the sky is filled with numerous stars of varying brightness and colors, including some bright blue stars. A thin, horizontal orange line runs across the middle of the slide, positioned just below the main text.

Moving Target Visibility Tool (MTVT)



MTVT: Background

The MTVT is a command line tool used to determine the time periods when a target of interest is in the JWST field of regard (FOR). It is a wrapper to the General Target Visibility Tool (GTVT).

The MTVT was originally developed by Mike Kelley. Mees Fix is responsible for ongoing development and maintenance of the tool.



MTVT: Installation

- The MTVT comes as part of a package with the General Target Visibility Tool (GTVT)

Installation and usage

One can download a .zip file or clone the repository for GTVT from the following GitHub link:

```
https://github.com/spacetelescope/jwst\_gtvv
```

and install the tool inside the resulting "jwst_gtvv-master" directory (you should see a file called "setup.py" in this directory) with the command

```
python setup.py install
```

Alternatively, if you are familiar with "pip", you can install the tool directly with

```
pip install git+https://github.com/spacetelescope/jwst_gtvv.git
```

- Python package dependency: *astroquery*

```
conda install astroquery
```

Alternatively, if you are familiar with "pip", you can install the package with the following command:

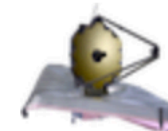
```
pip install astroquery
```




MTVT: Documentation

[Home](#) / [Other Tools](#) / [Target Visibility Tools](#) / [JWST General Target Visibility Tool Help](#)

JWST General Target Visibility Tool Help

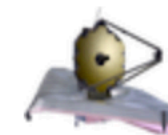


The JWST General Target Visibility Tool (GTVT) is a command-line Python tool that provides quick-look assessments of target visibilities and position angles for all JWST instruments.

[General Target Visibility Tool Help](#)

[Home](#) / [Other Tools](#) / [Target Visibility Tools](#) / [JWST Moving Target Visibility Tool Help](#)

JWST Moving Target Visibility Tool Help



The JWST Moving Target Visibility Tool (MTVT) is a command-line Python tool that provides quick-look assessments of moving target visibilities and position angles for all JWST instruments.

[Moving Target Visibility Tool Help](#)



MTVT: Usage

```

jwst_mtvv [-h] [--smallbody] [--v3pa V3PA] [--save_plot SAVE_PLOT]
          [--save_table SAVE_TABLE] [--instrument INSTRUMENT]
          [--name NAME] [--start_date START_DATE] [--end_date END_DATE]
          desg [desg ...]
  
```

Only required argument: Target name or number

Each time you run the program, it will generate a plot with the background image taken from the JWST archive. The plot will be saved in the current directory in JPEG format.



MTVT: Demonstration

- Visibility of a planet
- Visibility of a satellite
- Visibility of an asteroid/NEA/Trojan/Centaur/KBO
- Visibility of a comet
- Visibility of an interstellar object



Moving Target Visibility Tool (MTVT): On-line Resources

JDox:

- JWST Field of Regard: [JWST Observatory Coordinate System and Field of Regard](#)
- JWST Orbit: [JWST Orbit](#)
- GTVT: [General Target Visibility Tool Help](#)
- MTVT: [Moving Target Visibility Tool Help](#)

Other links:

- JPL/Horizons: <https://ssd.jpl.nasa.gov/horizons.cgi>
- Astroconda: <https://astroconda.readthedocs.io/en/latest/>
- Astroquery: <https://astroquery.readthedocs.io/en/latest/>



Exposure Time Calculator (ETC)



ETC: Moving Targets in the ETC

There are currently no unique features for moving targets in the JWST ETC.



ETC: Useful Features for Moving Targets

Example Science Program and Sample Workbook

[Create New Workbook](#)
[Sample Workbooks](#)
[Example Science Program Workbooks](#)

Select a Workbook

User ▾

- MIRI Target Acquisition Examples
- NIRCam Target Acquisition Examples
- NIRISS AMI Examples
- NIRISS Target Acquisition Examples
- NIRSpec Target Acquisition Examples
- Slitless Spectroscopy Examples
- Slitted Spectroscopy (including NIRSpec MOS)
- Solar System Sample Workbook

Grant

[Create New Workbook](#)
[Sample Workbooks](#)
[Example Science Program Workbooks](#)

Select a Workbook ?

User ▾

- #22 NIRCam Deep Field Imaging with MIRI Imaging Parallels
- #23: NIRISS AMI Observations of Extrasolar Planets Around a Host Star
- #26: MIRI MRS and NIRSpec IFU Observations of Cassiopeia A
- #28: MIRI MRS Spectroscopy of a Late M Star
- #31: NIRISS SOSS Time-Series Observations of HAT-P-1
- #33: NIRISS WFSS and NIRCam Imaging of Galaxies Within Lensing Clusters
- #34: NIRSpec IFU and Fixed Slit Observations of Near-Earth Asteroids

Home / Near Infrared Spectrograph / NIRSpec Example Programs / NIRSpec IFU and Fixed Slit Observations of Near-Earth Asteroids

NIRSpec IFU and Fixed Slit Observations of Near-Earth Asteroids

Example Science Program #34

This example science program presents an application of the [Moving Target Roadmap](#), using NIRSpec IFU observations of Near-Earth Asteroids as an example. This article covers selection of fast moving targets and appropriate observing modes based on the targets' positional uncertainties. Proper determination of exposure parameters in the ETC and construction of an APT file are covered in separate linked articles.

<https://jwst-docs.stsci.edu/near-infrared-spectrograph/nirspec-example-programs/nirspec-ifu-and-fixed-slit-observations-of-near-earth-asteroids>



ETC: Useful Features for Moving Targets

Power-law flux distribution

Source Editor ⓘ

ID Continuum Renorm Lines **Shape** Offset

Flat 2D Gaussian Sersic (Effective Radius) Sersic (Scale Radius) **✓ Power Law**

Normalization choices

per Square arcsec

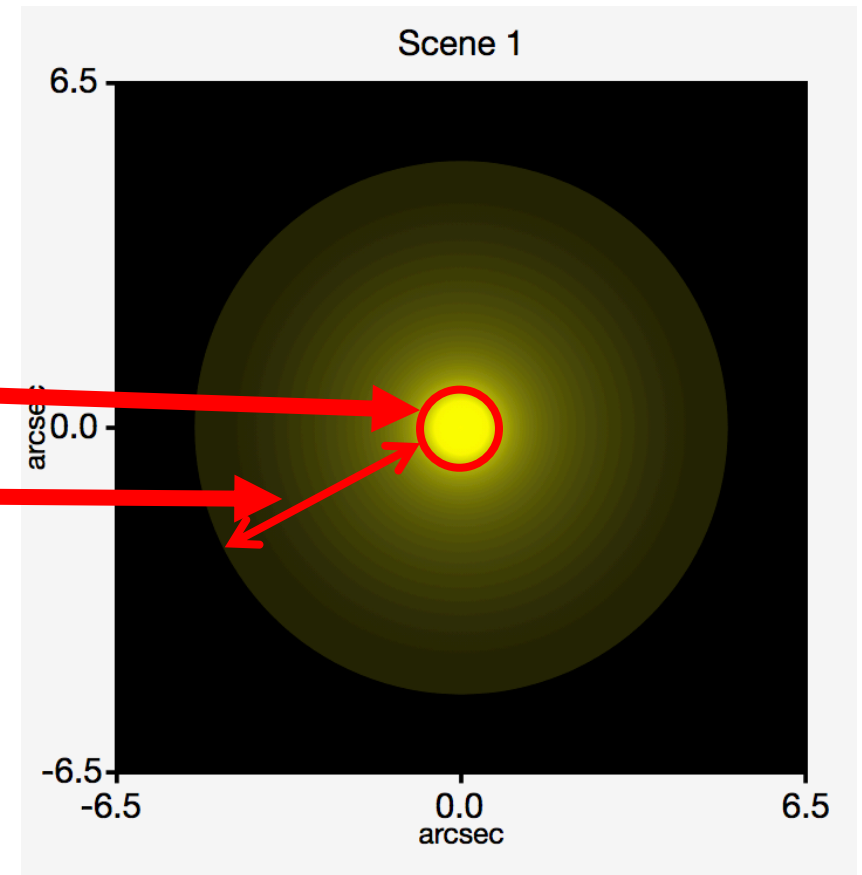
Source selected: 1

Reset Save

Parameters

Core Radius 0.005 arcsec

Power Law index 2.0



(Spherical shape only)



ETC: Useful Features for Moving Targets

Template spectra: G2V Phoenix stellar model & Blackbody

Source Editor ?

ID
 Continuum
 Renorm
 Lines
 Shape
 Offset

Spectral Energy Distribution

Uploaded File
 Select

Analytic Spectra

- Flat Continuum
- Power-law Continuum
- Blackbody Spectrum

 Stellar Spectra

- Phoenix Stellar Models
- HST Standard Stars

 Extragalactic Spectra

- Galaxy Spectra from Brown et al. (2014)

Source selected: 1

ID	Continuum	Renorm	Lines	Shape	Offset
A5V	8250	4.0			
F0I	7750	2.0			
F0V	7250	4.0			
F5I	7000	1.5			
F2V	7000	4.0			
F5V	6500	4.0			
F8V	6250	4.5			
G0V	6000	4.5			
G0III	5750	3.0			
G2V	5750	4.5			
G5V	5750	4.5			
G0I	5500	1.5			
G8V	5500	4.5			
G5III	5250	2.5			
G5I	4750	1.0			
K0V	5250	4.5			
K0III	4750	2.0			
K2V	4750	4.5			
K0I	4500	1.0			
K5V	4250	4.5			
K5III	4000	1.5			
K7V	4000	4.5			
K5I	3750	0.5			
M0I	3750	0.0			
M0III	3750	1.5			

Redshift

Extinction

Law

Ext. Magnitude

Ext. Bandpass



ETC: Demonstration

- Understand the workaround for modeling the flux from a giant planet
- Model scattered light from a giant planet for observations of a satellite
- Model a comet



ETC Moving Targets: On-line Resources

- JWST ETC web application: <https://jwst.etc.stsci.edu/>
- JWST ETC documentation: [Exposure Time Calculator Overview](#)
- Pandeia engine documentation: [JWST ETC Pandeia Engine Tutorial](#)
- Moving targets in the ETC: [JWST Moving Targets in ETC](#)

A deep space photograph showing a vast field of stars and a prominent blue nebula. The nebula is a complex, multi-colored structure with various shades of blue, purple, and brown, indicating different chemical compositions and temperatures. The stars are scattered throughout the field, with some appearing as bright, multi-pointed sources and others as smaller, dimmer points of light. The overall scene is a rich, multi-colored star-forming region.

Specifying Moving Targets



New Moving Target

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | II Tools | Stop

New Document | New

JWST What's New | HST What's New | Roadmap | Feedback

JWST Draft Proposal (PROVO1.aptx)

- Proposal Information
- Targets**
 - Fixed Targets
 - 4 M-35
 - Solar System Targets
 - Observations
 - Observation Folder
 - Observation 1
 - Observation 2
 - Visit 2:1
 - Observation Links

Targets of JWST Draft Proposal (PROVO1.aptx)

Targets

- Fixed Target Resolver: Resolve a target name or position
- New Fixed Target: Create a new Fixed Target
- New Target Group: Create a new Target Group
- New Solar System Target: Create a new Solar System Target
- New Generic Target: Create a new Generic Target
- Import Targets...: Import Fixed Targets from whitespace, CSV, TSV, or V

Edit PI: Mr. William Januszewski | New | Edit Fixed Targets

Fixed Ta...	Number	Name	Archive Na...	Category	Description	J2000 Coo...	RA Uncerta...
Show: Fixed Target: Equatorial							

3 errors & warnings (Click for Details)

Solar system targets
are fourth option
down



Moving Target Template

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings Run All Tools Stop

New JWST Proposal New Solar System Target JWST What's New HST What's New Roadmap Feedback

JWST Draft Proposal (Unsaved)

- Proposal Information
 - Proposal Description
 - PI: Mr. William Januszewski
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE**
 - Observations
 - Observation Links

1 IO-SURFACE-FEATURE of JWST Draft Proposal (Unsaved)

Number

Name in the Proposal (unique within proposal)

Name for the Archive (standard resolvable name)

Keyword

Description

Extended Recommended for spectroscopy (for advice to data reduction pipeline)

Level 1 Type Level 2 Type Level 3 Type

Summary No level information has been specified.

Comments

Edit Solar System Targets New Edit Observations

5 errors & warnings (Click for Details)

Selecting Level 1 type allows user to select standard body or define a minor body



Moving Target Levels

Level 1 refers to a target in orbit about the Sun.

- Planets, Asteroids, and Comets.

Level 2 refers to a target whose motion is normally described with respect to a Level 1 object.

- Planetary Satellites, Surface features on Planets, offsets from Asteroid or Comet.

Level 3 refers to a target whose motion is normally described with respect to a Level 2 object.

- Surface feature on planetary satellites, Pointing offset from planetary satellite.



Moving Target Template: Io

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings

New JWST Proposal | New Solar System Target

JWST What's New | HST What's New | Roadmap | Feedback

1 Unnamed Target of JWST Draft Proposal (Unsaved)

Number: 1

Name in the Proposal: (unique within proposal)

Name for the Archive: (standard resolvable name)

Keyword: None Selected

Description:

Extended: Unknown Recommended for spectroscopy (for advice to data reduction pipeline)

Level 1 Type: Level 2 Type: None Selected Level 3 Type: None Selected

Level 1 Type dropdown menu:

- None Selected
- Standard Target
- Comet
- Asteroid

Edit Solar System Targets | New | Edit Observations

9 errors & warnings (Click for Details)



Moving Target Template: Io

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New JWST Proposal | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

JWST Draft Proposal (Unsaved)

- Proposal Information
 - Proposal Description
 - PI: Mr. William Januszewski
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - STD Level 1 for 1 IO-SURFACE-FEATURE of JWST Draft Proposal (Unsaved)
 - Observations
 - Observation Links

STD Level 1 for 1 IO-SURFACE-FEATURE of JWST Draft Proposal (Unsaved)

Standard Target

- MARS
- CERES
- JUPITER
- SATURN
- URANUS
- NEPTUNE
- PLUTO
- HAUMEA

Edit 1 IO-SURFACE-FEATURE | New | Edit Observations

5 errors & warnings (Click for Details)



Moving Target Templates: Io

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New Document | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

1 IO-SURFACE-FEATURE of JWST Draft Proposal (PROVO1.aptx)

Number: 1

Name in the Proposal: IO-SURFACE-FEATURE (unique within proposal)

Name for the Archive: JUPITER (standard resolvable name)

Keyword: Satellite

Description: Moon of Jupiter

Extended: YES (Recommended for spectroscopy (for advice to data reduction pipeline))

Level 1 Type: Standard Target | Level 2 Type: **None Selected** | Level 3 Type: None Selected

Summary: Level 1: STD=JUPITER

Comments:

Edit Solar System Targets | New | Edit STD Level 1 for 1 IO-SURFACE-FEATURE

1 errors & warnings (Click for Details)

Jupiter is specified as a Level 1 standard body

Io is specified as a Level 2 body



Moving Target Templates: Io

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New Document | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

1 IO-SURFACE-FEATURE of JWST Draft Proposal (PROVO1.aptx)

Number: 1

Name in the Proposal: IO-SURFACE-FEATURE (unique within proposal)

Name for the Archive: IO (standard resolvable name)

Keyword: Satellite

Description: Moon of Jupiter

Extended: YES (Recommended for spectroscopy (for advice to data reduction pipeline))

Level 1 Type: Standard Target | Level 2 Type: Standard Target | Level 3 Type: None Selected

Summary: Level 1: STD=JUPITER
Level 2: STD=IO

Comments

Level 3 Type dropdown menu:

- None Selected
- ✓ None Selected
- Planetographic
- Planetocentric
- Position Angle
- Magneto
- Torus
- Satellite

Features on a Level 2 target are specified at Level 3

Edit Solar System Targets | New | Edit STD Level 1 for 1 IO-SURFACE-FEATURE

1 errors & warnings (Click for Details)



Planetographic Template – Level 3

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New Document | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

JWST Draft Proposal (PROVO1.aptx)

- Proposal Information
 - Proposal Description
 - PI: Mr. William Januszewski
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - STD Level 1 for 1 IO-SURFACE-FEATURE
 - STD Level 2 for 1 IO-SURFACE-FEATURE
 - PGraphic Level 3 for 1 IO-SURFACE-FEATURE**
 - Observations
 - Observation Links

PGraphic Level 3 for 1 IO-SURFACE-FEATURE of JWST Draft Proposal (PROVO1.aptx)

Longitude (degrees) 255.3
 Latitude (degrees) 18.7
 Altitude (km)
 Longitude Rate Of Change (degrees/day)
 Latitude Rate Of Change (degrees/day)
 Altitude Rate Of Change (km/day)
 Epoch None Selected

Edit STD Level 2 for 1 IO-SURFACE-FEATURE | New | Edit Observations

1 errors & warnings (Click for Details)

Planetographic template allows user to define latitude and longitude



Defined Target for Io Surface Feature

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New Document | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

JWST Draft Proposal (PROVO1.aptx)

- Proposal Information
 - Proposal Description
 - PI: Mr. William Januszewski
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE**
 - STD Level 1 for 1 IO-SURFACE-FEATURE
 - STD Level 2 for 1 IO-SURFACE-FEATURE
 - PGraphic Level 3 for 1 IO-SURFACE-FEATURE
 - Observations
 - Observation Links

1 IO-SURFACE-FEATURE of JWST Draft Proposal (PROVO1.aptx)

Number

Name in the Proposal (unique within proposal)

Name for the Archive (standard resolvable name)

Keyword

Description

Extended Recommended for spectroscopy (for advice to data reduction pipeline)

Level 1 Type Level 2 Type Level 3 Type

Summary
 Level 1: STD=JUPITER
 Level 2: STD=IO
 Level 3: TYPE=PGRAPHIC, LONG=255.3, LAT=18.7

Comments

Edit Solar System Targets | New | Edit STD Level 1 for 1 IO-SURFACE-FEATURE

1 errors & warnings (Click for Details)



Moving Target Template: Jupiter N Pole

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New Document | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

2 JUPITER-N-POLE of JWST Draft Proposal (PROVO1.aptx)

Number: 2

Name in the Proposal: JUPITER-N-POLE (unique within proposal)

Name for the Archive: JUPITER (standard resolvable name)

Keyword: Planet

Description: North Pole of Jupiter

Extended: YES (Recommended for spectroscopy (for advice to data reduction pipeline))

Level 1 Type: Standard Target | Level 2 Type: None Selected | Level 3 Type: None Selected

Summary: Level 1: STD=JUPITER

Comments:

Level 2 dropdown menu options:

- None Selected
- Standard Target
- Planetographic
- Planetocentric
- Position Angle
- Magneto
- Torus
- Satellite

Bottom bar: Edit PGraphic Level 3 for 1 IO-SURFACE-FEATURE | New | Edit STD Level 1 for 2 JUPITER-N-POLE

2 errors & warnings (Click for Details)

Jupiter is specified as the Level 1 target

Coordinate system is specified at Level 2



Position Angle Template

Astronomer's Proposal Tools Version 25.2.3 - JWST Draft Proposal (PROVO1.aptx)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New Document | New Solar System Target | JWST What's New | HST What's New | Roadmap | Feedback

JWST Draft Proposal (PROVO1.aptx)

- Proposal Information
 - Proposal Description
 - PI: Mr. William Januszewski
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - STD Level 1 for 2 JUPIT
 - PosAngle Level 2 for 2
 - Observations
 - Observation Links

PosAngle Level 2 for 2 JUPITER-N-POLE of JWST Draft Proposal (PROVO1.aptx)

Radius (arcsec)	19
Position Angle (degrees)	25
Reference Axis (NORTH, SUN)	NORTH
Radius Rate Of Change (arcsec/day)	
Angle Rate Of Change (degrees/day)	
Epoch	

Edit STD Level 1 for 2 JUPITER-N-POLE | New | Edit Observations

2 errors & warnings (Click for Details)

Radius is measured in arcsec from center of body

Position Angle is relative to Reference axis in degrees

Reference axis of North is for Celestial north



Minor Body Template

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | Timeline | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings

New JWST Proposal | New Solar System Target

What's New | Roadmap | Feedback

JWST Draft Proposal (Unsaved)

- Proposal Information
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - 3 VESTA**
 - Asteroid Level 1 for 3
 - Observations
 - Observation Links

3 VESTA of JWST Draft Proposal (Unsaved)

Number: 3

Name in the Proposal: VESTA (unique within proposal)

Name for the Archive: (standard resolvable name)

Keyword: Asteroid

Description: Large asteroid

Extended: Unknown Recommended for spectroscopy (for advice to data reduction pipeline)

Level 1 Type: Asteroid | Level 2 Type: None Selected | Level 3 Type: None Selected

Summary: Level 1: TYPE=ASTEROID, A=, E=, I=, O=, W=, M=, EQUINOX=J2000, EPOCH=, EpochTimeScale=

Background Target

Observations of this target require companion background observation(s)

Comments

Edit PosAngle Level 2 for 2 JUPITER-N-POLE | New | Edit Asteroid Level 1 for 3 VESTA

16 errors & warnings (Click for Details)



Minor Body Template

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings

New JWST Proposal New Solar System Target

What's New Road

JWST Draft Proposal (Unsaved)

- Proposal Information
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - 3 VESTA
 - Asteroid Level 1 for 3 VESTA
 - Observations
 - Observation Links

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search

Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

Orbital Elements

A (SemiMajor Axis, AU)

E (Eccentricity)

I (Inclination, degrees)

O (Longitude of Ascending Node, degrees)

W (ArgPerihelion, degrees)

M (Mean Anomaly, degrees)

Equinox

Epoch (Osculation Time)

Source of Orbital Elements

Edit 3 VESTA New Edit Observations

16 errors & warnings (Click for Details)

Look up target in the Horizons Database

Enter orbital elements manually



Horizons Interface

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | Timeline | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New JWST Proposal | New Solar System Target | What's New | Roadmap | Feedback

JWST Draft Proposal (Unsaved)

- Proposal Information
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - 3 VESTA
 - Asteroid Level 1 for 3**
 - Observations
 - Observation Links

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search
Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

Orbital Elements

Choose an Object

Object Name	NAIF ID	Primary Designation	Aliases
4 Vesta	2000004		

Source of Orbital Elements

Edit 3 VESTA | New | Edit Observations

16 errors & warnings (Click for Details)

To retrieve elements from Horizons enter the name of the body



Horizons Interface

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings Run All Tools Stop

New JWST Proposal New Solar System Target What's New Roadmap Feedback

JWST Draft Proposal (Unsaved)

- Proposal Information
 - Proposal Description
 - Team Expertise
 - PI: Mr. Weston Eck
 - Col: Blair Porterfield
- Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - STD Level 1 for 1 IO-SURFACE-FEATURE
 - STD Level 2 for 1 IO-SURFACE-FEATURE
 - PGraphic Level 3 for 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - STD Level 1 for 2 JUPITER-N-POLE
 - PosAngle Level 2 for 2 JUPITER-N-POLE
 - 3 VESTA
 - Asteroid Level 1 for 3 VESTA
 - Observations
 - Observation Links

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search
Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

NAIF Name

NAIF ID

Use Horizons for Orbital Elements Retrieval Checking this box will make the orbital elements uneditable

Orbital Elements

- A (SemiMajor Axis, AU)
- E (Eccentricity)
- I (Inclination, degrees)
- O (Longitude of Ascending Node, degrees)
- W (ArgPerihelion, degrees)
- M (Mean Anomaly, degrees)

Equinox

Epoch (Osculation Time)

Source of Orbital Elements

Edit 3 VESTA New Edit Observations

12 errors & warnings (Click for Details)

Checking this box imports the orbital elements in APT



Horizons Interface

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

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New JWST Proposal New Solar System Target What's New Roadmap Feedback

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 - STD Level 1 for 1 IO-SL
 - STD Level 2 for 1 IO-SL
 - PGraphic Level 3 for 1
 - 2 JUPITER-N-POLE
 - STD Level 1 for 2 JUPIT
 - PosAngle Level 2 for 2
 - 3 VESTA
 - Asteroid Level 1 for 3 VESTA
 - Observations
 - Observation Links

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search
Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

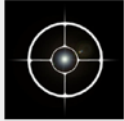
NAIF Name

NAIF ID

Use Horizons for Orbital Elements Retrieval Checking this box will make the orbital elements uneditable

Orbital Elements

Warning

 This will replace your current orbital element values with updated orbital elements for 4 Vesta from Horizons. This action is not undoable.

Source of Orbital Elements

Edit 3 VESTA New Edit Observations

12 errors & warnings (Click for Details)



Minor Body Template

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

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New JWST Proposal New Solar System Target What's New Roadmap Feedback

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 - Solar System Targets
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 - STD Level 2 for 1 IO-SURFACE-FEATURE
 - PGraphic Level 3 for 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - STD Level 1 for 2 JUPITER-N-POLE
 - PosAngle Level 2 for 2 JUPITER-N-POLE
 - 3 VESTA
 - Asteroid Level 1 for 3 VESTA
 - Observations
 - Observation Links

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search
Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

NAIF Name

NAIF ID

Use Horizons for Orbital Elements Retrieval *Checking this box will make the orbital elements uneditable*

Orbital Elements From Horizons
Click the "Update Orbital Elements From Horizons" button to request the latest orbital elements from Horizons.

Horizons Solution Date	<input type="text" value="2017-Apr-04 16:32:33"/>
Date Retrieved	<input type="text" value="2019-Sep-12 14:49:06"/>
A (SemiMajor Axis, AU)	<input type="text" value="2.361017006168899"/>
E (Eccentricity)	<input type="text" value="0.08940671368300425"/>
I (Inclination, degrees)	<input type="text" value="7.135497649691238"/>
O (Longitude of Ascending Node, degrees)	<input type="text" value="103.9831114166946"/>
W (ArgPerihelion, degrees)	<input type="text" value="150.0028930287553"/>
M (Mean Anomaly, degrees)	<input type="text" value="356.6858013642077"/>
Equinox	<input type="text" value="J2000"/>
Epoch (Osculation Time)	<input type="text" value="27-NOV-1992:00:00:00"/> <input type="button" value="TDB"/>
Source of Orbital Elements	<input type="text" value="Horizons"/>

4 errors & warnings (Click for Details)



Minor Body Template

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings Run All Tools Stop

New JWST Proposal | New Solar System Target What's New Roadmap Feedback

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 - Solar System Targets
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 - STD Level 2 for 1 IO-SURFACE-FEATURE
 - PGraphic Level 3 for 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - STD Level 1 for 2 JUPITER-N-POLE
 - PosAngle Level 2 for 2 JUPITER-N-POLE
 - 3 VESTA
 - AST Level 1 for 3 VESTA

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search
Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

NAIF Name

NAIF ID

Use Horizons for Orbital Elements Retrieval *Checking this box will make the orbital elements uneditable*

Orbital Elements From Horizons
Click the "Update Orbital Elements From Horizons" button to request the latest orbital elements from Horizons.

Horizons Solution Date

Date Retrieved

A (SemiMajor Axis, AU)

E (Eccentricity)

I (Inclination, degrees)

O (Longitude of Ascending Node, degrees)

W (ArgPerihelion, degrees)

M (Mean Anomaly, degrees)

Equinox

Epoch (Osculation Time)

Source of Orbital Elements

Retrieves an updated ephemeris if one is available

4 errors & warnings (Click for Details)



Minor Body Interface

Astronomer's Proposal Tools Version 27.2 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | Timeline | View in Aladin | BOT | Target Confirmation | PDF Preview | Submission | Errors and Warnings | Run All Tools | Stop

New JWST Proposal | New Solar System Target | What's New | Roadmap | Feedback

JWST Draft Proposal (Unsaved)

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 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - STD Level 1 for 1 IO-SURFACE-FEATURE
 - STD Level 2 for 1 IO-SURFACE-FEATURE
 - PGraphic Level 3 for 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - STD Level 1 for 2 JUPITER-N-POLE
 - PosAngle Level 2 for 2 JUPITER-N-POLE
 - 3 VESTA
 - ASTEROID Level 1 for 3 VESTA

Asteroid Level 1 for 3 VESTA of JWST Draft Proposal (Unsaved)

Horizons Search
Resolve the NAIF name and ID of the minor body to enable automatic retrieval of the orbital elements.

Search (Name, NAIF ID, or Primary Designation)

NAIF Name

NAIF ID

Use Horizons for Orbital Elements Retrieval *Checking this box will make the orbital elements uneditable*

Orbital Elements From Horizons
Click the "Update Orbital Elements From Horizons" button to request the latest orbital elements from Horizons.

Horizons Solution Date	<input type="text" value="2017-Apr-04 16:32:33"/>
Date Retrieved	<input type="text" value="2019-Sep-12 14:49:06"/>
A (SemiMajor Axis, AU)	<input type="text" value="2.361017006168899"/>
E (Eccentricity)	<input type="text" value="0.08940671368300425"/>
I (Inclination, degrees)	<input type="text" value="7.135497649691238"/>
Ω (Longitude of Ascending Node, degrees)	<input type="text" value="103.9831114166946"/>
W (ArgPerihelion, degrees)	<input type="text" value="150.0028930287553"/>
M (Mean Anomaly, degrees)	<input type="text" value="356.6858013642077"/>
Equinox	<input type="text" value="J2000"/>
Epoch (Osculation Time)	<input type="text" value="27-NOV-1992:00:00:00"/> <input type="button" value="TDB"/>
Source of Orbital Elements	<input type="text" value="Horizons"/>

4 errors & warnings (Click for Details)

Unchecking this box allows the user to manually edit the fields



Solar System Target Windows



Solar System Target Windows

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (PROVO1.aptx)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings Run All Tools Stop

New Document | New

What's New Roadmap Feedback

JWST Draft Proposal (PROVO1.aptx)

- Proposal Information
- Targets
 - Fixed Targets
 - Solar System Targets
 - 1 IO-SURFACE-FEATURE
 - 2 JUPITER-N-POLE
 - 3 SEDNA
 - 5 Unnamed Target
 - Observations
 - NIRCam Io Surface Feature
 - Observation 1
 - Observation 2
 - Observation 3
 - Observation Links

Observation 1 of JWST Draft Proposal (PROVO1.aptx)

Number: 1 Status: UNKNOWN Duplication:

Label:

Instrument: NIRCAM

Template: NIRCam Imaging

Coordinated Parallel:

Target: 1 IO-SURFACE-FEATURE

Visit Splitting:	Splitting Distance	Number of Visits
38.0 Arcsec		1

Duration (secs)	Science	Total Charged
7		2903

Data Volume: 89 MB

NIRCam Imaging Mosaic Properties Special Requirements **Solar System Target Windows** Comments

Observing Windows

- DEFAULT WINDOW: NOT OCCULTATION OF IO-SURFACE-FEATURE BY IO FROM JWST
- DEFAULT WINDOW: NOT OCCULTATION OF IO-SURFACE-FEATURE BY JUPITER FROM JWST
- DEFAULT WINDOW: SEPARATION OF IO-SURFACE-FEATURE EUROPA FROM JWST GREATER THAN 10"
- DEFAULT WINDOW: SEPARATION OF IO-SURFACE-FEATURE GANYMEDE FROM JWST GREATER THAN 10"
- DEFAULT WINDOW: SEPARATION OF IO-SURFACE-FEATURE CALLISTO FROM JWST GREATER THAN 10"

MOSS Planning Start:

MOSS Planning End:

MOSS Show Windows:

Add Observing Window... Remove Edit

Edit NIRCam Io Surface Feature New Edit Visit 1:1

10 errors & warnings (Click for Details)

In some cases default Solar System Windows will be added



Solar System Target Windows

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (PROVO1.aptx)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings Run All Tools Stop

New Document New What's New Roadmap Feedback

JWST Draft Proposal (PROVO1.aptx)

Observation 1 of JWST Draft Proposal (PROVO1.aptx)

Number 1 Status: UNKNOWN Duplication

Label

Instrument NIRCAM

Template NIRCAM Imaging

Coordinated Parallel

Target 1 IO-SURFACE-FEATURE

Splitting Distance

Visit Splitting: 38.0 Arcsec 1

Duration (secs) 7 290

Data Volume 89 MB

NIRCAM Imaging Mosaic Pro

Editing...

DEFAULT WINDOW: NOT OC

DEFAULT WINDOW: SEPARAT

DEFAULT WINDOW: SEPARAT

DEFAULT WINDOW: SEPARAT

DEFAULT WINDOW: SEPARAT

Observing Windows

Add Observing Window... Remove Edit

Edit NIRCAM Io Surface Feature New Edit Visit 1:1

10 errors & warnings (Click for Details)

Default Occultation Observing Window

This default window was provided because of your chosen level 1 and 2. Changing either of these will cause it to be deleted.

Within This Window? Not Within

Occulted Object 1 IO-SURFACE-FEATURE

Occulting Object IO

Observer JWST

DEFAULT WINDOW: NOT OCCULTATION OF IO-SURFACE-FEATURE BY IO FROM JWST

OK

Implicit Solar System Windows
cannot be removed or edited



Solar System Target Windows

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (PROVO1.aptx)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Submission Errors and Warnings Run All Tools Stop

New Document New What's New Roadmap Feedback

JWST Draft Proposal (PROVO1.aptx)

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 - Observation 3
 - Observation Links

Observation 1 of JWST Draft Proposal (PROVO1.aptx)

Number 1 Status: UNKNOWN Duplication

Label

Instrument NIRCAM

Template NIRCam Imaging

Coordinated Parallel

Target 1 IO-SURFACE-FEATURE

Splitting Distance 38.0 Arcsec Number of Visits 1

Duration (secs) 7 Data Volume 89 MB

NIRCam Imaging Mosaic

Observing Windows

MOSS Planning Start

MOSS Planning End

MOSS Show Windows

Default Eclipse Observing Window

This default window was provided because of your chosen level 1 and 2. Changing either of these will cause it to be deleted.

Within This Window? Not Within

Type (Penumbra/Umbra) Penumbral

Completeness Partial

Eclipsed Object 2 JUPITER-N-POLE

Eclipsing Object IO

Observer JWST

DEFAULT WINDOW: NOT ECLIPSE P PARTIAL OF JUPITER-N-POLE BY IO FROM JWST

OK

Edit NIRCam Io Surface Feature New Edit Visit 1:1

10 errors & warnings (Click for Details)

Most solar system windows have "Within" and "Not Within" options



Special Requirements

Solar System Special Requirements are a powerful tool for defining what conditions are occurring for optimal science return

Just don't get carried away.

Use the windows you need to meet your science goals but keep in mind that each requirement restricts scheduling windows.

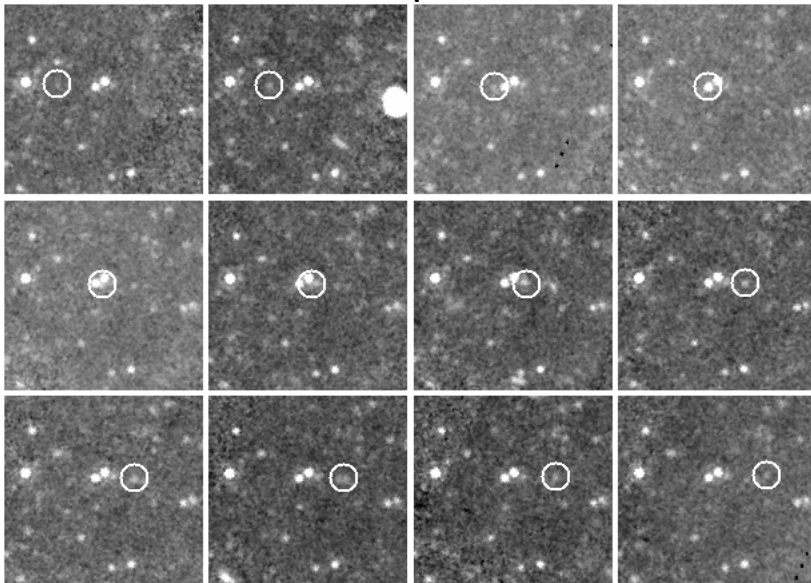


Special Requirements Example: Moving Follow-on

This strategy combines 2 or more observations of a target, taken close together in time, to remove most of the background objects from the data.

- This results in improved SNR for observations of targets that are comparable to the brightness of typical background objects (or fainter!).
- Many measurements made with *Spitzer* and *Herschel* would not have been possible had they not implemented moving follow-on constraints.

24 μm

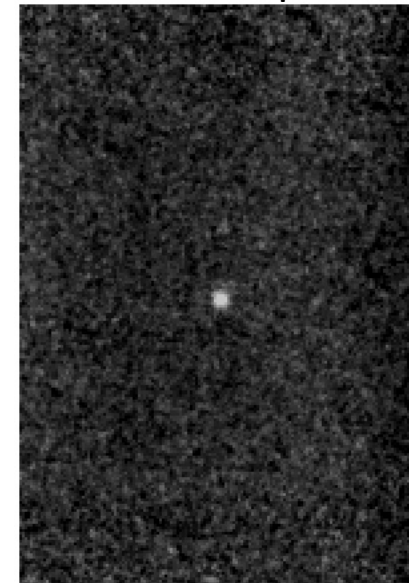


26308 (1998 SM165) - *Spitzer*

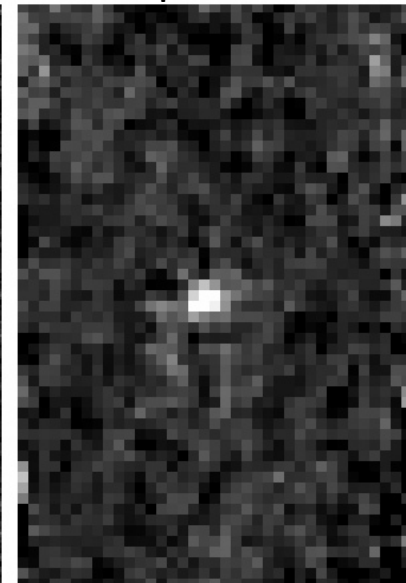
- 1) Co-add in sky coordinates
- 2) Subtract Sky from individual images
- 3) Coadd result in co-moving frame



24 μm



70 μm





Special Requirements Example: Moving Follow-on

For moving follow-on to work requires:

1. Target moves a significant distance relative to the PSF size (well-separated target observations).
2. Target moves significantly less than $\frac{1}{2}$ of the FOV of the individual observations.

APT Implementation:

1. Create 2 observations of the target.
2. Create a Special Requirement on the 2nd observation: *Timing* -> *After Observation* link.
 - Based on the apparent rate of motion (d''/dt) of the target, set the Min and Max Interval:
 1. Min: $d''/dt * \text{Min} > N * \text{FWHM}$ (where $N > 3$)
 2. Max: $d''/dt * \text{Max} < \text{FOV_size} * \text{Frac}$ (where $\text{Frac} < 0.3$)
3. If the apparent rate of motion varies significantly during the observing window, create a *Solar System Target* -> *Angular Rate Observing Window* on one observation.
 1. You will have to choose to constrain the angular rate to be $>$ or $<$ your preferred rate.
 2. Choose a limiting rate that satisfies the After Observation conditions above while providing maximum scheduling flexibility.
4. ***Check your results in Visit Planner!!***

Special Requirements Example: Moving Follow-on

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | Timeline | View in Aladin | BOT | Target Confirmation | PDF Preview | Check for Duplications | Submission | Errors and Warnings | Run All Tools | Stop

New JWST Proposal | New

What's New | Roadmap | Feedback

JWST Draft Proposal (Unsaved)

- Proposal Information
- Targets
 - Solar System Targets
 - 1 WEBB-JAMES-WEBB
 - Asteroid Level 1 for 1 V
 - Observations
 - Moving Follow-on Example
 - 1st Webb Observation (Ob)
 - 2nd Webb Observation (O)
 - Observation Links

2nd Webb Observation (Obs 2) of JWST Draft Proposal (Unsaved)

Number: 2 | Status: UNKNOWN | Duplication:

Label: 2nd Webb Observation

Instrument: NIRCAM

Template: NIRCam Imaging

Coordinated Parallel:

Target: 1 WEBB-JAMES-WEBB

Visit Splitting:	Splitting Distance	Number of Visits
38.0 Arcsec		1
	Science	Total Charged
Duration (secs): 30		3099
Data Volume: 108 MB		

NIRCam Imaging | Mosaic Properties | **Special Requirements** | Solar System Target Windows | Comments

Special Requirements

Implicit Requirements

- Timing**
 - After Date
 - Before Date
 - Between Dates
 - Phase
- Position Angle
 - After Observation Link
 - Group/Sequence Observations Link
- Offset
- Time Series Observation
- No Parallel
- On Hold
- Target Of Opportunity
- Maximum Visit Duration
- Background Limited

Edit Visit 1:1

Special Requirements
include Timing
options

Special Requirements Example: Moving Follow-on

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (Unsaved)

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New JWST Proposal New

What's New Roadmap Feedback

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 - 1st Webb Observation (Ob)
 - 2nd Webb Observation (Ob)
 - Observation Links

2nd Webb Observation (Obs 2) of JWST Draft Proposal (Unsaved)

Number: 2 Status: UNKNOWN Duplication:

Label: 2nd Webb Observation

Instrument: NIRCAM

Template: NIRCam Imaging

Coordinated Parallel:

Target: 1 WEBB-JAMES-WEBB

Visit Splitting:	Splitting Distance	Number of Visits
38.0 Arcsec		1

Duration (secs)	Science	Total Charged
30		3099

Data Volume: 108 MB

NIRCam Imaging Mosaic Properties **Special Requirements** Solar System Target Windows Comments

Editing...

Special Requirements

Implicit Requirements

After Observation Link

Schedule observation: 2nd Webb Observation (Obs 2)

After observation: 1st Webb Observation (Obs 1)

Min interval: 60 Mins

Max interval: 180 Mins

Exclusive Use Of Instrument:

2 After 1 by 60 Mins to 180 Mins

OK

The After Observation specifies observation order and spacing in time.

Special Requirements Example: Moving Follow-on

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (Unsaved)

Form Editor Spreadsheet Editor Orbit Planner Visit Planner Timeline View in Aladin BOT Target Confirmation PDF Preview Check for Duplications Submission Errors and Warnings Run All Tools Stop

New JWST Proposal | New | What's New Roadmap Feedback

JWST Draft Proposal (Unsaved)

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 - 1 WEBB-JAMES-WEBB
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 - Observations
 - Moving Follow-on Example
 - 1st Webb Observation (Ob)
 - 2nd Webb Observation (Ob)
 - Observation Links

2nd Webb Observation (Obs 2) of JWST Draft Proposal (Unsaved)

Number: 2 Status: UNKNOWN Duplication

Label: 2nd Webb Observation

Instrument: NIRCAM

Template: NIRCam Imaging

Coordinated Parallel:

Target: 1 WEBB-JAMES-WEBB

Visit Splitting:	Splitting Distance	Number of Visits
38.0 Arcsec	38.0 Arcsec	1

Duration (secs)	Science	Total Charged
30	30	3099

Data Volume: 108 MB

NIRCam Imaging Mosaic Properties Special Requirements **Solar System Target Windows** Comments

Observing Windows

- New Transit Observing Window
- New Solar Phase Observing Window
- New Distance Observing Window
- New Radial Velocity Observing Window
- New Orbital Longitude Observing Window
- New Occultation Window
- New Eclipse Observing Window
- New Central Meridian Longitude Observing Window
- New Angular Rate Observing Window**
- New Separation Observing Window
- New Apparent

Reset Default Windows Remove Edit

MOSS Planning Start

Angular Rate constraint is found under Solar System Target Windows

Special Requirements Example: Moving Follow-on

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (Unsaved)

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New JWST Proposal | New

What's New Roadmap Feedback

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 - 1st Webb Observation (Ob
 - 2nd Webb Observation (O
 - Observation Links

Parameter values depend on the FOV and PSF size, apparent rate of motion

2nd Webb Observation (Obs 2) of JWST Draft Proposal (Unsaved)

Number 2 Status: UNKNOWN Duplication

Label 2nd Webb Observation

Instrument NIRCAM

Template NIRCcam Imaging

Coordinated Parallel

Target 1 WEBB-JAMES-WEBB

Visit Splitting:	Splitting Distance	Number of Visits
38.0 Arcsec		1
	Science	Total Charged
Duration (secs)	30	3099
Data Volume	108 MB	

NIRCcam Imaging Mosaic Properties Special Requirements **X** Solar System Target Windows Comments

Angular Rate Observing Window

Within This Window? Within

Object 1 1 WEBB-JAMES-WEBB

Object 2 (optional) None Selected

Observer JWST

Condition (>, <, Min, Max) LESS THAN

X Rate (arcsec/sec) .0006

ANGULAR RATE WEBB-JAMES-WEBB FROM JWST LESS THAN

OK

X Observing Windows

MOSS Planning Start



Visualization: Moving Target Proxy

Astronomer's Proposal Tools Version 27.2 JWST PRD: PRDOPSSOC-L-023 - JWST Draft Proposal (Unsaved)

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | Timeline | View in Aladin | BOT | Target Confirmation | PDF Preview | Check for Duplications | Submission | Errors and Warnings | Run All Tools | Stop

New JWST Proposal | New

What's New | Roadmap | Feedback

1st Webb Observation (Obs 1) of JWST Draft Proposal (Unsaved)

Number: 1 | Status: UNKNOWN | Duplication:

Label: 1st Webb Observation

Instrument: NIRCAM

Template: NIRCam Imaging

Coordinated Parallel:

Target: **2 M-35** (Selected)

Visit Splitting: 80.0 Arcsec | 1

Duration (secs): 30 | 2983

Data Volume: 64 MB

NIRCam Imaging | Mosaic Properties | Special Requirements | Comments

Module: B

Subarray: SUB400P

Dither Parameters: SUBARRAY_DITHER | 2 | STANDARD | 1

#	Short Filter	Long Filter	Readout Patt...	Groups/Int	Integrations...	Total Dithers	Total Integra...	Total Expos...	ETC Wkbk.C...	ETC
1	F090W	F277W	RAPID	3	3	2	6	39.873		

Filters:

Edit Moving Follow-on Example | New | Edit Visit 1:1

Observa...	Number	Status	Duplication	Label	Science	Total Char...	Data Volume	Parallel Slo...	Instrument	Template	Coordinate...	Coordinate...	Target	Ni

Show: Observation

Use a fixed target as a proxy for your moving target



Moving Target Visualization: Proxy Fixed Target

Astronomer's Proposal Tools Version 27.2 JWST PRD: Aladin v8.1

Form Editor | Spreadsheet Editor | Orbit Planner | Visit Planner | Timeline | View in Aladin | BOT | Target Confirmation | PC | DSS | SDSS | 2MASS | WISE | GALEX | AKARI | Simbad | NED | IRIS | Spitzer | +

New JWST Proposal | New

JWST Draft Proposal (Unsaved)

- Proposal Information
- Targets
 - Fixed Targets
 - 2 M-35
 - Solar System Targets
 - 1 WEBB-JAMES-WEBB
 - Observations
 - Moving Follow-on Example
 - 1st Webb Observation (Ob)
 - 2nd Webb Observation (O)
 - Observation Links

APT Aladin

Create POS TARGETS | POS TARG XY Axes | FoV | Single Aperture | Opacity | Coverage Circles | Orient Ranges

Clear Selected | Clear All | Commit Selected | Commit All

SDSS9 color

Location: [] Frame: ICRSd

SDSS9 color

15" | 1.93" x 1.151"

279.5

1st Webb Observ | Visit 1:1 (JWST I | Orients Visit I | Visit 1:1 (JWST | Targets (JWST Dr | SDSS9 color

epoch - | size - | opac. - | zoom -

Frame: ICRSd

+180 +90 -180 -90

092.22674 +24.33399
1.193" x 1.151"

Search []

0 sel / 0 src 333fps / 84Mb

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APT Moving Targets: On-line JDox Resources

- Moving targets in APT: [Moving Targets in APT](#)
- APT Solar System Target Windows: [Solar System Special Requirements](#)
- Visualizing Moving Target Observations: [Tutorial on Visualizing Dithers of a Solar System Observation in APT](#)
- APT Special Requirements: [APT Special Requirements](#)
- ETC to APT interface: [ETC to APT Interface Support Information](#)
- APT Visit Planner: [APR Visit Planner](#)
- General APT documentation: [Astronomers Proposal Tool Overview](#)