The James Webb Space Telescope



Chris Willott, Herzberg Astrophysics, Victoria ASTR 511, 08 February 2018

esa

CSA ASC

Outline

What is JWST?

How can I use JWST?





What is JWST?





JWST's four science themes







Telescope is big and has broad wavelength coverage: 0.6 to 28 µm



JWST will improve sensitivity by order(s) of magnitude

limiting flux density (Jy)



Four instruments with multiple modes



A suite of imaging and spectroscopy modes



Spectroscopy comes in many flavors



©P. Ferruit



How can I use JWST?



STScI Invites Scientists To Submit Proposals for JWST Cycle 1

News Feature

November 30, 2017



We are pleased to announce that the JWST Cycle 1 call for proposals for general observer (GO) time has been released, with up to 6,000 hours available in this cycle. Observing programs will be offered in multiple categories, determined by program size and other criteria.

€ Program Category ◆	Size 🗢	Estimated Allocation* 🗢
Small programs	≤25 hours	3,500 hours
Medium programs	>25 and ≤ 75 hours	1,500 hours
Large programs	>75 hours	1,000 hours

* Subject to TAC adjustment.

In addition, the Cycle 1 call supports Calibration Proposals, Long-Term Proposals, Treasury Proposals, and Survey Proposals. We also invite proposals for Theory Programs, Data Science Software development, and Archival Programs to support analysis of calibration and the Director's Discretionary Early Release Science (DD-ERS) data.

Proposals are due by 8 p.m. Eastern Time on April 6, 2018. The Cycle 1 Time Allocation Committee will meet in late June 2018, with selections announced in July 2018.

For more details, please consult the <u>full call for proposals</u> C. Questions may be submitted to the <u>JWST Help Desk</u> C.

Cycle 1 General Observer (GO) proposals are due by April 6, 2018



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JWST Cycle 1 proposals are due by April 6th, 2018, in one single phase.



James Webb Space Telescope User Documentation

HOME INSTRUMENTS -

5 • PLANNING •

CALL FOR PROPOSALS - DATA -

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JWST User Documentation Home

JWST user documentation, informally known as "JDox," is available as a collection of articles on the Web. Unlike conventional HST handbooks, JDox is intended as an agile, user-friendly source of information that follows the Wikipedia-like Every Page is Page One (EPPO) philosophy. Our goal is to provide short, focused, well-linked articles that provide the kinds of information found in traditional HST instrument handbooks, data handbooks, and calls for proposals.

All JDox articles are separated into four sections: (1) JWST Observatory and Instrumentation, (2) JWST Observation Planning, (3) JWST Opportunities and Policies, and (4) JWST Data Calibration and Analysis. These articles provide details about the observatory and instruments, descriptions of tools used for proposing, advice on observing strategies, "cookbooks" that guide users through the proposal preparation process, as well as information about calibration and analysis of JWST data.

While downloadable PDF files for these four JDox sections will be generated for each cycle, the online content will be constantly updated with the latest information.

Please refer to this figure to get started in exploring this website using the navigation bar, search bar, and links, as well as the page tree on the right of

Google: "JWST user documentation" & "JWST pocket guide"

Series of proposal preparation webinars November 2017 – February 2018 organized by the Canadian JWST team.

Recordings, presentations and files at

http://jwst.astro.umontreal.ca/?page_id=702_Google: "JWST webinars montreal"

ETC web and python engine

Slitless & IFU calculations

Slitless and IFU calculations performed on scenes with multiple extended sources

Calculations Scenes and Sources Upload Spectra Caveats and Limitations

MIRI + NIRCam + NIRISS + NIRSpec +								
ID-	Plot	Mode -	Scene -	(s) -	SNR -	A		
9		nirspec ifu	1	4402.07	0.28	0		
8		miri mrs	1	2220.00	2.2e-3	0		
7P								
6	•	nircam wfgrism	1	1964.83	0.03	0		
3		niriss wfss	1	440.21	0.43	0		
2		niriss wfss	1	440.21	0.38	0		
1		niriss imaging	1	590.52	6.98	0		
-	-		-		,-	-		

0.20







Report Warnings Errors Downloads	
Instrument Filter/Disperser:	f356w/grismr
Extraction Aperture Position (arcsec):	[0.70, -0.50]
Wavelength of Interest used to Calculate Scalar Values (microns)	: 3.62
Size of Extraction Aperture (arcsec):	0.15
Total Time Required for Strategy (seconds):	1964.83
Total Exposure Time (seconds):	1964.83
Extracted Flux (e-/sec):	1.5e-3
Standard Deviation in Extracted Flux (e-/sec):	0.05
Extracted Signal-to-Noise ratio:	0.03
nput Background Surface Brightness (MJy/sr):	0.13
Total Background Flux in Extraction Aperture (e-/sec):	1.88
Total Sky Background Flux in Extraction Aperture (e-/sec):	1.88
Fraction of Total Background due to Signal From Scene:	2.7e-3
Average Number of Cosmic Rays per Ramp:	0.16

JWST's field of regard



Target visibility windows



Targets in the ecliptic plane are accessible for approximately 53 continuous days twice a year.

Background and Visibility Tools



APT templates

É APT File Edit Tools Form	Editor Help U 🔂 🕹 🗘 46% 🗈 🖼 Wed Dec 3	0 3:39 PM 🔒 🔍 😑
	Astronomer's Proposal Tools Version 23.4.2 - JWST Draft Proposal (wfss_example.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 JWST Proposal \bigtriangledown New \bigtriangledown	🐣 JWST What's New 🛛 🍂 HST What's New	b Roadmap 🛛 💭 Feedback
🔻 🐴 JWST Draft Proposal (wfss_examp	WFSS, F150W (Obs 1) of JWST Draft Proposal (wfss_example.aptx)	
🔻 🐼 Proposal Information		
Proposal Description	Number 1	
👗 Unnamed PI	Label WFSS, F150W	
🔻 🐻 Targets	Instrument	
🔻 🙀 Fixed Targets	NIRISS Imaging	
1 FIELD1	Template VIRISS Wide Field Silitiess Spectroscopy	
 Observations 	Target NIRISS Aperture Masking Interferometry	
Observation Folder	Splitting Distance Number of Visits	
▼ ④ WFSS, F150W (Obs 1)	Visit Splitting: 30.0 Arcsec 9	
🖾 Visit 1:1	Science Total Charged	
🚨 Visit 1:2	Duration (secs) 31932 47121	
🚨 Visit 1:3	Data volume: 7 550 MP	
🖾 Visit 1:4		
🚨 Visit 1:5	NIRISS Wide Field Slitless Spectroscopy Mosaic Properties Special Requirements Comments	
🛂 Visit 1:6		
🗳 Visit 1:7	Science Observation	
🚨 Visit 1:8	WFSS Dither Name WFSS4PT \$	
Si Visit 1:9	Filter F150W \$ Grism BOTH \$	
WFSS, F200W (Obs 2)	Readout Pattern No. of Groups No. of Integrations. Photon Collect Duration Total Photon Collect Duration	
Visit 2:1		
Visit 2:2		
Visit 2:3	V Direct Image	
VISIT 2:4	DI Readout Pattern DI No. of Groups DI No. of Integrations DI Photon Collect Duration DI Total Photon Collect Duration	
VISIL 2:5	DI Exposure Time NISRAPID \$ 10 1 107.368 107.368	
	Edit Observation Folder /	
P Observation Links	Observa 🛆 Number Label Science Total Char Instrument Template Target Number of Splitting Di Comments	
	WFSS, F15 1 WFSS, F15 31932 47121 NIRISS NIRISS Vid 1 FIELD1 9 30.0 Arcsec WFSS, F20 2 WFSS, F20 31932 47121 NIRISS NIRISS NIRISS 30.0 Arcsec	
	Show: Observation	Å
	× 20	errors & warnings (Click for Details)





The 2020s.... Get ready for an exciting time in astronomy!





