



4557 - JWST/NIRSpec confirmation of z~3 transients found by JWST/NIRCam

Cycle: 2, Proposal Category: DD

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JWST Proposal 4557 (Created: Wednesday, October 18, 2023 at 3:00:54 PM Eastern Standard Time) - Overview

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	3	plan_639_v2	NIRSpec MultiObject Spectroscopy	(3) mpt_input_2023_09_25
	25	plan_2023_10_31	NIRSpec MultiObject Spectroscopy	(4) mpt_input_2023_10_17

ABSTRACT

JWST has opened up a new window of time-domain science in the infrared at unprecedented sensitivity. This is pushing the search for supernovae to higher redshifts and will likely find new types of transients. This DDT program will target three transients recently discovered by the only NIRCcam monitoring program spanning the full duration of JWST Cycle 1, which had 3 epochs of 4-band NIRCcam observations with a 6-month cadence in the historic Spitzer IRAC Dark Field. The NIRCcam monitoring was facilitated by a separate HST ACS program whose observations were contemporaneous with the 2nd and 3rd NIRCcam epochs. We propose these three transients for NIRSpec MSA spectroscopy because they are likely at $z \sim 3$, which is in the redshift frontier for transients that is just beginning to be explored by JWST. In addition, they are all special: (1) one has no detectable host to 30.4 mag (2-sigma) and its SED has a very sharp break (>2.7 mag) at $\sim 7000\text{\AA}$ suggestive of $z \sim 4.7$; (2) one is associated with a galaxy at $z \sim 3$ and its SED is consistent with a SN Ia; (3) one has lasted for over 6 months but has an SED difficult to be explained by a slow-changing SN IIP, and its host galaxy is likely at $z \sim 2.9$. As the confirmed redshift record for SNe of any type is $z = 2.37$, these transients are strong contenders of a new record. This is the first time that such diverse high- z IR transients are revealed in detail, all in one blank field of 14.2 arcmin^2 . Spectroscopic confirmations from this DDT program will present a unique opportunity to put the JWST exploration of the transient IR sky on a solid

footing, regardless of whether these three transients are SNe or something even more interesting.

OBSERVING DESCRIPTION

This program is to do NIRSpec MSA prism spectroscopy on three transients recently found (July 2023) from a unique JWST NIRCам monitoring program that spanned the full duration of Cycle 1 in three epochs that were 6 months apart. The field (Spitzer IRAC Dark Field) is in the JWST CVZ, but we do have a special request on the observing window. The three transients can be covered by the MSA in one pointing, but the PA has to be around 210 degrees to put all three onto good slits. This limits the observing window to October 2023.

Proposal 4557 - Targets - JWST/NIRSpec confirmation of z~3 transients found by JWST/NIRCam

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(3)	mpt_input_2023_09_25	RA: 17 40 10.4222 (265.0434258d) Dec: +68 58 50.63 (68.98073d) Equinox: J2000		
<i>Comments:</i> Description=[]					
(4)	mpt_input_2023_10_17	RA: 17 40 10.3446 (265.0431025d) Dec: +68 59 21.35 (68.98926d) Equinox: J2000			
<i>Comments:</i> Description=[]					

Proposal 4557 - Observation 3 - JWST/NIRSpec confirmation of z~3 transients found by JWST/NIRCam

Wed Oct 18 20:00:54 GMT 2023

Observation	Proposal 4557, Observation 3: plan_639_v2 Diagnostic Status: Warning Observing Template: NIRSpec MultiObject Spectroscopy										
	(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(3)	mpt_input_2023_09_25	RA: 17 40 10.4222 (265.0434258d) Dec: +68 58 50.63 (68.98073d) Equinox: J2000			Comments: Description=[]					
Acquisition	#	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	Filter: CLEAR; Readout: NRSRAPIDD1; 8 sources in 3 quads; [Reduced Accuracy]	SAME	CLEAR	Auto Acq MSA Config	NRSRAPIDD1	3	1	4	257.682	
Template	TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold				
	MSATA	No	MSA Center	program_galaxies (45 sources)	program_galaxies (45 sources)	jwst-nirspec-prism	1.5				
Reference Stars	Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude	
	1	3220	265.087643	68.964292	22.89	1	6643	265.043103	68.977370	23.20	
	1	3698	265.141564	68.965875	22.59	1	8923	264.998582	68.989263	22.89	
	1	4377	265.016669	68.969682	22.67	1	9145	265.115654	68.990834	23.31	
	1	6197	265.038039	68.975061	23.41	1	10570	265.151384	69.002249	23.27	
Spectral Elements	#	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
	1	1 (PRISM/CLEAR)	c1	3 Shutter Slitlet	265.08712375000 005 Degrees 68.986663888888 88 Degrees	210.15132460554 298			3	24	28360.802

Proposal 4557 - Observation 3 - JWST/NIRSpec confirmation of z~3 transients found by JWST/NIRCam

Special Requirements

Before Date 01-NOV-2023:00:00:00
Aperture PA Range 210.110535 to 210.110535 Degrees (V3 71.5359653 to 71.5359653) [MSA Selected]
MSA Scheduled Aperture PA 210.1105 to 210.1105 Degrees (V3 71.5359653 to 71.5359653)

Proposal 4557 - Observation 25 - JWST/NIRSpec confirmation of z~3 transients found by JWST/NIRCam

Wed Oct 18 20:00:54 GMT 2023

Observation	Proposal 4557, Observation 25: plan_2023_10_31 Diagnostic Status: Warning Observing Template: NIRSpec MultiObject Spectroscopy										
	(plan_2023_10_31 (Obs 25)) Warning (Form): Config c1 (#1) has 2 master background shutters affected by failed open or closed shutters. (Visit 25:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(4)	mpt_input_2023_10_17	RA: 17 40 10.3446 (265.0431025d) Dec: +68 59 21.35 (68.98926d) Equinox: J2000			Comments: Description=[]					
Acquisition	#	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	Filter: CLEAR; Readout: NRSRAPIDD1; 8 sources in 4 quads; [IFU Level Accuracy]	SAME	CLEAR	Auto Acq MSA Config	NRSRAPIDD1	3	1	4	257.682	
Template	TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold				
	MSATA	No	MSA Center	galaxies (29 sources)	galaxies (29 sources)	jwst-nirspec-prism	1.5				
Reference Stars	Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude	
	1	6944	265.164878	68.984707	22.21	1	9145	265.115654	68.990834	23.31	
	1	7198	265.032798	68.981297	23.29	1	90145	265.129020	69.021629	22.078111	
	1	7207	265.131329	68.980980	22.28	1	90268	265.026747	69.016767	21.925054	
	1	7555	265.134500	68.982610	22.04	1	90577	265.135220	69.006075	22.083052	
Spectral Elements	#	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
	1	1 (PRISM/CLEAR)	c1	3 Shutter Slitlet	265.08736041666 67 Degrees 69.000955555555 55 Degrees	185.41645911346 274			3	24	28360.802

Proposal 4557 - Observation 25 - JWST/NIRSpec confirmation of z~3 transients found by JWST/NIRCam

Special Requirements

Between Dates 30-OCT-2023:00:00:00 and 06-NOV-2023:00:00:00
Aperture PA Range 185.375137 to 185.375137 Degrees (V3 46.8005673 to 46.8005673) [MSA Selected]
MSA Scheduled Aperture PA 185.3751 to 185.3751 Degrees (V3 46.8005673 to 46.8005673)