



# 12470 - The first James Webb Space Telescope Observations of an early-time, nearby tidal disruption event

Cycle: 4, Proposal Category: DD

## INVESTIGATORS

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## OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	1		MIRI Medium Resolution Spectroscopy	(1) AT2025aarm
	2		NIRSpec IFU Spectroscopy	(1) AT2025aarm

## ABSTRACT

Tidal disruption events offer a unique way to probe accretion around massive black holes, outflow launching, and the structure of galaxy nuclear regions in real time. The recently discovered TDE2025aarm is one of the nearest and youngest TDEs to date. These two factors combined make TDE2025aarm an extraordinary event that will be characterized across the electromagnetic spectrum. JWST is the only observatory that can characterize the mid-infrared emission that will probe the structure of the circumnuclear medium in this event. We propose for MIRI/MRS and NIRSpec IFU observations to characterize the dynamics and structure of dust and gas in the system. These observations will be the most sensitive, earliest characterization of a TDE in the infrared yet.

### **OBSERVING DESCRIPTION**

We aim to obtain MIRI MRS, MIRI imaging, and NIRSPEC IFU observations of a bright transient located at the center of a galaxy. We will acquire using the center of the galaxy. Although the galaxy is extended, it is strongly nucleated and has a bright transient in the nucleus, so we expect it to act as effectively a point source. We will observe using all channel of the MRS with simultaneously imaging, where the imaging bands are chosen to span the mid-infrared range. We will observe with three NIRSPEC IFU filters to fully span the near-infrared range. The total time request is 2.4hrs science/5hrs charged.

Proposal 12470 - Targets - The first James Webb Space Telescope Observations of an early-time, nearby tidal disruption event

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	AT2025aarm	RA: 04 32 12.3900 (68.0516250d) Dec: -05 22 39.58 (-5.37766d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0	Comments: Category= <i>Galaxy</i> Description= <i>[Elliptical galaxies, Galactic accretion disks]</i>

Proposal 12470 - Observation 1 - The first James Webb Space Telescope Observations of an early-time, nearby tidal disruption event

Fri Dec 05 05:00:20 GMT 2025

<b>Observation</b>	<b>Proposal 12470, Observation 1</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Medium Resolution Spectroscopy												
	(Observation 1) Warning (Form): Imager Filter overlap. (Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.												
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>				<b>Targ. Coord. Corrections</b>			<b>Miscellaneous</b>			
	(1)	AT2025aarm	RA: 04 32 12.3900 (68.0516250d) Dec: -05 22 39.58 (-5.37766d) Equinox: J2000				Proper Motion RA: 0 Proper Motion Dec: 0						
<i>Comments:</i> Category=Galaxy Description=[Elliptical galaxies, Galactic accretion disks]													
<b>Acquisition</b>	<b>#</b>	<b>Target</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>				
	1	SAME	F1500W	FAST	10	1	1	27.75	279726				
<b>Template</b>	<b>Primary Channel</b>			<b>Simultaneous Imaging</b>			<b>Imager Subarray</b>			<b>Grating Wheel Direction</b>			
	All MRS			YES			FULL			Allow Auto Reorder			
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>				<b>Optimized For</b>			<b>Direction</b>				
	1	4-Point				POINT SOURCE			NEGATIVE				
<b>Spectral Elements</b>	<b>#</b>	<b>Wavelength Range</b>	<b>Detector</b>	<b>Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/E xp</b>	<b>Exposures/Dit h</b>	<b>Dither</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1		IMAGER	F560W	FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	1	SHORT(A)	MRSLONG		FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	1	SHORT(A)	MRSSHORT		FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	2		IMAGER	F1000W	FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	2	MEDIUM(B)	MRSLONG		FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	2	MEDIUM(B)	MRSSHORT		FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	3		IMAGER	F1800W	FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	3	LONG(C)	MRSLONG		FASTR1	25	4	1	Dither 1	4	16	1143.316	279726
	3	LONG(C)	MRSSHORT		FASTR1	25	4	1	Dither 1	4	16	1143.316	279726

Proposal 12470 - Observation 2 - The first James Webb Space Telescope Observations of an early-time, nearby tidal disruption event

Fri Dec 05 05:00:20 GMT 2025

<b>Observation</b>	<b>Proposal 12470, Observation 2</b> <b>Diagnostic Status: Warning</b> Observing Template: NIRSpec IFU Spectroscopy											
<b>Diagnostics</b>	(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
<b>Fixed Targets</b>	<b>#</b>	<b>Name</b>	<b>Target Coordinates</b>			<b>Targ. Coord. Corrections</b>			<b>Miscellaneous</b>			
	(1)	AT2025aarm	RA: 04 32 12.3900 (68.0516250d) Dec: -05 22 39.58 (-5.37766d) Equinox: J2000			Proper Motion RA: 0 Proper Motion Dec: 0						
	<i>Comments:</i> Category=Galaxy Description=[Elliptical galaxies, Galactic accretion disks]											
<b>Template</b>	<b>TA Method</b>						<b>HFF Readout Mode</b>					
	NONE						false					
<b>Dithers</b>	<b>#</b>	<b>Dither Type</b>		<b>Size</b>	<b>Starting Point</b>			<b>Number of Points</b>	<b>Points</b>			
	1	4-POINT-DITHER										
<b>Spectral Elements</b>	<b>#</b>	<b>Grating/Filter</b>	<b>Readout Pattern</b>	<b>Groups/Int</b>	<b>Integrations/Exp</b>	<b>Leakcal</b>	<b>Dither</b>	<b>Autocal</b>	<b>Total Dithers</b>	<b>Total Integrations</b>	<b>Total Exposure Time</b>	<b>Optional ETC ID</b>
	1	G140H/F100LP	NRSIRS2RAPI D	30	1	false	true	NONE	4	4	1809.022	279726
	2	G235H/F170LP	NRSIRS2RAPI D	30	1	false	true	NONE	4	4	1809.022	279726
	3	G395M/F290LP	NRSIRS2RAPI D	10	3	false	true	NONE	4	12	1925.733	279726