



9235 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Cycle: 3, Proposal Category: DD

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
MIRI Eclipses				
	1	GJ3929b Eclipse 1	MIRI Imaging	(1) GJ3929
	2	GJ3929b Eclipse 2	MIRI Imaging	(1) GJ3929
	3	GJ3929b Eclipse 3	MIRI Imaging	(1) GJ3929
	4	GJ3929b Eclipse 4 - Part 1	MIRI Imaging	(1) GJ3929
	5	GJ3929b Eclipse 4 - Part 2	MIRI Imaging	(1) GJ3929
Pre-Slew Configuration				
	101	Pre-Slew for Eclipse 1	MIRI External Flat	NONE
	202	Pre-Slew for Eclipse 2	MIRI External Flat	NONE
	303	Pre-Slew for Eclipse 3	MIRI External Flat	NONE
	404	Pre-Slew for Eclipse 4	MIRI External Flat	NONE

ABSTRACT

Rocky Worlds is a joint JWST and HST Director’s Discretionary Program designed to implement the top recommendations from the Working Group on Strategic Exoplanet Initiatives with HST and JWST. The JWST side of the Rocky Worlds DDT focuses on secondary eclipse measurements of rocky exoplanets orbiting nearby M dwarfs. We will take secondary eclipse time series observations at 15 microns with the MIRI/F1500W photometric filter. With these observations we will measure the dayside temperatures of these rocky worlds, which can be compared to planetary models to interpret whether or not an atmosphere may be present. The Rocky Worlds DDT will advance our understanding of individual rocky exoplanets and broadly explore the existence of an M-dwarf Cosmic Shoreline. Follow-up, complementary observations of Rocky Worlds targets are encouraged.

Each rocky world observed by JWST in the Rocky Worlds DDT program has its own set of Program IDs. The observations in this program will focus on GJ 3929 b.

OBSERVING DESCRIPTION

This DDT program will observe secondary eclipses of a sample of rocky planets orbiting M dwarfs with MIRI Imaging photometry at 15 microns using the F1500W filter. The goal of the observations is to measure the dayside temperature as a proxy for the planet's heat redistribution, as well as to measure possible absorption signatures by CO₂. The JWST observations will be combined with HST ultraviolet to blue-optical observations to characterize the host star. The stellar UV spectrum is an essential input for models of atmospheric loss and photochemistry.

The 4 eclipse observations of GJ 3929 b are designed to (a) enable a differentiation, at 3-sigma, between an exoplanet with full redistribution of energy from the day to the nightside, assuming an albedo of 0.3, and a bare rock scenario (modeled as a blackbody), with an assumed albedo of 0.1, and (b) account for the uncertainty on the time of secondary eclipse. The former definition sets the number of eclipses to observe (4), assuming noise properties coming from the JWST Exposure Time Calculator. The latter defines the observing time and phase-constraints ingested in this APT file, computed using a "Tinker Scheduling" algorithm, for which it was calculated a risk of only ~10% of missing the eclipses if the orbit is truly eccentric. The risk of missing the eclipses if the orbit is circular is zero.

These observations are in turn divided in two "Checkpoints", after which assessments will be made by the Core Implementation Team (CIT) and the Science Advisory Committee (SAC). Checkpoint 1 (set to Observation 2), will try to detect the eclipse of GJ 3929 b at 3-sigma, which is the best case scenario assuming a bare rock. To add the possibility of slight deviations from the JWST ETC calculations, we have estimated that if the eclipse depth error is 25% larger than the ETC calculation, we should make this detection on the second eclipse. In the event that the eclipse is confidently detected after Checkpoint 1, we will be able to shorten the subsequent observing windows for Observations 3—5. This is why Observations 3—5 are put on hold until Observations 1 and 2 are taken and inspected, and why there is a separation of 6 weeks between Observations 2 and 3 (to allow enough time to perform internal CIT calculations to study the eclipse detectability). If the eclipse is not detected after Checkpoint 1, subsequent observations will continue as planned in the APT submission made on June 2025. The second Checkpoint, set to the 4th eclipse observation (Observations 4 and 5), completes the set of observations to perform the differentiation between full redistribution and a bare rock described above.

Note that the 4th eclipse observation is divided between Observations 4 and 5, which are linked observations. This is due to the frame limit being reached during the 7.3-hour integration of the 4th eclipse observation. We set the break in the exposures assuming an early start of the first exposure in the 1-hour scheduling window (i.e., the minimum phase constraint), and place it between the most likely eccentric and circular solutions found by our global fits to available data on the GJ 3929 system. The break is expected to last a few minutes.

JWST Proposal 9235 (Created: Thursday, January 22, 2026, 8:00:15PM Eastern Standard Time) - Overview

More information about the details of the scheduling constraints can be found in the Rocky Worlds DDT webpage (rockyworlds.stsci.edu), which has a full report of the observing strategy defined for GJ 3929 b.

Proposal 9235 - Targets - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	GJ3929	RA: 15 58 18.6104 (239.5775433d) Dec: +35 24 29.37 (35.40816d) Equinox: J2000	Proper Motion RA: -143.05937540596338 mas/yr Proper Motion Dec: 318.11994811695337 mas/yr Parallax: 0.06317265565406137" Epoch of Position: 2016.0	
<i>Comments: Object has been updated manually with Gaia DR3 coordinates, proper motions, parallax, and epoch. Done by M. Alam, checked by T. Baines.</i> Category=Star Description=[M dwarfs] Extended=NO					

Proposal 9235 - Observation 1 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 1: GJ3929b Eclipse 1</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI Imaging</p>										
Diagnostics	<p>(GJ3929b Eclipse 1 (Obs 1)) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.</p> <p>(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(1)	GJ3929	RA: 15 58 18.6104 (239.5775433d) Dec: +35 24 29.37 (35.40816d) Equinox: J2000			Proper Motion RA: -143.05937540596338 mas/yr Proper Motion Dec: 318.11994811695337 mas/yr Parallax: 0.06317265565406137" Epoch of Position: 2016.0					
	<p><i>Comments: Object has been updated manually with Gaia DR3 coordinates, proper motions, parallax, and epoch. Done by M. Alam, checked by T. Baines.</i></p> <p><i>Category=Star</i></p> <p><i>Description=[M dwarfs]</i></p> <p><i>Extended=NO</i></p>										
Template	<p>Subarray</p> <p>SUB128</p>										
Spectral Elements	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F1500W	FASTR1	47	3387	1	None	1	3387	19352.928	242464
Special Requirements	<p>Phase 0.9412646 to 0.9571923 with period 2.6162644 Days and zero-phase 2460789.0854564 HJD</p> <p>Time Series Observation</p> <p>No Parallel Attachments</p> <p>2 After 1 by 21 Days to <None specified></p> <p>Sequence Observations 101, 1 (reordered), Non-interruptible</p>										

Proposal 9235 - Observation 2 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 2: GJ3929b Eclipse 2</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI Imaging</p>										
Diagnostics	<p>(GJ3929b Eclipse 2 (Obs 2)) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.</p> <p>(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(1)	GJ3929	RA: 15 58 18.6104 (239.5775433d) Dec: +35 24 29.37 (35.40816d) Equinox: J2000			Proper Motion RA: -143.05937540596338 mas/yr Proper Motion Dec: 318.11994811695337 mas/yr Parallax: 0.06317265565406137" Epoch of Position: 2016.0					
	<p><i>Comments: Object has been updated manually with Gaia DR3 coordinates, proper motions, parallax, and epoch. Done by M. Alam, checked by T. Baines.</i></p> <p><i>Category=Star</i></p> <p><i>Description=[M dwarfs]</i></p> <p><i>Extended=NO</i></p>										
Template	<p>Subarray</p> <p>SUB128</p>										
Spectral Elements	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F1500W	FASTR1	47	3863	1	None	1	3863	22072.754	242464
Special Requirements	<p>Phase 0.9352609 to 0.9511885 with period 2.6162644 Days and zero-phase 2460789.0697490 HJD</p> <p>Time Series Observation</p> <p>No Parallel Attachments</p> <p>2 After 1 by 21 Days to <None specified></p> <p>Sequence Observations 202, 2 (reordered), Non-interruptible</p>										

Proposal 9235 - Observation 3 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 3: GJ3929b Eclipse 3</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI Imaging</p>										
Diagnostics	<p>(GJ3929b Eclipse 3 (Obs 3)) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.</p> <p>(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(1)	GJ3929	RA: 15 58 18.6104 (239.5775433d) Dec: +35 24 29.37 (35.40816d) Equinox: J2000			Proper Motion RA: -143.05937540596338 mas/yr Proper Motion Dec: 318.11994811695337 mas/yr Parallax: 0.06317265565406137" Epoch of Position: 2016.0					
	<p><i>Comments: Object has been updated manually with Gaia DR3 coordinates, proper motions, parallax, and epoch. Done by M. Alam, checked by T. Baines.</i></p> <p><i>Category=Star</i></p> <p><i>Description=[M dwarfs]</i></p> <p><i>Extended=NO</i></p>										
Template	<p>Subarray</p> <p>SUB128</p>										
Spectral Elements	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F1500W	FASTR1	47	3891	1	None	1	3891	22232.744	242464
Special Requirements	<p>Between Dates 30-JAN-2026:22:50:00 and 30-JAN-2026:23:50:00</p> <p>Phase 0.9349023 to 0.9508299 with period 2.6162644 Days and zero-phase 2460789.0688109 HJD</p> <p>Time Series Observation</p> <p>No Parallel Attachments</p> <p>Sequence Observations 3, 4 within 700 Days</p> <p>Sequence Observations 303, 3 (reordered), Non-interruptible</p>										

Proposal 9235 - Observation 4 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 4: GJ3929b Eclipse 4 - Part 1</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI Imaging</p>										
Diagnostics	<p>(GJ3929b Eclipse 4 - Part 1 (Obs 4)) Warning (Form): Exposure Duration exceeds the limit of 10000.0 seconds. Above this limit it is possible that a High Gain Antenna move may occur during the exposure.</p> <p>(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>										
Fixed Targets	#	Name	Target Coordinates		Targ. Coord. Corrections			Miscellaneous			
	(1)	GJ3929	RA: 15 58 18.6104 (239.5775433d) Dec: +35 24 29.37 (35.40816d) Equinox: J2000		Proper Motion RA: -143.05937540596338 mas/yr Proper Motion Dec: 318.11994811695337 mas/yr Parallax: 0.06317265565406137" Epoch of Position: 2016.0						
	<p><i>Comments: Object has been updated manually with Gaia DR3 coordinates, proper motions, parallax, and epoch. Done by M. Alam, checked by T. Baines.</i></p> <p><i>Category=Star</i></p> <p><i>Description=[M dwarfs]</i></p> <p><i>Extended=NO</i></p>										
Template	<p>Subarray</p> <p>SUB128</p>										
Spectral Elements	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F1500W	FASTR1	47	2980	1	None	1	2980	17027.363	242464
Special Requirements	<p>Between Dates 10-FEB-2026:08:50:00 and 10-FEB-2026:09:50:00</p> <p>Phase 0.9257229 to 0.9416505 with period 2.6162644 Days and zero-phase 2460789.0447950 HJD</p> <p>Time Series Observation</p> <p>No Parallel Attachments</p> <p>Sequence Observations 3, 4 within 700 Days</p> <p>Sequence Observations 404, 4, 5 (reordered), Non-interruptible</p>										

Proposal 9235 - Observation 5 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 5: GJ3929b Eclipse 4 - Part 2</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI Imaging</p>										
Diagnostics	(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(1)	GJ3929	RA: 15 58 18.6104 (239.5775433d) Dec: +35 24 29.37 (35.40816d) Equinox: J2000			Proper Motion RA: -143.05937540596338 mas/yr Proper Motion Dec: 318.11994811695337 mas/yr Parallax: 0.06317265565406137" Epoch of Position: 2016.0					
	<i>Comments: Object has been updated manually with Gaia DR3 coordinates, proper motions, parallax, and epoch. Done by M. Alam, checked by T. Baines.</i> Category=Star Description=[M dwarfs] Extended=NO										
Template	<p>Subarray</p> <p>SUB128</p>										
Spectral Elements	#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	F1500W	FASTR1	47	1637	1	None	1	1637	9353.568	242464
Special Requirements	<p>Time Series Observation No Parallel Attachments</p> <p>Sequence Observations 404, 4, 5 (reordered), Non-interruptible</p>										

Proposal 9235 - Observation 101 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 101: Pre-Slew for Eclipse 1</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI External Flat</p>													
Diagnostics	(Visit 101:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.													
Template	Pointing Type	Detector	Dither		Lamp Use		Lamp On Time		Imager Subarray		Grating Wheel Direction			
	PRIME	IMAGER	false		OFF ONLY		0		SUB128		Allow Auto Reorder			
Spectral Elements	#	Detector	MRS Subarray	Filter	Wavelength 1 & 4	Wavelength 2 & 3	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	IMAGER		P750L			FASTR1	4	1	1	1	1	0.476	
Special Requirements	<p>No Parallel Attachments</p> <p>Sequence Observations 101, 1 (reordered), Non-interruptible</p>													

Proposal 9235 - Observation 202 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 202: Pre-Slew for Eclipse 2</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI External Flat</p>													
Diagnostics	(Visit 202:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.													
Template	Pointing Type	Detector	Dither		Lamp Use		Lamp On Time		Imager Subarray		Grating Wheel Direction			
	PRIME	IMAGER	false		OFF ONLY		0		SUB128		Allow Auto Reorder			
Spectral Elements	#	Detector	MRS Subarray	Filter	Wavelength 1 & 4	Wavelength 2 & 3	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	IMAGER		P750L			FASTR1	4	1	1	1	1	0.476	
Special Requirements	<p>No Parallel Attachments</p> <p>Sequence Observations 202, 2 (reordered), Non-interruptible</p>													

Proposal 9235 - Observation 303 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 303: Pre-Slew for Eclipse 3</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI External Flat</p>													
Diagnostics	(Visit 303:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.													
Template	Pointing Type	Detector	Dither		Lamp Use		Lamp On Time		Imager Subarray		Grating Wheel Direction			
	PRIME	IMAGER	false		OFF ONLY		0		SUB128		Allow Auto Reorder			
Spectral Elements	#	Detector	MRS Subarray	Filter	Wavelength 1 & 4	Wavelength 2 & 3	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	IMAGER		P750L			FASTR1	4	1	1	1	1	0.476	
Special Requirements	<p>No Parallel Attachments</p> <p>Sequence Observations 303, 3 (reordered), Non-interruptible</p>													

Proposal 9235 - Observation 404 - Rocky Worlds DDT: JWST Observations of GJ 3929 b

Fri Jan 23 01:00:15 GMT 2026

Observation	<p>Proposal 9235, Observation 404: Pre-Slew for Eclipse 4</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: MIRI External Flat</p>													
Diagnostics	(Visit 404:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.													
Template	Pointing Type	Detector	Dither		Lamp Use		Lamp On Time		Imager Subarray		Grating Wheel Direction			
	PRIME	IMAGER	false		OFF ONLY		0		SUB128		Allow Auto Reorder			
Spectral Elements	#	Detector	MRS Subarray	Filter	Wavelength 1 & 4	Wavelength 2 & 3	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
	1	IMAGER		P750L			FASTR1	4	1	1	1	1	0.476	
Special Requirements	<p>No Parallel Attachments</p> <p>Sequence Observations 404, 4, 5 (reordered), Non-interruptible</p>													