



1981 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-Dwarf Planet Atmospheres

Cycle: 1, Proposal Category: GO

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
WOLF 437b				
	11	Visit 1	NIRSpec Bright Object Time Series	(1) WOLF-437
	12	Visit 2	NIRSpec Bright Object Time Series	(1) WOLF-437
GJ 1132b				
	21	Visit 1	NIRSpec Bright Object Time Series	(2) GJ-1132
	22	Visit 2	NIRSpec Bright Object Time Series	(2) GJ-1132
GJ-341b				
	31	Visit 1	NIRCam Grism Time Series	(3) GJ-341
	32	Visit 2	NIRCam Grism Time Series	(3) GJ-341
	33	Visit 3	NIRCam Grism Time Series	(3) GJ-341
GJ 4102b				
	41	Visit 1	NIRSpec Bright Object Time Series	(4) GJ-4102
	42	Visit 2	NIRSpec Bright Object Time Series	(4) GJ-4102
	43	Visit 3	NIRSpec Bright Object Time Series	(4) GJ-4102
TRAPPIST-1h				
	51	Visit 1	NIRSpec Bright Object Time Series	(5) TRAPPIST-1
	52	Visit 2	NIRSpec Bright Object Time Series	(5) TRAPPIST-1
	53	Visit 3	NIRSpec Bright Object Time Series	(5) TRAPPIST-1

ABSTRACT

One of JWST's four pillars of science points to finding the building blocks of life elsewhere in the universe. Planets orbiting M-dwarf stars represent our best (and only) opportunity to measure the spectrum of a potentially-habitable planet in the next decade. The quest towards habitability begins with a simple question: Does this planet have an atmosphere? Whether or not terrestrial M-dwarf planets can retain their atmospheres is a hotly debated topic and only a large observational campaign acquiring exoplanet transmission spectra can provide unequivocal evidence of atmospheres. Understanding which M-dwarf planets have atmospheres will focus future theoretical efforts and could provide the first evidence of a "cosmic shoreline", a universal division between planets with and without substantial atmospheres. Even the population of planets with tenuous atmospheres will inform us about atmospheric escape processes.

In this study, we will obtain transmission spectra of nine terrestrial planets orbiting the nearest M dwarfs using instrument modes that are sensitive to

CO₂ at 4.3 microns and CH₄ at 3.3 microns, the strongest such features in JWST's wavelength range. Upon successful completion of this campaign, we will know which transiting M-dwarf planets within 15 parsecs have atmospheres and, of those that do, the fundamental diversity in their basic atmospheric compositions. We will know how the presence of an atmosphere correlates with planet irradiation and escape velocity, and how the evolutionary history of M dwarfs shapes the atmospheres of the planets that orbit them. Ultimately, this study will generate new sparks of life in M-dwarf planet research.

OBSERVING DESCRIPTION

We will perform time-series observations of five terrestrial exoplanets orbiting the nearest M dwarfs to determine which planets have atmospheres and, of those that do, the fundamental diversity in their basic atmospheric composition.

The fundamental parameter that determines the length of our time-series observations is the transit duration. Additionally, for each visit, we will require a few hours of baseline both before and after the transit to identify and effectively model any instrument systematics. We compute the exposure times, phase constraints, and signal-to-noise ratio (SNR) for each observation based on the JWST ETC, ExoCTK, and PandExo estimates. We require a total of 76 hours (including overheads) for the given primary targets. Below we provide details of each observation.

WOLF 347b: 2 transits, NIRSpec/G395

GJ 1132b: 2 transits, NIRSpec/G395

GJ 341b: 3 transits, NIRCам/F444W, PA constraints

GJ 4102b: 3 transits, NIRSpec/G395

TRAPPIST-1h: 3 transits, NIRSpec/PRISM, avoid multi-planet transits

All of the NIRSpec/G395H targets are too bright for TA and rely on a faint, nearby companion to avoid saturation. GJ 341 has PA constraints to avoid contamination from nearby targets. We will avoid TRAPPIST-1h transits that overlap with transits from other planets within the same system. The Visit Planner shows that there is a sufficient number of transit opportunities available for each target.

Proposal 1981 - Targets - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-Dwarf Pla...

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	WOLF-437	RA: 12 47 55.5675 (191.9815313d) Dec: +09 44 57.91 (9.74942d) Equinox: J2000	Proper Motion RA: -0.06822546051816196 sec of time/yr Proper Motion Dec: -0.45979999993051024 arcsec/yr Epoch of Position: 2015.5	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]				
	(2)	GJ-1132	RA: 10 14 50.1767 (153.7090696d) Dec: -47 09 17.77 (-47.15494d) Equinox: J2000	Proper Motion RA: -0.10332851021288136 sec of time/yr Proper Motion Dec: 0.4143 arcsec/yr Epoch of Position: 2015.5	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]				
	(3)	GJ-341	RA: 09 21 35.8504 (140.3993767d) Dec: -60 16 52.21 (-60.28117d) Equinox: J2000	Proper Motion RA: -0.11297682918319278 sec of time/yr Proper Motion Dec: 0.18209 arcsec/yr Epoch of Position: 2015.5	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]				
	(4)	GJ-4102	RA: 19 20 57.1076 (290.2379483d) Dec: -82 33 35.24 (-82.55979d) Equinox: J2000	Proper Motion RA: 0.1761679932340912 sec of time/yr Proper Motion Dec: -1.2302199999567165 arcsec/yr Epoch of Position: 2015.5	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]				
	(5)	TRAPPIST-1	RA: 23 06 30.3341 (346.6263921d) Dec: -05 02 36.46 (-5.04346d) Equinox: J2000	Proper Motion RA: 0.062299806210057845 sec of time/yr Proper Motion Dec: -0.479402999985723 arcsec/yr Epoch of Position: 2015.5	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]				
	(11)	WOLF437-TARGETAQ-OPTION1	RA: 12 47 50.8779 (191.9619912d) Dec: +09 45 39.47 (9.76096d) Equinox: J2000	Proper Motion RA: -4.221782721885151E-4 sec of time/yr Proper Motion Dec: -0.004376999959276873 arcsec/yr Epoch of Position: 2015.5	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]				
	(12)	WOLF437-TARGETAQ-OPTION2	RA: 12 48 0.4697 (192.0019571d) Dec: +09 45 9.17 (9.75255d) Equinox: J2000		
	Comments: This object was generated by the targetselector and retrieved from the 2MASS database. Category=Unidentified Description=[Infrared sources]				

Proposal 1981 - Targets - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-Dwarf Pla...

(21) GJ1132-TARGETAQ RA: 10 14 47.5083 (153.6979512d) Dec: -47 08 56.17 (-47.14894d) Equinox: J2000	Proper Motion RA: -0.007 arcsec/yr Proper Motion Dec: 0.007931 arcsec/yr Epoch of Position: 2015.5
<p><i>Comments: This object was generated by the targetselector and retrieved from the 2MASS database.</i></p> <p><i>K=14.089</i> <i>J = 14.356</i></p> <p><i>I recommend NRSRAPIDD6 with F140X for SNR~150.</i> <i>Category=Unidentified</i> <i>Description=[Infrared sources, Visible sources]</i></p>	
(41) GJ-4102-TARGETAQ RA: 19 21 4.4901 (290.2687087d) Dec: -82 33 2.09 (-82.55058d) Equinox: J2000	Proper Motion RA: -17.178 mas/yr Proper Motion Dec: 12.029 mas/yr Epoch of Position: 2015.5
<p><i>Comments: Fairly high proper motions but not moving out of the FoV any time soon.</i> <i>Distance from target = 24.3"</i> <i>2MASS 19210447-8233020</i> <i>Jmag = 15.5</i></p> <p><i>https://vizier.u-strasbg.fr/viz-bin/VizieR-5?-ref=VIZ5fb7e5325c20&-out.add=.&-source=II/246/out&2MASS===19210447-8233020</i></p> <p><i>Gaia DR2 6347643492312233856</i> <i>https://vizier.u-strasbg.fr/viz-bin/VizieR-5?-ref=VIZ5fb7e5325c20&-out.add=.&-source=I/345/gaia2&-c=290.26813836944%20-82.55052996389,eq=ICRS,rs=2&-out.orig=o</i></p> <p><i>Instrument set-up:</i> <i>WATA, CLEAR, SUB32, NRSRAPID</i> <i>Category=Unidentified</i> <i>Description=[Infrared sources, Visible sources]</i></p>	

Proposal 1981 - Observation 11 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 11: Visit 1										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 1 (Obs 11)) 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.										
	(Visit 1 (Obs 11)) Warning (Form): The slew between the acquisition exposure and the farthest science exposure is 80.830 Arcsec (larger than the recommended limit of 38.000 Arcsec) and may result in reduced or no schedulability. See more information in the diagnostic browser.										
	(Visit 11:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(1)	WOLF-437	RA: 12 47 55.5675 (191.9815313d) Dec: +09 44 57.91 (9.74942d) Equinox: J2000			Proper Motion RA: -0.06822546051816196 sec of time/yr Proper Motion Dec: -0.45979999993051024 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Category=Unidentified Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	11 WOLF437-TARGETAQ-OPTION1	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	3	3507	1	1	3507	12725.079	76169	
Special Requirements	Phase 0.9288 to 0.9572 with period 1.4671 Days and zero-phase 2458928.2252 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 12 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 12: Visit 2										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 2 (Obs 12)) 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.										
	(Visit 2 (Obs 12)) Warning (Form): The slew between the acquisition exposure and the farthest science exposure is 80.830 Arcsec (larger than the recommended limit of 38.000 Arcsec) and may result in reduced or no schedulability. See more information in the diagnostic browser.										
	(Visit 12:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(1)	WOLF-437	RA: 12 47 55.5675 (191.9815313d) Dec: +09 44 57.91 (9.74942d) Equinox: J2000			Proper Motion RA: -0.06822546051816196 sec of time/yr Proper Motion Dec: -0.45979999993051024 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified										
Acquisition	Description=[Infrared sources, Visible sources]										
	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	11 WOLF437-TARGETAQ-OPTION1	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	3	3507	1	1	3507	12725.079	76169	
Special Requirements	Phase 0.9288 to 0.9572 with period 1.4671 Days and zero-phase 2458928.2252 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 21 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 21: Visit 1										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 1 (Obs 21)) 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.										
	(Visit 21:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(2)	GJ-1132	RA: 10 14 50.1767 (153.7090696d) Dec: -47 09 17.77 (-47.15494d) Equinox: J2000			Proper Motion RA: -0.10332851021288136 sec of time/yr Proper Motion Dec: 0.4143 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	21 GJ1132-TARGETAQ	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	16	718	1	1	718	11024.517	76169	
Special Requirements	Phase 0.9200 to 0.9455 with period 1.6289 Days and zero-phase 2457184.5576 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 22 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 22: Visit 2										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 2 (Obs 22)) 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.										
	(Visit 22:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(2)	GJ-1132	RA: 10 14 50.1767 (153.7090696d) Dec: -47 09 17.77 (-47.15494d) Equinox: J2000			Proper Motion RA: -0.10332851021288136 sec of time/yr Proper Motion Dec: 0.4143 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	21 GJ1132-TARGETAQ	WATA	SUB32	F140X	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	16	718	1	1	718	11024.517	76169	
Special Requirements	Phase 0.9200 to 0.9455 with period 1.6289 Days and zero-phase 2457184.5576 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 31 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 31: Visit 1									Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning									
Observing Template: NIRCcam Grism Time Series										
Diagnostics	(Visit 1 (Obs 31)) 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.									
	(Visit 31:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.									
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous	
	(3)	GJ-341	RA: 09 21 35.8504 (140.3993767d) Dec: -60 16 52.21 (-60.28117d) Equinox: J2000			Proper Motion RA: -0.11297682918319278 sec of time/yr Proper Motion Dec: 0.18209 arcsec/yr Epoch of Position: 2015.5				
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
Category=Unidentified										
Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	SAME	SUB32TATSGRISM	F405N+F444W	RAPID	3	1	1	0.062	76169
Template	Subarray					No. of Output Channels				
	SUBGRISM128					4				
Spectral Elements	#	Short Pupil+Filter	Long Pupil+Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	WLP8+F212N	GRISMR+F444W	BRIGHT1	3	4652	1	4652	18891.493	76169
Special Requirements	Phase 0.9815 to 0.9870 with period 7.5763 Days and zero-phase 2458544.0874 HJD									
	Aperture PA Range 5 to 35 Degrees (V3 5.30737728 to 35.30737728) Aperture PA Range 75 to 110 Degrees (V3 75.30737728 to 110.30737728) Aperture PA Range 135 to 175 Degrees (V3 135.30737728 to 175.30737728) Aperture PA Range 185 to 215 Degrees (V3 185.30737728 to 215.30737728) Aperture PA Range 255 to 290 Degrees (V3 255.30737728 to 290.30737728) Aperture PA Range 315 to 355 Degrees (V3 315.30737728 to 355.30737728) Time Series Observation No Parallel									

Proposal 1981 - Observation 32 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 32: Visit 2									Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning									
	Observing Template: NIRCam Grism Time Series									
Diagnostics	(Visit 2 (Obs 32)) 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.									
	(Visit 32:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.									
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous	
	(3)	GJ-341	RA: 09 21 35.8504 (140.3993767d) Dec: -60 16 52.21 (-60.28117d) Equinox: J2000			Proper Motion RA: -0.11297682918319278 sec of time/yr Proper Motion Dec: 0.18209 arcsec/yr Epoch of Position: 2015.5				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
	Category=Unidentified Description=[Infrared sources, Visible sources]									
Acquisition	#	Target	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	SAME	SUB32TATSGRIS M	F405N+F444W	RAPID	3	1	1	0.062	76169
Template	Subarray					No. of Output Channels				
	SUBGRISM128					4				
Spectral Elements	#	Short Pupil+Filter	Long Pupil+Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	WLP8+F212N	GRISMR+F444W	BRIGHT1	3	4652	1	4652	18891.493	76169
Special Requirements	Phase 0.9815 to 0.9870 with period 7.5763 Days and zero-phase 2458544.0874 HJD									
	Aperture PA Range 5 to 35 Degrees (V3 5.30737728 to 35.30737728) Aperture PA Range 75 to 110 Degrees (V3 75.30737728 to 110.30737728) Aperture PA Range 135 to 175 Degrees (V3 135.30737728 to 175.30737728) Aperture PA Range 185 to 215 Degrees (V3 185.30737728 to 215.30737728) Aperture PA Range 255 to 290 Degrees (V3 255.30737728 to 290.30737728) Aperture PA Range 315 to 355 Degrees (V3 315.30737728 to 355.30737728) Time Series Observation No Parallel									

Proposal 1981 - Observation 33 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 33: Visit 3									Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning									
Observing Template: NIRCam Grism Time Series										
Diagnostics	(Visit 3 (Obs 33)) 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.									
	(Visit 33:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.									
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous	
	(3)	GJ-341	RA: 09 21 35.8504 (140.3993767d) Dec: -60 16 52.21 (-60.28117d) Equinox: J2000			Proper Motion RA: -0.11297682918319278 sec of time/yr Proper Motion Dec: 0.18209 arcsec/yr Epoch of Position: 2015.5				
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
	Category=Unidentified Description=[Infrared sources, Visible sources]									
Acquisition	#	Target	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	SAME	SUB32TATSGRIS M	F405N+F444W	RAPID	3	1	1	0.062	76169
Template	Subarray					No. of Output Channels				
	SUBGRISM128					4				
Spectral Elements	#	Short Pupil+Filter	Long Pupil+Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	WLP8+F212N	GRISMR+F444W	BRIGHT1	3	4652	1	4652	18891.493	76169
Special Requirements	Phase 0.9815 to 0.9870 with period 7.5763 Days and zero-phase 2458544.0874 HJD Aperture PA Range 5 to 35 Degrees (V3 5.30737728 to 35.30737728) Aperture PA Range 75 to 110 Degrees (V3 75.30737728 to 110.30737728) Aperture PA Range 135 to 175 Degrees (V3 135.30737728 to 175.30737728) Aperture PA Range 185 to 215 Degrees (V3 185.30737728 to 215.30737728) Aperture PA Range 255 to 290 Degrees (V3 255.30737728 to 290.30737728) Aperture PA Range 315 to 355 Degrees (V3 315.30737728 to 355.30737728) Time Series Observation No Parallel									

Proposal 1981 - Observation 41 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 41: Visit 1										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 1 (Obs 41)) 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.										
	(Visit 41:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(4)	GJ-4102	RA: 19 20 57.1076 (290.2379483d) Dec: -82 33 35.24 (-82.55979d) Equinox: J2000			Proper Motion RA: 0.1761679932340912 sec of time/yr Proper Motion Dec: -1.2302199999567165 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	41 GJ-4102-TARGETAQ	WATA	SUB32	CLEAR	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	9	1158	1	1	1158	10468.876	76169	
Special Requirements	Phase 0.9548 to 0.9754 with period 2.029 Days and zero-phase 2458626.2055 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 42 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 42: Visit 2										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 2 (Obs 42)) 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.										
	(Visit 42:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(4)	GJ-4102	RA: 19 20 57.1076 (290.2379483d) Dec: -82 33 35.24 (-82.55979d) Equinox: J2000			Proper Motion RA: 0.1761679932340912 sec of time/yr Proper Motion Dec: -1.2302199999567165 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	41 GJ-4102-TARGETAQ	WATA	SUB32	CLEAR	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	9	1158	1	1	1158	10468.876	76169	
Special Requirements	Phase 0.9548 to 0.9754 with period 2.029 Days and zero-phase 2458626.2055 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 43 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 43: Visit 3										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 3 (Obs 43)) 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.										
	(Visit 43:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(4)	GJ-4102	RA: 19 20 57.1076 (290.2379483d) Dec: -82 33 35.24 (-82.55979d) Equinox: J2000			Proper Motion RA: 0.1761679932340912 sec of time/yr Proper Motion Dec: -1.2302199999567165 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	41 GJ-4102-TARGETAQ	WATA	SUB32	CLEAR	NRSRAPIDD6	3	1	1	0.26	76169
Template	Subarray										
	SUB2048										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	G395H/F290LP	NRSRAPID	9	1158	1	1	1158	10468.876	76169	
Special Requirements	Phase 0.9548 to 0.9754 with period 2.029 Days and zero-phase 2458626.2055 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 51 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 51: Visit 1										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSspec Bright Object Time Series										
Diagnostics	(Visit 1 (Obs 51)) 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.										
	(Visit 51:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(5)	TRAPPIST-1	RA: 23 06 30.3341 (346.6263921d) Dec: -05 02 36.46 (-5.04346d) Equinox: J2000			Proper Motion RA: 0.062299806210057845 sec of time/yr Proper Motion Dec: -0.479402999985723 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified										
	Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	5 TRAPPIST-1	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	76169
Template	Subarray										
	SUB512										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	PRISM/CLEAR	NRSRAPID	5	10550	1	1	10550	14531.992	76169	
Special Requirements	Phase 0.9939 to 0.9961 with period 18.772866 Days and zero-phase 2457249.60676 HJD Time Series Observation No Parallel										

Proposal 1981 - Observation 52 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 52: Visit 2										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 2 (Obs 52)) 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.										
	(Visit 52:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(5)	TRAPPIST-1	RA: 23 06 30.3341 (346.6263921d) Dec: -05 02 36.46 (-5.04346d) Equinox: J2000			Proper Motion RA: 0.062299806210057845 sec of time/yr Proper Motion Dec: -0.479402999985723 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified										
Acquisition	Description=[Infrared sources, Visible sources]										
	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	5 TRAPPIST-1	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	76169
Template	Subarray										
	SUB512										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	PRISM/CLEAR	NRSRAPID	5	10550	1	1	10550	14531.992	76169	
	Special Requirements	Phase 0.9939 to 0.9961 with period 18.767 Days and zero-phase 2457662.5528 HJD									
Time Series Observation											
	No Parallel										

Proposal 1981 - Observation 53 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 53: Visit 3										Mon Jul 19 23:00:59 GMT 2021
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 3 (Obs 53)) 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.										
	(Visit 53:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(5)	TRAPPIST-1	RA: 23 06 30.3341 (346.6263921d) Dec: -05 02 36.46 (-5.04346d) Equinox: J2000			Proper Motion RA: 0.062299806210057845 sec of time/yr Proper Motion Dec: -0.479402999985723 arcsec/yr Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Category=Unidentified										
	Description=[Infrared sources, Visible sources]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	5 TRAPPIST-1	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	76169
Template	Subarray										
	SUB512										
Spectral Elements	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID	
	1	PRISM/CLEAR	NRSRAPID	5	10550	1	1	10550	14531.992	76169	
Special Requirements	Phase 0.9939 to 0.9961 with period 18.767 Days and zero-phase 2457662.5528 HJD Time Series Observation No Parallel										