



# 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

## INVESTIGATORS

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**OBSERVATIONS**

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
GJ 4102b				
	41	Visit 1	NIRSpec Bright Object Time Series	(4) GJ-4102
	42	Visit 2	NIRSpec Bright Object Time Series	(4) GJ-4102
	44	Visit 4	NIRSpec Bright Object Time Series	(4) GJ-4102
	45	Visit 5	NIRSpec Bright Object Time Series	(14) GJ-4102A
	43	Visit 3	NIRSpec Bright Object Time Series	(4) GJ-4102
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
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 CO<sub>2</sub> at 4.3 microns and CH<sub>4</sub> 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...

(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]*

(14) GJ-4102A RA: 19 20 57.1077 (290.2379487d) Proper Motion RA: 0.17622771481353314 sec of  
Dec: -82 33 35.24 (-82.55979d) time/yr  
Equinox: J2000 Proper Motion Dec: -1.23029700009738 arcsec/yr  
Parallax: 0.0801134"  
Epoch of Position: 2015.5

*Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.*

*Added Parallax per Tony's suggestion*  
*Category=Star*  
*Description=[M dwarfs]*

(21) GJ1132-TARGETAQ RA: 10 14 47.5083 (153.6979512d) Proper Motion RA: -0.007 arcsec/yr  
Dec: -47 08 56.17 (-47.14894d) Proper Motion Dec: 0.007931 arcsec/yr  
Equinox: J2000 Epoch of Position: 2015.5

*Comments: This object was generated by the targetselector and retrieved from the 2MASS database.*

*K=14.089*  
*J = 14.356*

*I recommend NRSRAPIDD6 with F140X for SNR~150.*  
*Category=Unidentified*  
*Description=[Infrared sources, Visible sources]*

(41) GJ-4102-TARGETAQ RA: 19 21 4.4901 (290.2687087d) Proper Motion RA: -17.178 mas/yr  
Dec: -82 33 2.09 (-82.55058d) Proper Motion Dec: 12.029 mas/yr  
Equinox: J2000 Epoch of Position: 2015.5

*Comments: Fairly high proper motions but not moving out of the FoV any time soon.*  
*Distance from target = 24.3"*  
*2MASS 19210447-8233020*  
*Jmag = 15.5*

<https://vizier.u-strasbg.fr/viz-bin/VizieR?-ref=VIZ5fb7e5325c20&-out.add=.&-source=II/246/out&2MASS===19210447-8233020>

*Gaia DR2 6347643492312233856*  
<https://vizier.u-strasbg.fr/viz-bin/VizieR?-ref=VIZ5fb7e5325c20&-out.add=.&-source=I/345/gaia2&-c=290.26813836944%20-82.55052996389,eq=ICRS,rs=2&-out.orig=o>

*Instrument set-up:*  
*WATA, CLEAR, SUB32, NRSRAPID*  
*Category=Unidentified*  
*Description=[Infrared sources, Visible sources]*

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

(42)	GJ-4102-TARGETAQ-J2000	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: 2000.0
<p><i>Comments: Fairly high proper motions but not moving out of the FoV any time soon.</i></p> <p><i>Distance from target = 24.3"</i></p> <p><i>2MASS 19210447-8233020</i></p> <p><i>Jmag = 15.5</i></p> <p><i><a href="https://vizier.u-strasbg.fr/viz-bin/VizieR-5?-ref=VIZ5fb7e5325c20&amp;-out.add=.&amp;-source=II/246/out&amp;2MASS===19210447-8233020">https://vizier.u-strasbg.fr/viz-bin/VizieR-5?-ref=VIZ5fb7e5325c20&amp;-out.add=.&amp;-source=II/246/out&amp;2MASS===19210447-8233020</a></i></p> <p><i>Gaia DR2 6347643492312233856</i></p> <p><i><a href="https://vizier.u-strasbg.fr/viz-bin/VizieR-5?-ref=VIZ5fb7e5325c20&amp;-out.add=.&amp;-source=I/345/gaia2&amp;-c=290.26813836944%20-82.55052996389,eq=ICRS,rs=2&amp;-out.orig=o">https://vizier.u-strasbg.fr/viz-bin/VizieR-5?-ref=VIZ5fb7e5325c20&amp;-out.add=.&amp;-source=I/345/gaia2&amp;-c=290.26813836944%20-82.55052996389,eq=ICRS,rs=2&amp;-out.orig=o</a></i></p> <p><i>Instrument set-up:</i></p> <p><i>WATA, CLEAR, SUB32, NRSRAPID</i></p> <p><i>Category=Unidentified</i></p> <p><i>Description=[Infrared sources, Visible sources]</i></p>			

# 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										Wed Jan 18 23:01:25 GMT 2023
	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										
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	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 2.0290882 Days and zero-phase 2458626.20653 HJD Time Series Observation No Parallel Attachments										

# 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										Wed Jan 18 23:01:26 GMT 2023
	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 2.0290882 Days and zero-phase 2458626.20653 HJD Time Series Observation No Parallel Attachments										



# Proposal 1981 - Observation 44 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 44: Visit 4										Wed Jan 18 23:01:26 GMT 2023
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 4 (Obs 44)) 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 44:1) 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	1224	1	1	1224	11065.548	76169	
Special Requirements	Phase 0.9599 to 0.9804 with period 2.0290882 Days and zero-phase 2458626.20653 HJD Time Series Observation No Parallel Attachments										

# Proposal 1981 - Observation 45 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Observation	Proposal 1981, Observation 45: Visit 5										Wed Jan 18 23:01:26 GMT 2023
	Diagnostic Status: Warning										
	Observing Template: NIRSpec Bright Object Time Series										
Diagnostics	(Visit 5 (Obs 45)) 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 45:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(14)	GJ-4102A	RA: 19 20 57.1077 (290.2379487d) Dec: -82 33 35.24 (-82.55979d) Equinox: J2000			Proper Motion RA: 0.17622771481353314 sec of time/yr Proper Motion Dec: -1.23029700009738 arcsec/yr Parallax: 0.0801134" Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Added Parallax per Tony's suggestion										
	Category=Star Description=[M dwarfs]										
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	42 GJ-4102-TARGETAQ-J2000	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	1224	1	1	1224	11065.548	76169	

Proposal 1981 - Observation 45 - Tell Me How I'm Supposed To Breathe With No Air: Measuring the Prevalence and Diversity of M-D...

Special Requirements	Phase 0.9599 to 0.9804 with period 2.0290882 Days and zero-phase 2458626.20653 HJD Time Series Observation No Parallel Attachments
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# 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										Wed Jan 18 23:01:26 GMT 2023
	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										
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	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 2.0290882 Days and zero-phase 2458626.20653 HJD Time Series Observation No Parallel Attachments										

# 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										Wed Jan 18 23:01:26 GMT 2023
	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 76.153 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: -0.06820279992207054 sec of time/yr  Proper Motion Dec: -0.4600339999115022 arcsec/yr Parallax: 0.1237756" Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Added Parallax per Tony's suggestion										
	Category=Star Description=[M dwarfs] Extended=NO										
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	

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

Special Requirements	Phase 0.9356 to 0.9640 with period 1.4671214 Days and zero-phase 2459670.58857 HJD Time Series Observation No Parallel Attachments
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# 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										Wed Jan 18 23:01:26 GMT 2023
	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 76.153 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: -0.06820279992207054 sec of time/yr  Proper Motion Dec: -0.4600339999115022 arcsec/yr Parallax: 0.1237756" Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Added Parallax per Tony's suggestion										
	Category=Star Description=[M dwarfs] Extended=NO										
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	

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

Special Requirements	Phase 0.9356 to 0.9640 with period 1.4671214 Days and zero-phase 2459670.58857 HJD Time Series Observation No Parallel Attachments
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# 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										Wed Jan 18 23:01:26 GMT 2023
	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 50.1768 (153.7090700d) Dec: -47 09 17.77 (-47.15494d) Equinox: J2000			Proper Motion RA: -0.10335027422347062 sec of time/yr Proper Motion Dec: 0.414512 arcsec/yr Parallax: 0.0793206" Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	Added Parallax per Tony's suggestion										
	Category=Star Description=[M dwarfs]										
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	14	814	1	1	814	11030.091	134424	

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

Special Requirements	Phase 0.9480 to 0.9736 with period 1.6289287 Days and zero-phase 2457184.55759 HJD Time Series Observation No Parallel Attachments
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# 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										Wed Jan 18 23:01:26 GMT 2023
	Diagnostic Status: Warning										
	Observing Template: NIRSspec 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 50.1768 (153.7090700d) Dec: -47 09 17.77 (-47.15494d) Equinox: J2000			Proper Motion RA: -0.10335027422347062 sec of time/yr Proper Motion Dec: 0.414512 arcsec/yr Parallax: 0.0793206" Epoch of Position: 2015.5					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. Added Parallax per Tony's suggestion Category=Star Description=[M dwarfs]										
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	14	814	1	1	814	11030.091	134424	

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

Special Requirements	Phase 0.9480 to 0.9736 with period 1.6289287 Days and zero-phase 2457184.55759 HJD Time Series Observation No Parallel Attachments
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# 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									Wed Jan 18 23:01:26 GMT 2023	
	Diagnostic Status: Warning										
	Observing Template: NIRCam 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=Star Description=[M dwarfs]										
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 0.9828 to 0.9883 with period 7.5768707 Days and zero-phase 2458544.0874 HJD Aperture PA Range 5 to 35 Degrees (V3 5.36622083 to 35.36622083) Aperture PA Range 75 to 110 Degrees (V3 75.36622083 to 110.36622083) Aperture PA Range 135 to 175 Degrees (V3 135.36622083 to 175.36622083) Aperture PA Range 185 to 215 Degrees (V3 185.36622083 to 215.36622083) Aperture PA Range 255 to 290 Degrees (V3 255.36622083 to 290.36622083) Aperture PA Range 315 to 355 Degrees (V3 315.36622083 to 355.36622083) Time Series Observation No Parallel Attachments										

# 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									Wed Jan 18 23:01:26 GMT 2023
	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=Star Description=[M dwarfs]									
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 0.9828 to 0.9883 with period 7.5768707 Days and zero-phase 2458544.0874 HJD Aperture PA Range 5 to 35 Degrees (V3 5.36622083 to 35.36622083) Aperture PA Range 75 to 110 Degrees (V3 75.36622083 to 110.36622083) Aperture PA Range 135 to 175 Degrees (V3 135.36622083 to 175.36622083) Aperture PA Range 185 to 215 Degrees (V3 185.36622083 to 215.36622083) Aperture PA Range 255 to 290 Degrees (V3 255.36622083 to 290.36622083) Aperture PA Range 315 to 355 Degrees (V3 315.36622083 to 355.36622083) Time Series Observation No Parallel Attachments									

# 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									Wed Jan 18 23:01:26 GMT 2023
	Diagnostic Status: Warning									
	Observing Template: NIRCcam 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=Star Description=[M dwarfs]									
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 0.9828 to 0.9883 with period 7.5768707 Days and zero-phase 2458544.0874 HJD Aperture PA Range 5 to 35 Degrees (V3 5.36622083 to 35.36622083) Aperture PA Range 75 to 110 Degrees (V3 75.36622083 to 110.36622083) Aperture PA Range 135 to 175 Degrees (V3 135.36622083 to 175.36622083) Aperture PA Range 185 to 215 Degrees (V3 185.36622083 to 215.36622083) Aperture PA Range 255 to 290 Degrees (V3 255.36622083 to 290.36622083) Aperture PA Range 315 to 355 Degrees (V3 315.36622083 to 355.36622083) Time Series Observation No Parallel Attachments									

# 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										Wed Jan 18 23:01:26 GMT 2023
	Diagnostic Status: Warning										
	Observing Template: NIRSpec 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=Star										
	Description=[M dwarfs]										
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	Before Date 01-JAN-2024:00:00:00 Phase 0.9944 to 0.9966 with period 18.765 Days and zero-phase 2459877.02238 HJD Time Series Observation No Parallel Attachments										



# 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										Wed Jan 18 23:01:26 GMT 2023	
	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=Star											
	Description=[M dwarfs]											
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	Before Date 01-JAN-2024:00:00:00 Phase 0.9944 to 0.9966 with period 18.765 Days and zero-phase 2459877.02238 HJD Time Series Observation No Parallel Attachments											

# 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										Wed Jan 18 23:01:26 GMT 2023
	Diagnostic Status: Warning										
Observing Template: NIRSspec 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=Star											
Description=[M dwarfs]											
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	Before Date 01-JAN-2024:00:00:00 Phase 0.9944 to 0.9966 with period 18.765 Days and zero-phase 2459877.02238 HJD Time Series Observation No Parallel Attachments										