



# 9101 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Cycle: 4, Proposal Category: GO

## INVESTIGATORS

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<b>Dr. Michael Radica (PI)</b>	<b>University of Chicago</b>
Dr. Caroline Piaulet Ghorayeb (CoI) (CoPI)	University of Chicago
Prof. Jacob L. Bean (CoI) (US Admin CoI)	University of Chicago
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Dr. Peter Gao (CoI)	Carnegie Institution of Washington
Dr. Luis Welbanks (CoI)	Arizona State University
Dr. Michael Line (CoI)	Arizona State University

## OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
WASP-127 b Transit				
	1	MIRI LRS Transit	MIRI Low Resolution Spectroscopy	(1) WASP-127
WASP-193 b Transits				
	2	MIRI LRS Transit	MIRI Low Resolution Spectroscopy	(2) WASP-193
	3	NIRSpec G395M Transit	NIRSpec Bright Object Time Series	(2) WASP-193
	4	NIRSpec G235M Transit	NIRSpec Bright Object Time Series	(2) WASP-193
	5	NIRSpec G140H Transit	NIRSpec Bright Object Time Series	(2) WASP-193
TOI-1420 b Transits				

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
	6	MIRI LRS Transit	MIRI Low Resolution Spectroscopy	(3) TOI-1420
	7	NIRSpec G395M Transit	NIRSpec Bright Object Time Series	(3) TOI-1420
	8	NIRISS SOSS Transit	NIRISS Single-Object Slitless Spectroscopy	(3) TOI-1420

## **ABSTRACT**

With Neptune-like masses but Saturn-like radii, super-puffs present a fantastic opportunity for spectroscopic characterization. These planets challenge conventional formation models, with their abnormally large radii suggesting that they are inflated by high internal temperatures or aerosols. To unravel the origins of super-puffs, we propose a comprehensive panchromatic survey of the atmospheres of the four most observable super-puffs: WASP-107b, WASP-127b, WASP-193b, and TOI-1420b using JWST NIRISS, NIRSpec, and MIRI.

By acquiring transmission spectra across a wide wavelength range (0.6-12  $\mu\text{m}$ ), we will (1) precisely characterize the chemical inventories of these super-puffs, with measurements of their metallicities and elemental ratios, (2) interpret these measurements in terms of the processes shaping the atmospheres, including internal heating, photochemistry and vertical mixing, and (3) assess the role of aerosols on their inflated radii. Primarily, this program aims to address whether the inflated radii of super-puffs are driven by high internal temperatures or the presence of photochemically-produced hazes. In addition, by observing optimal targets with a wide range of planet masses and equilibrium temperatures, we will also probe temperature- and mass-dependent trends in elemental ratios, aerosol production and coverage, as well as the importance of photochemistry, which will all impact our understanding of giant planets more generally. With our proposed observations, we will double the current sample of super-puffs with high-precision JWST observations and provide a pristine set of panchromatic transmission spectra that will serve as benchmarks for the community.

## **OBSERVING DESCRIPTION**

This program will construct panchromatic transmission spectra of the most observable super puff planets.

WASP-107b already has JWST observations spanning 0.6-12 $\mu\text{m}$ , and so we do not need any additional observations for this target.

WASP-127b already has NIRISS/SOSS and NIRSpec/G395H observations, and we require an additional transit with MIRI/LRS to complete the necessary wavelength coverage. We use 45 groups per integration and 2\*2640 integrations. Additionally, the visit is broken up into two exposures to remain below the maximum frame rate. We time the exposure break to occur a minimum of 1 hr after second contact. Target selection is performed on the target itself. We provide PA ranges in the APT to avoid detector contamination from several nearby sources and also include an additional 45

minutes of baseline before transit to account for the MIRI detector settling time.

For TOI-1420b, we require observations across the full 0.6-12 $\mu$ m range. We accomplish this using a combination of NIRISS/SOSS, NIRSpec/G395M, and MIRI/LRS.

For NIRISS, we use 4 groups per integration and a total of 390 integrations. We specify tight PA constraints to avoid contamination from a crowded field.

For NIRSpec, we use 30 groups and 977 integrations. We choose the M grating over H to be potentially sensitive to H<sub>2</sub>S, (an important constituent of S chemistry) which would otherwise fall in the detector gap. We perform TA on the target itself. One pixel saturates during TA, though this should not negatively affect TA performance. We link the NIRISS and NIRSpec observations to capture subsequent transits of TOI-1420b, such that we jointly model the potential impacts of the TLSE from the K-type host star on the atmosphere spectra.

Each of these two observations assumes a total observing time of  $2 \times T_{14} + 1 \text{ hr}$ .

For MIRI, we use 75 groups and 2520 integrations. As for WASP-127b, we add PA constraints to limit contamination of the detector as well as an additional 45 mins of baseline to account for detector settling. We perform the TA on the target.

For TOI-193b, we require observations across the full 0.6-12 $\mu$ m range. However, the level of field star contamination is too high for this target to be observed with NIRISS. As such, we use all three of the G140, G235, and G395M NIRSpec gratings as well as MIRI/LRS to create the same wavelength coverage.

For NIRSpec, we use 10 groups and 3513 integrations for G140M, 24 and 1547 for G235M, and 54 and 703 for G395M. Again, we choose the M gratings for sensitivity to H<sub>2</sub>S, as well as to not worry about the three additional offsets that would need to be modelling due to detector gaps for each grating. TA is performed on the target. Total observation time of  $2 \times T_{14} + 1 \text{ hr}$  assumed for all visits.

For MIRI, we use 75 groups and  $2 \times 1576$  integrations, again breaking up the visit into two exposures (timing the break to occur away from second contact). Again, we add an additional 45 mins of pre transit baseline and add tight PA ranges to limit field star contamination.

Nine warnings remain in the APT. Eight concern HGA moves for each observation. These are acceptable and expected for exoplanet TSOs, and there is no evidence that HGA moves adversely affect data quality.

The final warning concerns the planning windows for the WASP-189b MIRI transit falling within the meteoroid avoidance zone. This is due to a combination of the restricted visibility windows and the tight PA constraints necessary to avoid contamination from a close companion. There is no way to relax the PA constraints as this would result in the spectra being entirely contaminated and unusable for science.

# Proposal 9101 - Targets - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	WASP-127	RA: 10 42 14.0837 (160.5586821d) Dec: -03 50 6.26 (-3.83507d) Equinox: J2000	Proper Motion RA: 19.133 mas/yr Proper Motion Dec: 17.058 mas/yr Parallax: 0.0062241" Epoch of Position: 2000	
<p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i></p> <p><i>SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.</i></p> <p><i>Category=Star</i> <i>Description=[Exoplanet Systems]</i> <i>Extended=NO</i></p>				
(2)	WASP-193	RA: 10 57 23.8522 (164.3493842d) Dec: -29 59 49.67 (-29.99713d) Equinox: J2000	Proper Motion RA: -49.055 mas/yr Proper Motion Dec: 1.506 mas/yr Parallax: 0.0026475" Epoch of Position: 2000	
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(3)	TOI-1420	RA: 21 31 45.9171 (322.9413212d) Dec: +66 20 55.93 (66.34887d) Equinox: J2000	Proper Motion RA: 45.482 mas/yr Proper Motion Dec: 31.874 mas/yr Parallax: 0.0049134" Epoch of Position: 2000	
<p><i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i></p> <p><i>SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.</i></p> <p><i>Category=Star</i> <i>Description=[Exoplanet Systems]</i> <i>Extended=NO</i></p>				

Fixed Targets

# Proposal 9101 - Observation 1 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<b>Proposal 9101, Observation 1: MIRI LRS Transit</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Low Resolution Spectroscopy <i>Comments: Total length of observations 2*T14 + 1hr + 0.75hr (ramp settling) = 10.5hr.</i> <i>Allowing for extra 0.75 hr pre-transit to cut out MIRI settling ramp (recommended time of 0.5 hr). Excluding ramp settling gives adequate ~2.25:1 baseline.</i> <i>Two exposure breaks timed to occur at least 1 hr before first contact and within 1 hr of mid-transit depending on the scheduling.</i> <i>PA ranges calculated manually in Aladin to avoid contamination from background sources.</i> <i>01/08/26 - Ephemeris double checked. Propogated uncertainty in T0 is ~30mins in 2026 using current (Skaf+ 2020) ephermis. Updating to Kokori+ 2023 makes negligible difference. I'm not worried about this since propagating the ephemeris used in GO 1201 and 2437 forward perfectly matches.</i> <i>01/08/26 - Dropped number of exposure breaks from two to one. This should occur at least 10-15 mins after second contact, even if we get the earliest possible window.</i>																												
	(MIRI LRS Transit (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. (Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.																												
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Proposal 9101 - Observation 1 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	Optional ETC ID
	1	FASTR1	45	2637	5274	2	1	38583.422	221425.2
Special Requirements	Phase 0.9391663731075178 to 0.9491390988275968 with period 4.17806203 Days and zero-phase 2458238.943367 HJD Aperture PA Range 95.83544897 to 220.83544897 Degrees (V3 91.0 to 216.0) Aperture PA Range 268.83544897 to 41.83544897 Degrees (V3 264.0 to 37.0) Time Series Observation No Parallel Attachments								

# Proposal 9101 - Observation 2 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<b>Proposal 9101, Observation 2: MIRI LRS Transit</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Low Resolution Spectroscopy <i>Comments: Total length of observations <math>2 * T14 + 1hr + 0.75hr</math> (ramp settling) = 10.45hr.                  Phase constraints calculated assuming a minimum of T14 + ramp settling time (0.75hr) on target before mid-transit.                  PA ranges calculated manually in Aladin to avoid any contamination from single field star.                  Two exposure breaks timed to occur at least 1 hr before first contact and within 1 hr of mid-transit depending on the scheduling.                  PA ranges calculated manually in Aladin to minimize contamination from binary companion?                  01/08/26 - Ephemeris updated to Yee+ 2025. Propogated uncertainty in T0 is ~90mins in 2026. We will be able to capture the transit, however the timing of the exposure breaks etc. might not be ideal. This is currently scheduled to be the first observation.                  01/08/26 - Updated the groups/integrations to use 250 groups instead of 75 (70 vs 20% of saturation). I've also decrease the number of exposures to two from three. Given the uncertainty in the T0, fewer exposure breaks is probably better.</i>																									
	<b>Diagnosics</b> (MIRI LRS Transit (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. (Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Visit 2:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.																									
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1	SAME	F560W	FAST	12	1	1	1.908	221425.11																		
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Proposal 9101 - Observation 2 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Pointing Verification	#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	Optional ETC ID	Filter
		1	FASTR1	12	1	1	1	1	1.908	

  

Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	Optional ETC ID
		1	FASTR1	250	476	952	2	1	38002.608

  

Special Requirements	
	Phase 0.9599372539979031 to 0.9666078189427234 with period 6.2463475 Days and zero-phase 2459243.31080 HJD Aperture PA Range 152.83544897 to 208.83544897 Degrees (V3 148.0 to 204.0) Aperture PA Range 334.83544897 to 21.83544897 Degrees (V3 330.0 to 17.0) Time Series Observation No Parallel Attachments

# Proposal 9101 - Observation 3 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<b>Proposal 9101, Observation 3: NIRSpec G395M Transit</b> <b>Diagnostic Status: Warning</b> Observing Template: NIRSpec Bright Object Time Series <i>Comments: TA will saturate central pixel, but this has been done successfully many times before and shouldn't be an issue.</i> <i>Total length of observations 2*T14 + 1hr = 9.7hr.</i> <i>Phase constraints calculated assuming a minimum of T14 on target before mid-transit.</i> <i>Period and T0 from Barkaoui+ 2024.</i> <i>01/08/26 - Ephemeris updated to Yee+ 2025. Propogated uncertainty in T0 is ~90mins in 2026. The observing time is wide enough that we should capture the entire transit regardless of the T0 uncertainty. However, this should be updated with the results from whatever the first observation is.</i>																															
	<b>Diagnosics</b> (NIRSpec G395M Transit (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. (Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.																															
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<b>Template</b>	Subarray																															
	SUB2048																															
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	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID																						
1	G395M/F290LP	NRSRAPID	54	702	1	1	702	34840.597	221425.6																							

## Proposal 9101 - Observation 3 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Special Requirements

Phase 0.9649401047392941 to 0.9716106835670317 with period 6.2463475 Days and zero-phase 2459243.31080 HJD  
Time Series Observation  
No Parallel Attachments

# Proposal 9101 - Observation 4 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<b>Proposal 9101, Observation 4: NIRSpec G235M Transit</b> <b>Diagnostic Status: Warning</b> Observing Template: NIRSpec Bright Object Time Series <i>Comments: TA will saturate central pixel, but this has been done successfully many times before and shouldn't be an issue.</i> <i>Total length of observations 2*T14 + 1hr = 9.7hr.</i> <i>Phase constraints calculated assuming a minimum of T14 on target before mid-transit.</i> <i>Period and T0 from Barkaoui+ 2024.</i> <i>01/08/26 - Ephemeris updated to Yee+ 2025. Propogated uncertainty in T0 is ~90mins in 2026. The observing time is wide enough that we should capture the entire transit regardless of the T0 uncertainty. However, this should be updated with the results from whatever the first observation is.</i>																															
	<b>Diagnosics</b> (NIRSpec G235M Transit (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. (Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.																															
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## Proposal 9101 - Observation 4 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

**Special Requirements**

Phase 0.9649401047392941 to 0.9716106835670317 with period 6.2463475 Days and zero-phase 2459243.31080 HJD  
Time Series Observation  
No Parallel Attachments

# Proposal 9101 - Observation 5 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<p><b>Proposal 9101, Observation 5: NIRSpec G140H Transit</b></p> <p><b>Diagnostic Status: Warning</b></p> <p>Observing Template: NIRSpec Bright Object Time Series</p> <p><i>Comments: TA will saturate central pixel, but this has been done successfully many times before and shouldn't be an issue. Total length of observations 2*T14 + 1hr = 9.7hr. Phase constraints calculated assuming a minimum of T14 on target before mid-transit. Period and T0 from Barkaoui+ 2024. 05/12/25 - Switch to G140H from G140M in order to potentially do He science. 01/08/26 - Ephemeris updated to Yee+ 2025. Propogated uncertainty in T0 is ~90mins in 2026. The observing time is wide enough that we should capture the entire transit regardless of the T0 uncertainty. However, this should be updated with the results from whatever the first observation is.</i></p>																															
	<p>(NIRSpec G140H Transit (Obs 5)) 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 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>																															
<b>Diagnosics</b>																																
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1	G140H/F100LP	NRSRAPID	26	1433	1	1	1433	34928.63	221425.8																							

## Proposal 9101 - Observation 5 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Special Requirements

Phase 0.9649401047392941 to 0.9716106835670317 with period 6.2463475 Days and zero-phase 2459243.31080 HJD  
Time Series Observation  
No Parallel Attachments

# Proposal 9101 - Observation 6 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<b>Proposal 9101, Observation 6: MIRI LRS Transit</b> <b>Diagnostic Status: Warning</b> Observing Template: MIRI Low Resolution Spectroscopy <i>Comments: Total length of observations <math>2 * T14 + 1hr + 0.75hr</math> (ramp settling) = 8.4hr.                  Phase constraints calculated assuming a minimum of T14 + ramp settling time (0.75hr) on target before mid-transit.                  PA ranges calculated manually in Aladin to avoid any contamination from single field star.                  01/08/26 - Propogated TO uncertainty in 2026 is ~30 mins. The observing window should still be large enough that we capture the full transit and sufficient baseline. Though the ephemeris should be updated from the results of the first observation.                  01/08/26 - Increased the number of groups from 75 to 150 (~30 - 72% of saturation).</i>																												
	<b>Diagnosics</b> (MIRI LRS Transit (Obs 6)) 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 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.																												
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(3)	TOI-1420	RA: 21 31 45.9171 (322.9413212d) Dec: +66 20 55.93 (66.34887d) Equinox: J2000	Proper Motion RA: 45.482 mas/yr Proper Motion Dec: 31.874 mas/yr Parallax: 0.0049134" Epoch of Position: 2000																										
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1	SAME	F560W	FAST	8	1	1	1.272	221425.12																					
<b>Template</b>	Subarray				Obtain Verification Image?																								
	SLITLESSPRISM				true																								
<b>Dithers</b>	#		Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset																						
	1		NONE																										
<b>Pointing Verification</b>	<table border="1"> <thead> <tr> <th>#</th> <th>PV Readout Pattern</th> <th>PV Groups/Int</th> <th>PV Integrations/Exp</th> <th>PV Total Integrations</th> <th>PV Exposures/Dith</th> <th>PV Total Dithers</th> <th>PV Total Exposure Time</th> <th>Optional ETC ID</th> <th>Filter</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>FASTR1</td> <td>8</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1.272</td> <td></td> <td>F560W</td> </tr> </tbody> </table>									#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	Optional ETC ID	Filter	1	FASTR1	8	1	1	1	1	1.272		F560W
	#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	Optional ETC ID	Filter																			
1	FASTR1	8	1	1	1	1	1.272		F560W																				

Proposal 9101 - Observation 6 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	Optional ETC ID
		1	FASTR1	150	1267	1267	1	1	30426.897
Special Requirements	Phase 0.9691513321832471 to 0.9751413647690244 with period 6.9561063 Days and zero-phase 2459517.43305 HJD Aperture PA Range 75.83544897 to 196.83544897 Degrees (V3 71.0 to 192.0) Aperture PA Range 248.83544897 to 23.83544897 Degrees (V3 244.0 to 19.0) Time Series Observation No Parallel Attachments								

# Proposal 9101 - Observation 7 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<p><b>Proposal 9101, Observation 7: NIRSpec G395M Transit</b></p> <p><b>Diagnostic Status: Warning</b></p> <p>Observing Template: NIRSpec Bright Object Time Series</p> <p><i>Comments: Total length of observations <math>2 \times T14 + 1hr = 7.7hr</math>. Phase constraints calculated assuming a minimum of T14 on target before mid-transit. Period and T0 from Yoshida+ 2023. NIRISS and NIRSpec observations are linked to be scheduled within ~one week of each other as to capture subsequent transits for TLS mitigation. TA will saturate central pixel, but this has been done successfully many times before and shouldn't be an issue. 01/08/26 - Propogated T0 uncertainty in 2026 is ~30 mins. The observing window should still be large enough that we capture the full transit and sufficient baseline. Though the ephemeris should be updated from the results of the first observation.</i></p>																															
	<p>(NIRSpec G395M Transit (Obs 7)) 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 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.</p>																															
<b>Diagnosics</b>																																
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	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous																											
(3)	TOI-1420	RA: 21 31 45.9171 (322.9413212d) Dec: +66 20 55.93 (66.34887d) Equinox: J2000	Proper Motion RA: 45.482 mas/yr Proper Motion Dec: 31.874 mas/yr Parallax: 0.0049134" Epoch of Position: 2000																													
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	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID																					
1	SAME	WATA	SUB32	F110W	NRSRAPID	3	1	1	0.08	221425.14																						
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	#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID																						
1	G235M/F170LP	NRSRAPID	30	977	1	1	977	27338.883	221425.5																							

## Proposal 9101 - Observation 7 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

### Special Requirements

Phase 0.97364385662258 to 0.9796338892083573 with period 6.9561063 Days and zero-phase 2459517.43305 HJD  
Time Series Observation  
No Parallel Attachments  
Sequence Observations 7, 8 within 8 Days

# Proposal 9101 - Observation 8 - Unveiling the Nature of Super-Puffs: A Panchromatic Transmission Spectroscopy Survey

Wed Jan 14 00:01:03 GMT 2026

<b>Observation</b>	<b>Proposal 9101, Observation 8: NIRISS SOSS Transit</b> <b>Diagnostic Status: Warning</b> Observing Template: NIRISS Single-Object Slitless Spectroscopy <i>Comments: Total length of observations 2*T14 + 1hr = 7.7hr.</i> <i>Phase constraints calculated assuming a minimum of T14 on target before mid-transit.</i> <i>Period and T0 from Yoshida+ 2023.</i> <i>PA ranges calculated to minimize contamination from crowded field.</i> <i>NIRISS and NIRSpec observations are linked to be scheduled within one week of eachother as to capture subsequent transits for TLS mitigation.</i> <i>01/08/26 - Propogated T0 uncertainty in 2026 is ~30 mins. The observing window should still be large enough that we capture the full transit and sufficient baseline. Though the ephemeris should be updated from the results of the first observation.</i>																																													
	(NIRISS SOSS Transit (Obs 8)) 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 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.																																													
<b>Diagnosics</b>																																														
<b>Fixed Targets</b>	<table border="1"> <thead> <tr> <th>#</th> <th>Name</th> <th>Target Coordinates</th> <th>Targ. Coord. Corrections</th> <th>Miscellaneous</th> </tr> </thead> <tbody> <tr> <td>(3)</td> <td>TOI-1420</td> <td>RA: 21 31 45.9171 (322.9413212d) Dec: +66 20 55.93 (66.34887d) Equinox: J2000</td> <td>Proper Motion RA: 45.482 mas/yr Proper Motion Dec: 31.874 mas/yr Parallax: 0.0049134" Epoch of Position: 2000</td> <td></td> </tr> </tbody> </table>										#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous	(3)	TOI-1420	RA: 21 31 45.9171 (322.9413212d) Dec: +66 20 55.93 (66.34887d) Equinox: J2000	Proper Motion RA: 45.482 mas/yr Proper Motion Dec: 31.874 mas/yr Parallax: 0.0049134" Epoch of Position: 2000																											
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<i>Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.</i> <i>SIMBAD listed proper motion for this target. When retrieving targets with PM from SIMBAD, APT requests the coordinates be calculated with an epoch of the year 2000. Do not modify this epoch. Always review coordinates using the Target Confirmation tool, which graphically displays the PM.</i> Category=Star Description=[Exoplanet Systems] Extended=NO																																														
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### Special Requirements

Phase 0.97364385662258 to 0.9796338892083573 with period 6.9561063 Days and zero-phase 2459517.43305 HJD  
Aperture PA Range 16 to 27 Degrees (V3 15.43873283 to 26.43873283)  
Aperture PA Range 45 to 55 Degrees (V3 44.43873283 to 54.43873283)  
Time Series Observation  
No Parallel Attachments  
  
Sequence Observations 7, 8 within 8 Days