



11079 - Extending NIRCcam Coronagraphy into the Optical Regime

Cycle: 5, 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>
Photometric Calibration - SW Filters				
	1	G-Star - P330-E	NIRCcam Coronagraphic Imaging	(2) P330-E
	2	A-Star - J1743045	NIRCcam Coronagraphic Imaging	(1) J1743045
MASK335R Validation				
	3	Demo Target - Roll 1	NIRCcam Coronagraphic Imaging	(3) WD+MS
	4	Demo Target - Roll 2	NIRCcam Coronagraphic Imaging	(3) WD+MS
	5	PSF Reference	NIRCcam Coronagraphic Imaging	(4) WD+MS-PSF

ABSTRACT

We propose to open a new window for JWST: optical coronagraphy with NIRCcam.

JWST Proposal 11079 (Created: Friday, September 11, 2026, 5:00:47PM Eastern Standard Time) - Overview

At present, JWST's coronagraphic imaging is limited to wavelengths longer than 1.7 micron - yet the most revealing disk structures and dust scattering signals lie at shorter, optical wavelengths. Our laboratory measurements of a flight spare coronagraphic mask show substantial throughput down to 0.6 micron, demonstrating that NIRCcam can, in fact, perform high-contrast imaging in a regime once thought inaccessible. This discovery allows us to extend JWST's reach into the optical and bridge the gap between HST and the infrared, creating a capability no other observatory can match.

This program will commission and calibrate the short-wavelength NIRCcam coronagraphic mode, establishing the performance of the MASK335R Lyot spot in the F070W–F150W filters. We will validate its contrast using a binary test system and derive precise photometric calibrations from hot and cool standard stars. The results will enable the community to exploit optical coronagraphy with JWST for exoplanet, debris disk, and circumstellar environment studies - delivering sharper PSFs, smaller inner working angles, and color-resolved views of scattered light.

With HST nearing the end of its life and Roman's coronagraph limited in access and field of view, this effort ensures that JWST continues access to a space-based high-contrast platform across the optical-to-infrared spectrum, preserving a critical capability for the coming decades and expanding the scientific power of NIRCcam beyond its original design.

OBSERVING DESCRIPTION

We will commission NIRCcam's short-wavelength coronagraphic mode using the MASK335R round Lyot spot with filters F070W, F090W, F115W, and F150W. Observations will characterize throughput, contrast, and photometric response to enable community use of optical coronagraphy.

(1) Photometric Calibration: Observe two standard calibrators, J1743045 (A-type) and P330E (G-type), through all four filters to derive wavelength-dependent photometric zero points. These are observed at a position offset by 5" from the mask center using a 9pt SGD. Currently the "F182M" mask is the placeholder for the requested SW filters which are not available for selection at the moment. We will also observe the system with the nominal F210+F335 filter combination to establish possible chromatic offsets.

(2) Performance Verification: Observe the HD 114174 (WD+MS) binary to measure suppression and contrast performance, with a suitable PSF reference source (HD 111733). The binary will be measured using two roll angles and the PSF reference will be observed with a 5-point small-grid dither pattern.

All observations use the standard NIRCcam coronagraphic templates. Results will define JWST's first optical coronagraphic calibration and extend its

high-contrast imaging capability below 1.7 μm .

Proposal 11079 - Targets - Extending NIRCcam Coronagraphy into the Optical Regime

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	J1743045	RA: 17 43 4.4856 (265.7686900d) Dec: +66 55 1.66 (66.91713d) Equinox: J2000	Proper Motion RA: 1.124 mas/yr Proper Motion Dec: -2.714 mas/yr Parallax: 0.00054" Epoch of Position: 2000	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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. Category=Calibration Description=[A stars, Coronagraphic, Photometric] Extended=NO				
	(2)	P330-E	RA: 16 31 33.8124 (247.8908850d) Dec: +30 08 46.40 (30.14622d) Equinox: J2000	Proper Motion RA: -8.882 mas/yr Proper Motion Dec: -38.705 mas/yr Parallax: 0.0022149" Epoch of Position: 2000	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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. Category=Calibration Description=[Coronagraphic, G stars, Photometric] Extended=NO				
Fixed Targets	(3)	WD+MS	RA: 13 08 51.0230 (197.2125958d) Dec: +05 12 26.07 (5.20724d) Equinox: J2000	Proper Motion RA: 85.533 mas/yr Proper Motion Dec: -680.324000040855 mas/yr Parallax: 0.0378677" Epoch of Position: 2000	
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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. Category=Calibration Description=[Coronagraphic, G stars, Point spread function] Extended=NO				
	(4)	WD+MS-PSF	RA: 12 51 20.2522 (192.8343842d) Dec: +08 12 37.59 (8.21044d) Equinox: J2000	Proper Motion RA: -32.919 mas/yr Proper Motion Dec: 3.234 mas/yr Parallax: 0.0052744" Epoch of Position: 2000	
Fixed Targets	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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. Category=Calibration Description=[Coronagraphic, G stars, Point spread function] Extended=NO				

Proposal 11079 - Observation 1 - Extending NIRCcam Coronagraphy into the Optical Regime

Observation	Proposal 11079, Observation 1: G-Star - P330-E										Fri Sep 11 22:00:47 GMT 2026
	Diagnostic Status: Warning										
	Observing Template: NIRCam Coronagraphic Imaging										
	Comments: The first observation sequence is on the nominal F210M (and F335M) filter, which is used to establish chromatic shifts of subsequent filters										
Diagnostics	(G-Star - P330-E (Obs 1)) Warning (Form): Observers are responsible for checking that target acquisition is feasible.										
	(G-Star - P330-E (Obs 1)) Warning (Form): Specified offset will be added to offset from Coronagraphic Offsets file in the SOC PRD										
	(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(2)	P330-E	RA: 16 31 33.8124 (247.8908850d) Dec: +30 08 46.40 (30.14622d) Equinox: J2000			Proper Motion RA: -8.882 mas/yr Proper Motion Dec: -38.705 mas/yr Parallax: 0.0022149" Epoch of Position: 2000					
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
	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. Category=Calibration Description=[Coronagraphic, G stars, Photometric] Extended=NO										
Acquisition	#	Target	Filter	Target Brightness	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	SAME	F335M	FAINT	SHALLOW4	9	1	1	2.26		
Template	Module		Occulting Mask		Obtain Astrometric Confirmation Images?		Subarray		Dither Pattern		
	A		MASK335R		false		FULL		9-POINT-CIRCLE		
Spectral Elements	#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	F210M	F335M	RAPID	5	1	9	9	483.155		
	2	F070W	F250M	RAPID	5	1	9	9	483.155		
	3	F090W	F410M	RAPID	5	1	9	9	483.155		
	4	F115W	F460M	RAPID	5	1	9	9	483.155		
	5	F150W	F480M	RAPID	5	1	9	9	483.155		
PSF References	PSF Reference: true										

Proposal 11079 - Observation 1 - Extending NIRCcam Coronagraphy into the Optical Regime

Special Requirements	Before Date 01-MAR-2027:00:00:00 Offset 0.0 arcsec, 5.0 arcsec
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Proposal 11079 - Observation 2 - Extending NIRCcam Coronagraphy into the Optical Regime

Observation	Proposal 11079, Observation 2: A-Star - J1743045										Fri Sep 11 22:00:47 GMT 2026
	Diagnostic Status: Warning										
	Observing Template: NIRCcam Coronagraphic Imaging										
	Comments: The first observation sequence is on the nominal F210M (and F335M) filter, which is used to establish chromatic shifts of subsequent filters										
Diagnostics	(A-Star - J1743045 (Obs 2)) Warning (Form): Observers are responsible for checking that target acquisition is feasible.										
	(A-Star - J1743045 (Obs 2)) Warning (Form): Specified offset will be added to offset from Coronagraphic Offsets file in the SOC PRD										
Fixed Targets	(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
	#	Name	Target Coordinates		Targ. Coord. Corrections			Miscellaneous			
	(1)	J1743045	RA: 17 43 4.4856 (265.7686900d) Dec: +66 55 1.66 (66.91713d) Equinox: J2000		Proper Motion RA: 1.124 mas/yr Proper Motion Dec: -2.714 mas/yr Parallax: 0.00054" Epoch of Position: 2000						
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.										
Acquisition	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.										
	Category=Calibration										
	Description=[A stars, Coronagraphic, Photometric]										
	Extended=NO										
Acquisition	#	Target	Filter	Target Brightness	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	SAME	F335M	FAINT	SHALLOW4	9	1	1	2.26		
Template	Module		Occulting Mask		Obtain Astrometric Confirmation Images?		Subarray		Dither Pattern		
	A		MASK335R		false		FULL		9-POINT-CIRCLE		
Spectral Elements	#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	F210M	F335M	RAPID	5	1	9	9	483.155		
	2	F070W	F250M	RAPID	5	1	9	9	483.155		
	3	F090W	F410M	RAPID	5	1	9	9	483.155		
	4	F115W	F460M	RAPID	5	1	9	9	483.155		
	5	F150W	F480M	RAPID	5	1	9	9	483.155		
PSF References	PSF Reference: true										

Proposal 11079 - Observation 2 - Extending NIRCcam Coronagraphy into the Optical Regime

Special Requirements	Before Date 01-DEC-2026:00:00:00 Offset 0.0 arcsec, 5.0 arcsec
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Proposal 11079 - Observation 3 - Extending NIRCcam Coronagraphy into the Optical Regime

Observation	Proposal 11079, Observation 3: Demo Target - Roll 1										Fri Sep 11 22:00:47 GMT 2026	
	Diagnostic Status: Warning											
Observing Template: NIRCam Coronagraphic Imaging												
Diagnostics	(Demo Target - Roll 1 (Obs 3)) Warning (Form): Observers are responsible for checking that target acquisition is feasible.											
	(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.											
	(Demo Target - Roll 1 (Obs 3)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.											
	(Visit 3:1) 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.											
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous			
	(3)	WD+MS	RA: 13 08 51.0230 (197.2125958d) Dec: +05 12 26.07 (5.20724d) Equinox: J2000			Proper Motion RA: 85.533 mas/yr Proper Motion Dec: -680.324000040855 mas/yr Parallax: 0.0378677" Epoch of Position: 2000						
	Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.											
	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.											
	Category=Calibration											
	Description=[Coronagraphic, G stars, Point spread function] Extended=NO											
Acquisition	#	Target	Filter	Target Brightness	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID		
	1	SAME	F335M	BRIGHT (ND Square)	DEEP8	9	1	1	8.48			
Template	Module		Occulting Mask		Obtain Astrometric Confirmation Images?		Subarray		Dither Pattern			
	A		MASK335R		true		SUB320A335R		NONE			
Confirmation	#	Conf. Readout Pattern		Conf. Groups/Int		Conf. Integrations/Exp		Conf. Total Integrations		Conf. Total Exposure Time		Conf. Total Dithers
	1	RAPID		3		3		3		118.104		1
Spectral Elements	#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID		
	1	F070W	F335M	MEDIUM8	10	20	1	20	2117.109			
	2	F090W	F250M	MEDIUM8	10	20	1	20	2117.109			
	3	F115W	F410M	MEDIUM8	10	20	1	20	2117.109			
	4	F150W	F480M	MEDIUM8	10	20	1	20	2117.109			

Proposal 11079 - Observation 3 - Extending NIRCам Coronagraphy into the Optical Regime

PSF References	PSF Reference (Obs 5) (PSF Reference; Filters [F070W/F335M, F090W/F250M, F115W/F410M, F150W/F480M]) Demo Target - Roll 2 (Obs 4) (Filters [F070W/F335M, F090W/F250M, F115W/F410M, F150W/F480M]) Additional Justification: false
Special Requirements	Between Dates 30-DEC-2026:00:00:00 and 14-FEB-2027:00:00:00 No Parallel Attachments Group Observations 3, 4, 5, Non-interruptible Aperture PA Offset 3 from 4 by 8 to 12 Degrees (Same offsets in V3)

Proposal 11079 - Observation 4 - Extending NIRCcam Coronagraphy into the Optical Regime

Observation	Proposal 11079, Observation 4: Demo Target - Roll 2									
	Diagnostic Status: Warning Observing Template: NIRCam Coronagraphic Imaging									
Diagnostics	(Demo Target - Roll 2 (Obs 4)) Warning (Form): Observers are responsible for checking that target acquisition is feasible. (Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run. (Demo Target - Roll 2 (Obs 4)) Informational (Form): The Visit Planner and Spike may produce different schedulability results. (Visit 4:1) 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.									
	Fixed Targets	# Name Target Coordinates Targ. Coord. Corrections Miscellaneous								
(3) WD+MS RA: 13 08 51.0230 (197.2125958d) Proper Motion RA: 85.533 mas/yr Dec: +05 12 26.07 (5.20724d) Proper Motion Dec: -680.324000040855 mas/yr Equinox: J2000 Parallax: 0.0378677" Epoch of Position: 2000 Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. 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. Category=Calibration Description=[Coronagraphic, G stars, Point spread function] Extended=NO										
Acquisition	# Target Filter Target Brightness Readout Pattern Groups/Int Integrations/Exp Total Integrations Total Exposure Time Optional ETC ID									
	1 SAME F335M BRIGHT (ND Square) DEEP8 9 1 1 8.48									
Template	Module Occulting Mask Obtain Astrometric Confirmation Images? Subarray Dither Pattern									
	A MASK335R true SUB320A335R NONE									
Confirmation	# Conf. Readout Pattern Conf. Groups/Int Conf. Integrations/Exp Conf. Total Integrations Conf. Total Exposure Time Conf. Total Dithers									
	1 RAPID 3 3 3 118.104 1									
Spectral Elements	# Short Filter Long Filter Readout Pattern Groups/Int Integrations/Exp Total Dithers Total Integrations Total Exposure Time Optional ETC ID									
	1 F070W F335M MEDIUM8 10 20 1 20 2117.109									
	2 F090W F250M MEDIUM8 10 20 1 20 2117.109									
	3 F115W F410M MEDIUM8 10 20 1 20 2117.109									
	4 F150W F480M MEDIUM8 10 20 1 20 2117.109									

Proposal 11079 - Observation 4 - Extending NIRCcam Coronagraphy into the Optical Regime

PSF References	PSF Reference (Obs 5) (PSF Reference; Filters [F070W/F335M, F090W/F250M, F115W/F410M, F150W/F480M]) Demo Target - Roll 1 (Obs 3) (Filters [F070W/F335M, F090W/F250M, F115W/F410M, F150W/F480M]) Additional Justification: false
Special Requirements	No Parallel Attachments Group Observations 3, 4, 5, Non-interruptible Aperture PA Offset 3 from 4 by 8 to 12 Degrees (Same offsets in V3)

Proposal 11079 - Observation 5 - Extending NIRCcam Coronagraphy into the Optical Regime

Observation	Proposal 11079, Observation 5: PSF Reference										Fri Sep 11 22:00:47 GMT 2026
	Diagnostic Status: Warning										
	Observing Template: NIRCam Coronagraphic Imaging										
Diagnostics	(PSF Reference (Obs 5)) Warning (Form): Observers are responsible for checking that target acquisition is feasible.										
	(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.										
Fixed Targets	#	Name	Target Coordinates			Targ. Coord. Corrections			Miscellaneous		
	(4)	WD+MS-PSF	RA: 12 51 20.2522 (192.8343842d)			Proper Motion RA: -32.919 mas/yr					
			Dec: +08 12 37.59 (8.21044d)			Proper Motion Dec: 3.234 mas/yr					
			Equinox: J2000			Parallax: 0.0052744"					
						Epoch of Position: 2000					
		Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.									
	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.										
	Category=Calibration										
	Description=[Coronagraphic, G stars, Point spread function]										
	Extended=NO										
Acquisition	#	Target	Filter	Target Brightness	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	SAME	F335M	BRIGHT (ND Square)	DEEP8	9	1	1	8.48		
Template	Module	Occulting Mask			Obtain Astrometric Confirmation Images?		Subarray		Dither Pattern		
	A	MASK335R			true		SUB320A335R		5-POINT-BOX		
Confirmation	#	Conf. Readout Pattern	Conf. Groups/Int	Conf. Integrations/Exp	Conf. Total Integrations	Conf. Total Exposure Time	Conf. Total Dithers				
	1	RAPID	3	3	3	118.104	1				
Spectral Elements	#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	F070W	F335M	MEDIUM8	10	5	5	25	2646.386		
	2	F090W	F250M	MEDIUM8	10	5	5	25	2646.386		
	3	F115W	F410M	MEDIUM8	10	5	5	25	2646.386		
	4	F150W	F480M	MEDIUM8	10	5	5	25	2646.386		

Proposal 11079 - Observation 5 - Extending NIRCcam Coronagraphy into the Optical Regime

PSF References	PSF Reference: true
Special Requirements	No Parallel Attachments Group Observations 3, 4, 5, Non-interruptible