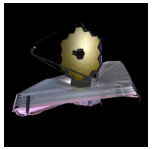

1192 - Physics and Chemistry of PDR Fronts

Cycle: 1, Proposal Category: GTO

INVESTIGATORS

Name	*Institution*
Dr. Karl Misselt (PI)	**University of Arizona**
Dr. Karl D. Gordon (CoI)	Space Telescope Science Institute
Dr. Adolf N. Witt (CoI)	University of Toledo
Dr. Henrik Beuther (CoI) (ESA Member)	Max Planck Institute for Astronomy
Prof. Bernhard Rainer Brandl (CoI) (ESA Member)	Universiteit Leiden
Dr. Dries Van De Putte (CoI)	Space Telescope Science Institute
Dr. Pierre Guillard (CoI) (ESA Member)	CNRS, Institut d'Astrophysique de Paris
Dr. Heddy Arab (CoI) (ESA Member)	Universite de Strasbourg I
Prof. Maarten Baes (CoI) (ESA Member)	Universiteit Gent
Dr. Pamela Klaassen (CoI) (ESA Member)	United Kingdom Astronomy Technology Centre
Dr. Patrice Bouchet (CoI) (ESA Member)	CEA/DSM/Irfu/Service d'Astrophysique - Laboratoire AIM
Sarah Kendrew (CoI) (ESA Member)	Space Telescope Science Institute - ESA - JWST
Dr. Tea Temim (CoI)	Princeton University
Prof. Alain Abergel (CoI) (ESA Member)	Institut d'Astrophysique Spatiale
Dr. Alberto Noriega-Crespo (CoI)	Space Telescope Science Institute
Jose Lorenzo Alvarez (CoI) (ESA Member)	European Space Agency - ESTEC
Dr. James Muzerolle (CoI) (CoPI)	Space Telescope Science Institute

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
NGC 7023 NW				
	7	NIRCam Imaging	NIRCam Imaging	(13) NGC-7023-NW-FILAMENT-IMAGING
	6	MIRI Imaging	MIRI Imaging	(13) NGC-7023-NW-FILAMENT-IMAGING

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	1	MIRI IFU Filament1	MIRI Medium Resolution Spectroscopy	(11) NGC-7023-NW-FILAMENT
	2	MIRI IFU Background	MIRI Medium Resolution Spectroscopy	(12) NGG7023-BACKGROUND
	8	NIRSpec IFU Filament 1	NIRSpec IFU Spectroscopy	(11) NGC-7023-NW-FILAMENT
	9	NIRSpec IFU Background	NIRSpec IFU Spectroscopy	(12) NGG7023-BACKGROUND
HORSEHEAD				
	15	NIRCam Imaging	NIRCam Imaging	(15) HORSEHEAD-FILAMENT-IMAGING
	14	MIRI Imaging	MIRI Imaging	(15) HORSEHEAD-FILAMENT-IMAGING
	10	MIRI IFU Filament1	MIRI Medium Resolution Spectroscopy	(2) HORSEHEAD-FILAMENT
	11	MIRI IFU Background	MIRI Medium Resolution Spectroscopy	(14) HORSEHEAD-BACKGROUND
	16	NIRSpec IFU Filament 1	NIRSpec IFU Spectroscopy	(2) HORSEHEAD-FILAMENT
	17	NIRSpec IFU Background	NIRSpec IFU Spectroscopy	(14) HORSEHEAD-BACKGROUND

ABSTRACT

Photodissociation regions (PDRs) are predominantly neutral regions of the ISM in which the heating and chemistry are mainly regulated by far ultraviolet photons. They are extended regions at the interface between bright stars and molecular clouds, and contain dense structures and clumps immersed in a more diffuse medium which are subjected to photo-evaporation, which brings fresh matter into the diffuse hotter zone. The interaction of stellar radiation with in situ material includes: (1) the disruption of grain mantles/clusters formed in shielded dense regions or coagulated grains, (2) ionization and dissociation of the gas and (3) gas and dust heating. Studies of nearby PDRs have shown that these processes are strongly stratified and active on angular scales that can be as small as 1” (0.002 pc/400 au at a distance of 400 pc), indicating that the physical conditions vary dramatically on small spatial-scales in PDRs (variations in gas temperature from 100 1000 K to 10 30 K and in gas density from 102 103 to 104 106 cm3). Nearby PDRs are therefore unique targets to study rapid variations in the dust and gas components as a function of the excitation and physical conditions. We propose to combine imaging and spectroscopy of two emblematic PDRs, the Horsehead and NGC7023, with MIRI, NIRCam and NIRSpec. These two nearby PDRs have different excitation conditions, with simple geometries, and are ideal to take full advantages of the high spatial resolution provided by JWST. NIRCam will be used to map in the F212N (H2 1-0 S(1)) and F335M (PAHs). Other NIRCam filters will be used to map the PDR continuum and extended red emission.

OBSERVING DESCRIPTION

Achieving the science goals of this project requires multiwavelength imaging of matched regions across a very narrow PDR front with high spatial resolution perpendicular to the front.

To accomplish this, we use a large suite of JWST instruments and modes. Our primary observations employ the MIRI and NIRSpec IFUs to cover nearly the full wavelength range

of JWST. All four MIRI IFU channels are used along with two NIRSpec grating settings (G395M/F290LP and G235M/F170LP) to provide continuous wavelength coverage between

~1.7 and 28 um at a resolution of ~1000. The IFUs are mosaiced in a narrow strip perpendicular to the PDR front. The mosaics are constucted to be approximately

1x6 IFU FOVs (~3x18 arcsec). Position angle constraints have been used to ensure that the MIRI and NIRSpec IFU strips cover the same spatial region across the front, extending

on one side into the HII region and the molecular cloud on the other. To complement the spatially limited maps with the IFUs, we also image both PDRs with MIRI and NIRCam.

MIRI imaging utilizes all 9 main MIRI filters while we employ 10 NIRCam filters (5 each in the SW and LW channels). The imaging is configured to cover the region of the PDR front

covered in the IFU maps as well as a much larger region of the PDR environment. The NIRCam filters are chosen to cover important PDR lines (e.g. H2 1-0 S(1), Bra alpha) as well

"solid state" features (e.g. 3.3um PAH). The MIRI filters cover PAH features and continuum. The large spatial coverage of the imagers will tie the detailed spectral data in the limited

IFU mapping region to the larger PDR environment. Position angle constraints have been placed on the NIRCam imaging to ensure that the IFU mapped region fall on a favorable region

of an SCA while avoiding bright objects falling on other SCAs). The constraints additionally ensure that the MIRI imaging obtained in parallel for use as backgrounds to the science MIRI

imaging fall on sourceless regions and are contemporaneous temporally with the MIRI imaging. IFU observations are linked with off-source background regions; we link them to ensure

contemporaneous measurements of zodiacal and telescope backgrounds. NIRCam imaging is combined with MIRI parallel imaging to generate background estimates in selected MIRI filters.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	HORSEHEAD-FILAMENT	RA: 05 40 53.6500 (85.2235417d) Dec: -02 28 4.30 (-2.46786d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	
Comments: *Category=ISM* *Description=[Photodissociation regions, Reflection nebulae]*				
(11)	NGC-7023-NW-FILAMENT	RA: 21 01 31.8800 (315.3828333d) Dec: +68 10 24.50 (68.17347d) Equinox: J2000		
Comments: *Category=ISM* *Description=[Bright nebulae]*				
(12)	NGG7023-BACKGROUND	RA: 21 02 46.9000 (315.6954167d) Dec: +68 14 7.00 (68.23528d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Blank field]* *Extended=YES*				
(13)	NGC-7023-NW-FILAMENT-IMAGING	RA: 21 01 31.8800 (315.3828333d) Dec: +68 10 24.50 (68.17347d) Equinox: J2000		
Comments: *Category=ISM* *Description=[Bright nebulae]*				
(14)	HORSEHEAD-BACKGROUND	RA: 05 40 51.0000 (85.2125000d) Dec: -02 21 26.00 (-2.35722d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	
Comments: *Category=ISM* *Description=[Photodissociation regions, Reflection nebulae]*				
(15)	HORSEHEAD-FILAMENT-IMAGING	RA: 05 40 53.6500 (85.2235417d) Dec: -02 28 4.30 (-2.46786d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	
Comments: *Category=ISM* *Description=[Photodissociation regions, Reflection nebulae]*				

Observation

Proposal 1192, Observation 7: NIRCam Imaging Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Coordinated Parallel Template(s): MIRI Imaging

Comments: Aperture PA constraint is purely for accurate visualization in Aladin; Sequence non-interruptible constraint is the true constraint. It (sequence) ties us to the MIRI IFU which has the true PA constraint. We require the NIRCam imaging to be non-interuptible so that the MIRI imaging (background) is contemporaneous with the MIRI observations.
Offset constraint ensures correct positioning of target on the NIRCam FOV relative to the pointing location at the center of the module B SW FPA
Offset constraint must be revisisted for scheduled observation date to ensure correct overlap of MIRI imaging backgrounds

Diagnostics

(Visit 7:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(13)	NGC-7023-NW-FILAMENT-IMAGING	RA: 21 01 31.8800 (315.3828333d) Dec: +68 10 24.50 (68.17347d) Equinox: J2000		

Comments:
Category=ISM
Description=[Bright nebulae]

Template

NIRCam Imaging	MIRI Imaging
Module: B	Subarray: FULL
Subarray: FULL	
Target Placement: Module Gap	

Dithers

#	Primary Dither Type	Primary Dithers	Dither Size	Subpixel Positions	Coordinated Parallel Subpixel Selector	Dither Direct Images Primes
1	NONE			1	3-POINT-WITH-MIRI-F560W	NO_DITHERING

Spectral Elements

NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F187N	F405N+F444W	BRIGHT2	7	1	3	3	450.944	
2	F164N+F150W2	F470N+F444W	BRIGHT2	7	1	3	3	450.944	
3	F212N	F323N+F322W2	BRIGHT2	7	1	3	3	450.944	
4	F210M	F430M	BRIGHT2	5	1	3	3	322.103	
5	F140M	F335M	BRIGHT2	5	1	3	3	322.103	
6	F090W	F300M	BRIGHT2	5	1	3	3	322.103	
7	F070W	F250M	BRIGHT2	7	1	3	3	450.944	

Spectral Elements

MIRI Imaging	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F1000W	FASTR1	35	1	1		3	3	291.379	
2	F1130W	FASTR1	35	1	1		3	3	291.379	
3	F1280W	FASTR1	35	1	1		3	3	291.379	
4	F1500W	FASTR1	35	1	1		3	3	291.379	
5	F1800W	FASTR1	35	1	1		3	3	291.379	
6	F2100W	FASTR1	35	1	1		3	3	291.379	
7	F2550W	FASTR1	50	1	1		3	3	416.256	

Special Requirements	
	Aperture PA Range 135 to 135 Degrees (V3 134.94416471 to 134.94416471) Offset -32.0 arcsec, 40.0 arcsec No Parallel Attachments Sequence Observations 1, 2, 6, 7, Non-interruptible

Observation

Proposal 1192, Observation 6: MIRI Imaging Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: Aperture PA constraint is purely for accurate visualization in Aladin; Sequence non-interruptible constraint is the true constraint. It (sequence) ties us to the MIRI IFU which has the true PA constraint.
Offset constraint ensures correct positioning of target on the MIRI FOV
Offset constraint must be revisisted for scheduled observation date

Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(13)	NGC-7023-NW-FILAMENT-IMAGING	RA: 21 01 31.8800 (315.3828333d) Dec: +68 10 24.50 (68.17347d) Equinox: J2000		

Comments:
Category=ISM
Description=[Bright nebulae]

Template

Subarray
FULL

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	1	3		6	1			LARGE

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F560W	FASTR1	9	1	1	Dither 1	3	3	74.926	
2	F770W	FASTR1	9	1	1	Dither 1	3	3	74.926	
3	F1000W	FASTR1	9	1	1	Dither 1	3	3	74.926	
4	F1130W	FASTR1	9	1	1	Dither 1	3	3	74.926	
5	F1500W	FASTR1	9	1	1	Dither 1	3	3	74.926	
6	F1280W	FASTR1	9	1	1	Dither 1	3	3	74.926	
7	F1800W	FASTR1	12	1	1	Dither 1	3	3	99.901	
8	F2100W	FASTR1	12	1	1	Dither 1	3	3	99.901	
9	F2550W	FASTR1	12	1	1	Dither 1	3	3	99.901	

Special Requirements

Aperture PA Range 135 to 135 Degrees (V3 130.16455103 to 130.16455103)
Offset -5.0 arcsec, 20.0 arcsec

Sequence Observations 1, 2, 6, 7, Non-interruptible

Observation

Proposal 1192, Observation 1: MIRI IFU Filament1 Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI IFU Background (Obs 2)]

Comments: Observation windows can be expanded by rotating the orient constraints by 90 degrees and exchanging the row and column mosaic configuration. The 45 degree orient thereby obtained is schedulable with a march 2021 launch. For our default x-mosaic configuration, only the 135 degree orient is available.
Aperture PA constraint ensures that mosaic lies perpendicular to PDR front.

Diagnostics

(Visit 1:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(11)	NGC-7023-NW-FILAMENT	RA: 21 01 31.8800 (315.3828333d) Dec: +68 10 24.50 (68.17347d) Equinox: J2000		

Comments:
Category=ISM
Description=[Bright nebulae]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
F560W	All MRS	YES	FULL	NEUTRAL

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
6	1	10.0	0.0	0.0	0.0	DEFAULT

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F1000W	FASTR1	11	1	1	Dither 1	4	4	122.102	
1	LONG(C)	MRSLONG		FASTR1	11	1	1	Dither 1	4	4	122.102	
1	LONG(C)	MRSSHORT		FASTR1	11	1	1	Dither 1	4	4	122.102	
2		IMAGER	F770W	FASTR1	11	1	1	Dither 1	4	4	122.102	
2	MEDIUM(B)	MRSLONG		FASTR1	11	1	1	Dither 1	4	4	122.102	
2	MEDIUM(B)	MRSSHORT		FASTR1	11	1	1	Dither 1	4	4	122.102	
3		IMAGER	F560W	FASTR1	11	1	1	Dither 1	4	4	122.102	
3	SHORT(A)	MRSLONG		FASTR1	11	1	1	Dither 1	4	4	122.102	
3	SHORT(A)	MRSSHORT		FASTR1	11	1	1	Dither 1	4	4	122.102	

Special Requirements

Aperture PA Range 135 to 135 Degrees (V3 135.0 to 135.0)

Sequence Observations 1, 2, 6, 7, Non-interruptible

Observation

Proposal 1192, Observation 2: MIRI IFU Background Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI IFU Filament1 (Obs 1)]

Comments: Aperture PA constraint is purely for accurate visualization in Aladin; Sequence non-interruptible constraint is the true constraint. It (sequence) ties us to the MIRI IFU which has the true PA constraint. Offset constraint must be revisisted for scheduled observation date to ensure correct overlap of MIRI imaging backgrounds

Diagnostics

(Visit 2:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(12)	NGG7023-BACKGROUND	RA: 21 02 46.9000 (315.6954167d) Dec: +68 14 7.00 (68.23528d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Blank field]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
F560W	All MRS	YES	FULL	NEUTRAL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F1000W	FASTR1	11	1	1	Dither 1	4	4	122.102	
1	LONG(C)	MRSLONG		FASTR1	11	1	1	Dither 1	4	4	122.102	
1	LONG(C)	MRSSHORT		FASTR1	11	1	1	Dither 1	4	4	122.102	
2		IMAGER	F770W	FASTR1	11	1	1	Dither 1	4	4	122.102	
2	MEDIUM(B)	MRSLONG		FASTR1	11	1	1	Dither 1	4	4	122.102	
2	MEDIUM(B)	MRSSHORT		FASTR1	11	1	1	Dither 1	4	4	122.102	
3		IMAGER	F560W	FASTR1	11	1	1	Dither 1	4	4	122.102	
3	SHORT(A)	MRSLONG		FASTR1	11	1	1	Dither 1	4	4	122.102	
3	SHORT(A)	MRSSHORT		FASTR1	11	1	1	Dither 1	4	4	122.102	

Special Requirements	
	Aperture PA Range 135 to 135 Degrees (V3 135.0 to 135.0) Sequence Observations 1, 2, 6, 7, Non-interruptible

Observation

Proposal 1192, Observation 8: NIRSpec IFU Filament1 Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observations:[NIRSpec IFU Background (Obs 9)]

Comments: Observation windows can be expanded by rotating the orient constraints by 90 degrees and exchanging the row and column mosaic configuration. The 233 degree orient constraint thereby obtained is accessible for a march 2021 launch.
Aperture PA constraint ensures that mosaic lies perpendicular to PDR front.

Diagnostics

(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(11)	NGC-7023-NW-FILAMENT	RA: 21 01 31.8800 (315.3828333d) Dec: +68 10 24.50 (68.17347d) Equinox: J2000		

Comments:
Category=ISM
Description=[Bright nebulae]

Template

TA Method
VERIFY_ONLY

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
6	1	10.0	0.0	0.0	0.0	DEFAULT

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	3	3	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLCLOSED	F110W	NRSRAPID	3	1	1	1	42.947

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	5	1	false	true	NONE	3	3	262.6	
2	G395M/F290LP	NRSIRS2RAPID	5	1	true	true	NONE	3	3	262.6	
3	G235M/F170LP	NRSIRS2RAPID	5	1	false	true	NONE	3	3	262.6	
4	G235M/F170LP	NRSIRS2RAPID	5	1	true	true	NONE	3	3	262.6	
5	G140M/F100LP	NRSIRS2RAPID	4	1	false	true	NONE	3	3	218.833	
6	G140M/F100LP	NRSIRS2RAPID	4	1	true	true	NONE	3	3	218.833	

Special Requirements

Aperture PA Range 143 to 143 Degrees (V3 4.02746582 to 4.02746582)
Aperture PA Range 323 to 323 Degrees (V3 184.02746582 to 184.02746582)

Sequence Observations 8, 9, Non-interruptible

Observation

Proposal 1192, Observation 9: NIRSpec IFU Background Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observation For: [NIRSpec IFU Filament1 (Obs 8)]

Comments: Offset constraint must be revisisted for scheduled observation date to ensure correct overlap of MIRI IFU backgrounds

Diagnostics

(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(12)	NGG7023-BACKGROUND	RA: 21 02 46.9000 (315.6954167d) Dec: +68 14 7.00 (68.23528d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Blank field]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	3	3	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2RAPID	5	1	false	true	NONE	3	3	262.6	
2	G395M/F290LP	NRSIRS2RAPID	5	1	true	true	NONE	3	3	262.6	
3	G235M/F170LP	NRSIRS2RAPID	5	1	false	true	NONE	3	3	262.6	
4	G235M/F170LP	NRSIRS2RAPID	5	1	true	true	NONE	3	3	262.6	
5	G140M/F100LP	NRSIRS2RAPID	4	1	false	true	NONE	3	3	218.833	
6	G140M/F100LP	NRSIRS2RAPID	4	1	true	true	NONE	3	3	218.833	

Special Requirements	Sequence Observations 8, 9, Non-interruptible

Observation

Proposal 1192, Observation 15: NIRCam Imaging Tue Sep 19 17:01:05 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Coordinated Parallel Template(s): MIRI Imaging

Comments: Aperture PA constraint is purely for accurate visualization in Aladin; Sequence non-interruptible constraint is the true constraint. It (sequence) ties us to the MIRI IFU which has the true PA constraint. We require the NIRCam imaging to be non-interuptible so that the parallel MIRI imaging background is contemporaneous with the MIRI observations.
Offset constraint ensures correct positioning of target on the NIRCam FOV relative to the pointing location at the center of the module B SW FPA
Offset constraint must be revisisted for scheduled observation date to ensure correct overlap of MIRI imaging backgrounds

Diagnostics

(Visit 15:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(15)	HORSEHEAD-FILAMENT-IMAGING	RA: 05 40 53.6500 (85.2235417d) Dec: -02 28 4.30 (-2.46786d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	

Comments:
Category=ISM
Description=[Photodissociation regions, Reflection nebulae]

Template

NIRCam Imaging	MIRI Imaging
Module: B	Subarray: FULL
Subarray: FULL	
Target Placement: Module Gap	

Dithers

#	Primary Dither Type	Primary Dithers	Dither Size	Subpixel Positions	Coordinated Parallel Subpixel Selector	Dither Direct Images Primes
1	NONE			1	3-POINT-WITH-MIRI-F560W	NO_DITHERING

Spectral Elements

NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F164N+F150W2	F323N+F322W2	SHALLOW4	10	1	3	3	1578.305	
2	F187N	F405N+F444W	SHALLOW4	10	1	3	3	1578.305	
3	F212N	F470N+F444W	SHALLOW4	10	1	3	3	1578.305	
4	F210M	F430M	SHALLOW4	7	1	3	3	1095.151	
5	F140M	F335M	SHALLOW4	7	1	3	3	1095.151	
6	F090W	F300M	SHALLOW4	7	1	3	3	1095.151	
7	F070W	F250M	SHALLOW4	7	1	3	3	1095.151	

Spectral Elements

MIRI Imaging	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F1800W	FASTR1	150	1	1		3	3	1248.768	
2	F2100W	FASTR1	150	1	1		3	3	1248.768	
3	F2550W	FASTR1	150	1	1		3	3	1248.768	
4	F1000W	FASTR1	125	1	1		3	3	1040.64	
5	F1130W	FASTR1	125	1	1		3	3	1040.64	
6	F1280W	FASTR1	125	1	1		3	3	1040.64	
7	F1500W	FASTR1	125	1	1		3	3	1040.64	

Special Requirements	
	Aperture PA Range 68 to 68 Degrees (V3 67.94416471 to 67.94416471) Offset 40.0 arcsec, 35.0 arcsec No Parallel Attachments Sequence Observations 10, 11, 14, 15, Non-interruptible

Observation

Proposal 1192, Observation 14: MIRI Imaging Tue Sep 19 17:01:06 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Comments: Aperture PA constraint is purely for accurate visualization in Aladin; Sequence non-interruptible constraint is the true constraint. It (sequence) ties us to the MIRI IFU which has the true PA constraint.
Offset constraint ensures correct positioning of target on the MIRI FOV
Offset constraint must be revisisted for scheduled observation date

Diagnostics

(Visit 14:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(15)	HORSEHEAD-FILAMENT-IMAGING	RA: 05 40 53.6500 (85.2235417d) Dec: -02 28 4.30 (-2.46786d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	

Comments:
Category=ISM
Description=[Photodissociation regions, Reflection nebulae]

Template

Subarray
FULL

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	1	3		6	1			DEFAULT

Spectral Elements

#	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F560W	FASTR1	12	1	1	Dither 1	3	3	99.901	
2	F770W	FASTR1	12	1	1	Dither 1	3	3	99.901	
3	F1000W	FASTR1	12	1	1	Dither 1	3	3	99.901	
4	F1130W	FASTR1	12	1	1	Dither 1	3	3	99.901	
5	F1280W	FASTR1	12	1	1	Dither 1	3	3	99.901	
6	F1500W	FASTR1	12	1	1	Dither 1	3	3	99.901	
7	F1800W	FASTR1	12	1	1	Dither 1	3	3	99.901	
8	F2100W	FASTR1	12	1	1	Dither 1	3	3	99.901	
9	F2550W	FASTR1	12	1	1	Dither 1	3	3	99.901	

Special Requirements	
	Aperture PA Range 68 to 68 Degrees (V3 63.16455103 to 63.16455103) Sequence Observations 10, 11, 14, 15, Non-interruptible

Observation

Proposal 1192, Observation 10: MIRI IFU Filament1 Tue Sep 19 17:01:06 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI IFU Background (Obs 11)]

Comments: Observation windows can be expanded by rotating the orient constraints by 90 degrees and exchanging the row and column mosaic configuration. However, those orients are not available for this target. Aperature PA constraint ensures that mosaic lies perpendicular to PDR front.

Diagnostics

(Visit 10:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	HORSEHEAD-FILAMENT	RA: 05 40 53.6500 (85.2235417d) Dec: -02 28 4.30 (-2.46786d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	

Comments:
Category=ISM
Description=[Photodissociation regions, Reflection nebulae]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
F560W	All MRS	YES	FULL	NEUTRAL

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
6	1	10.0	10.0	0.0	0.0	DEFAULT

Dithers

#	Dither Type	Optimized For	Direction
1	2-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F560W	FASTR1	26	1	1	Dither 1	2	2	144.302	
1	SHORT(A)	MRSLONG		FASTR1	26	1	1	Dither 1	2	2	144.302	
1	SHORT(A)	MRSSHORT		FASTR1	26	1	1	Dither 1	2	2	144.302	
2		IMAGER	F770W	FASTR1	26	1	1	Dither 1	2	2	144.302	
2	MEDIUM(B)	MRSLONG		FASTR1	26	1	1	Dither 1	2	2	144.302	
2	MEDIUM(B)	MRSSHORT		FASTR1	26	1	1	Dither 1	2	2	144.302	
3		IMAGER	F1000W	FASTR1	26	1	1	Dither 1	2	2	144.302	
3	LONG(C)	MRSLONG		FASTR1	26	1	1	Dither 1	2	2	144.302	
3	LONG(C)	MRSSHORT		FASTR1	26	1	1	Dither 1	2	2	144.302	

Special Requirements

Aperture PA Range 68 to 68 Degrees (V3 68.0 to 68.0)

Sequence Observations 10, 11, 14, 15, Non-interruptible

Observation

Proposal 1192, Observation 11: MIRI IFU Background Tue Sep 19 17:01:06 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI IFU Filament1 (Obs 10)]

Comments: Aperture PA constraint is purely for accurate visualization in Aladin; Sequence non-interruptible constraint is the true constraint. It (sequence) ties us to the MIRI IFU which has the true PA constraint. Offset constraint must be revisisted for scheduled observation date to ensure correct overlap of MIRI imaging backgrounds

Diagnostics

(Visit 11:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(14)	HORSEHEAD-BACKGROUND	RA: 05 40 51.0000 (85.2125000d) Dec: -02 21 26.00 (-2.35722d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	

Comments:
Category=ISM
Description=[Photodissociation regions, Reflection nebulae]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
F560W	All MRS	YES	FULL	NEUTRAL

Dithers

#	Dither Type	Optimized For	Direction
1	2-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1		IMAGER	F560W	FASTR1	26	1	1	Dither 1	2	2	144.302	
1	SHORT(A)	MRSLONG		FASTR1	26	1	1	Dither 1	2	2	144.302	
1	SHORT(A)	MRSSHORT		FASTR1	26	1	1	Dither 1	2	2	144.302	
2		IMAGER	F770W	FASTR1	26	1	1	Dither 1	2	2	144.302	
2	MEDIUM(B)	MRSLONG		FASTR1	26	1	1	Dither 1	2	2	144.302	
2	MEDIUM(B)	MRSSHORT		FASTR1	26	1	1	Dither 1	2	2	144.302	
3		IMAGER	F1000W	FASTR1	26	1	1	Dither 1	2	2	144.302	
3	LONG(C)	MRSLONG		FASTR1	26	1	1	Dither 1	2	2	144.302	
3	LONG(C)	MRSSHORT		FASTR1	26	1	1	Dither 1	2	2	144.302	

Special Requirements	
	Aperture PA Range 68 to 68 Degrees (V3 68.0 to 68.0) Sequence Observations 10, 11, 14, 15, Non-interruptible

Observation

Proposal 1192, Observation 16: NIRSpec IFU Filament1 Tue Sep 19 17:01:06 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observations:[NIRSpec IFU Background (Obs 17)]

Comments: Observation windows can be expanded by rotating the orient constraints by 90 degrees and exchanging the row and column mosaic configuration. However, those orients are not available for this target. Aperature PA constraint ensures that mosaic lies perpendicular to PDR front.

Diagnostics

(Visit 16:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 16:1) 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
(2)	HORSEHEAD-FILAMENT	RA: 05 40 53.6500 (85.2235417d) Dec: -02 28 4.30 (-2.46786d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	

Comments:
Category=ISM
Description=[Photodissociation regions, Reflection nebulae]

Template

TA Method
VERIFY_ONLY

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
6	1	10.0	0.0	0.0	0.0	DEFAULT

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	3	3	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLCLOSED	F110W	NRSRAPID	3	1	1	1	42.947

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2	4	1	false	true	NONE	3	3	919.1	
2	G395M/F290LP	NRSIRS2	4	1	true	true	NONE	3	3	919.1	
3	G235M/F170LP	NRSIRS2	4	1	false	true	NONE	3	3	919.1	
4	G235M/F170LP	NRSIRS2	4	1	true	true	NONE	3	3	919.1	
5	G140M/F100LP	NRSIRS2	4	1	false	true	NONE	3	3	919.1	
6	G140M/F100LP	NRSIRS2	4	1	true	true	NONE	3	3	919.1	

Special Requirements

Aperture PA Range 76 to 76 Degrees (V3 297.02746582 to 297.02746582)

Sequence Observations 16, 17, Non-interruptible

Observation

Proposal 1192, Observation 17: NIRSpec IFU Background Tue Sep 19 17:01:06 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observation For: [NIRSpec IFU Filament1 (Obs 16)]

Comments: Offset constraint must be revisisted for scheduled observation date to ensure correct overlap of MIRI IFU backgrounds

Diagnostics

(Visit 17:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(14)	HORSEHEAD-BACKGROUND	RA: 05 40 51.0000 (85.2125000d) Dec: -02 21 26.00 (-2.35722d) Equinox: J2000	Proper Motion RA: 0 Proper Motion Dec: 0 Parallax: 0" Epoch of Position: 2000	

Comments:
Category=ISM
Description=[Photodissociation regions, Reflection nebulae]

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	3	3	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395M/F290LP	NRSIRS2	4	1	false	true	NONE	3	3	919.1	
2	G395M/F290LP	NRSIRS2	4	1	true	true	NONE	3	3	919.1	
3	G235M/F170LP	NRSIRS2	4	1	false	true	NONE	3	3	919.1	
4	G235M/F170LP	NRSIRS2	4	1	true	true	NONE	3	3	919.1	
5	G140M/F100LP	NRSIRS2	4	1	false	true	NONE	3	3	919.1	
6	G140M/F100LP	NRSIRS2	4	1	true	true	NONE	3	3	919.1	

Special Requirements

Sequence Observations 16, 17, Non-interruptible