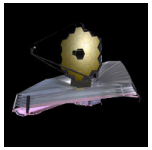

2727 - JWST Early Release Observation 1

Cycle: 0, Proposal Category: COM/ERO

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Imaging				
	2	Cartwheel NIRCam Imaging	NIRCam Imaging	(62) NAME-CARTWHEEL
	1	Cartwheel MIRI Imaging	MIRI Imaging	(62) NAME-CARTWHEEL
	7	Cartwheel MIRI Imaging	MIRI Imaging	(62) NAME-CARTWHEEL
Spectroscopy				
	6	Cartwheel NIRSpec IFU	NIRSpec IFU Spectroscopy	(63) NAME-CARTWHEEL-CORE

ABSTRACT

ERO observation of the Cartwheel interacting galaxy. This contains NIRCam and MIRI imaging, as well as a NIRSpec IFU pointing on the galaxy core.

OBSERVING DESCRIPTION

ERO of the interacting Cartwheel galaxy at z=0.0297

NIRCam imaging

NIRCam imaging of the cartwheel and impactor (G2). The scene is relatively compact, so only the B module is needed. 6 NIRCam filters are chosen. Since the redshift of the merger is large enough that narrow-band filters are not usable, wide filters are used spanning a wide range in wavelength: F090W, F150W, F200W, F277W, F356W, F444W. While the final image product will aim to be as square as possible, the intramodule (not intramodulebox) dither is used to get as uniform depth coverage as possible in the center of the FOV in the SW channel. We drive the exposure parameters by a need to maximize dynamic range (high sensitivity, but without saturating too many brighter sources). The Cartwheel is actually a quite low surface brightness galaxy, with 3-10 micron maximum surface brightness in the range 1-5 MJy/sr. It is possible some of this will be resolved into brighter clumps, but we estimate performance assuming extended emission. The imaging has a depth that will yield SNR>5 per pixel in the faintest 0.05 MJy/sr areas, reaching SNR>80 in the brighest areas. We are not close to saturating on any of the brightest parts.

MIRI imaging

MIRI imaging of the entire merger, and the likely impactor. For MIRI we use 4 filters, F770W, F1000W, F1280W, and F1800W, to trace PAHs, silicate absorption, and the most embedded star-forming clusters. We use 8 dither points using the large cycling pattern to maximize the spatial coverage of a single tile (at the expense of some variable depth coverage on the edges). Saturation on the target is not an issue, but we keep the F1800W to 30 groups to avoid saturating on the background. Expected SNR on the brighter sources is >50 at F770W, >25 at F1280W, and >20 at F1800W in the very red "hot spot" and G2.

NIRSpec IFU

NIRSpec IFU of the core of the cartwheel. We use the PRISM for maximal sensitivity and spectral range. The cartwheel core is not very bright, so saturation is not an issue. Expected SNR is >10 per spaxel per channel average (but much more in emission lines from star-formation activity).

NOTE: We do not include MIRI MRS of any part of the cartwheel, as it is too faint (SNR~2-4 in 1 hour).

Update 11/13/2021

- Changed to SHALLOW2 dither pattern
- Added integration to F1800W, adjusted ramps for other MIRI to slightly decrease total time.
- Added PA constraint to match likely observing date
- Increased MIRI tile overlap to 20%

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(62)	NAME-CARTWHEEL	RA: 00 37 41.8982 (9.4245758d) Dec: -33 42 37.47 (-33.71041d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Interacting galaxies]*				
(63)	NAME-CARTWHEEL-CORE	RA: 00 37 41.1010 (9.4212542d) Dec: -33 42 58.56 (-33.71627d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Interacting galaxies]*				

Observation

Proposal 2727, Observation 2: Cartwheel NIRCam Imaging Fri Jun 10 20:00:47 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

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
(62)	NAME-CARTWHEEL	RA: 00 37 41.8982 (9.4245758d) Dec: -33 42 37.47 (-33.71041d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Interacting galaxies]

Template

Module	Subarray
B	FULL

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	INTRAMODULEBOX	8	STANDARD		1

Spectral Elements

#	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F090W	F277W	SHALLOW2	7	1	8	8	2748.613	
2	F150W	F356W	SHALLOW2	7	1	8	8	2748.613	
3	F200W	F444W	SHALLOW2	7	1	8	8	2748.613	

Special Requirements

Aperture PA Range 242.02984889 to 244.02984889 Degrees (V3 242.00412617 to 244.00412617)

Observation

Proposal 2727, Observation 1: Cartwheel MIRI Imaging Fri Jun 10 20:00:47 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(62)	NAME-CARTWHEEL	RA: 00 37 41.8982 (9.4245758d) Dec: -33 42 37.47 (-33.71041d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Interacting galaxies]

Template

Subarray
FULL

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift	Column shift	Tile Order
1	2	20.0	20.0	0.0	0.0	DEFAULT

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	1	8		1	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	F770W	FASTR1	45	2	1	Dither 1	8	16	2020.229	
2	F1000W	FASTR1	45	2	1	Dither 1	8	16	2020.229	
3	F1280W	FASTR1	45	2	1	Dither 1	8	16	2020.229	
4	F1800W	FASTR1	30	3	1	Dither 1	8	24	2042.429	

Special Requirements

Group Visits within 53.0 Days
Aperture PA Range 246.83425324 to 248.83425324 Degrees (V3 241.99880427 to 243.99880427)
Visits Same PA
Offset -5.5743020101392275 arcsec, -7.395943887807814 arcsec

Observation

Proposal 2727, Observation 7: Cartwheel MIRI Imaging Fri Jun 10 20:00:47 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Imaging

Diagnostics

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

(Visit 7:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(62)	NAME-CARTWHEEL	RA: 00 37 41.8982 (9.4245758d) Dec: -33 42 37.47 (-33.71041d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Interacting galaxies]

Template

Subarray
FULL

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift	Column shift	Tile Order
1	2	20.0	20.0	0.0	0.0	DEFAULT

Dithers

#	Dither Type	Starting Point	Number of Points	Points	Starting Set	Number of Sets	Optimized For	Direction	Pattern Size
1	CYCLING	1	8		1	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	F770W	FASTR1	45	2	1	Dither 1	8	16	2020.229	
2	F1000W	FASTR1	45	2	1	Dither 1	8	16	2020.229	
3	F1280W	FASTR1	45	2	1	Dither 1	8	16	2020.229	
4	F1800W	FASTR1	30	3	1	Dither 1	8	24	2042.429	

Special Requirements

Group Visits within 53.0 Days
Aperture PA Range 246.83425324 to 248.83425324 Degrees (V3 241.99880427 to 243.99880427)
Visits Same PA
Offset -5.5743020101392275 arcsec, -7.395943887807814 arcsec

Observation

Proposal 2727, Observation 6: Cartwheel NIRSpec IFU Fri Jun 10 20:00:47 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

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
(63)	NAME-CARTWHEEL-CORE	RA: 00 37 41.1010 (9.4212542d) Dec: -33 42 58.56 (-33.71627d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Interacting galaxies]

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	LARGE	1	6	

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	PRISM/CLEAR	NRSIRS2RAPID	20	1	false	true	NONE	6	6	1838.2	