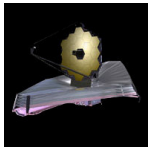

6987 - Unveiling Eta Carinae's Eruptive Mass-Loss History with JWST Spectroscopy

Cycle: 4, Proposal Category: GO

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	17	MIRI MRS centered on EtaCar-E	MIRI Medium Resolution Spectroscopy	(9) ETA-CAR-MIRI-E
	18	MIRI MRS centered on EtaCar-W	MIRI Medium Resolution Spectroscopy	(10) ETA-CAR-MIRI-W
	7	MIRI MRS Background E	MIRI Medium Resolution Spectroscopy	(4) ETACAR-BACK-E

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	22	MIRI MRS Background ODF	MIRI Medium Resolution Spectroscopy	(14) ETACAR-BACK-ODF
	23	MIRI MRS Background W	MIRI Medium Resolution Spectroscopy	(13) ETACAR-BACK-W
	11	MIRI MRS ODF E5	MIRI Medium Resolution Spectroscopy	(5) ODF-E5-MIRI
	2	NIRSPEC IFU ODF E5	NIRSpec IFU Spectroscopy	(15) ODF-E5-NIRSpec
	3	NIRSPEC IFU ODF COND	NIRSpec IFU Spectroscopy	(6) ODF-S-COND
	1	NIRSPEC IFU BACK	NIRSpec IFU Spectroscopy	(16) ETACAR-BACK-E-NIRspec
	19	NIRSpecIFU SE mosaic	NIRSpec IFU Spectroscopy	(11) SE-LOBE-NIRSpec-Mosaic
	20	NIRSpecIFU NW mosaic	NIRSpec IFU Spectroscopy	(12) NW-LOBE-NIRSpec-mosaic
	21	FS Mosaic center/butterfly	NIRSpec Fixed Slit Spectroscopy	(1) -ETA-CAR
	31	FS Mosaic center/butterfly - Repeat of obs 21	NIRSpec Fixed Slit Spectroscopy	(1) -ETA-CAR

ABSTRACT

The Luminous Blue Variable Eta Carinae is a colliding-wind binary, the most massive stellar multiple within 3 kpc, and a strong candidate for a merger in a born-triple system. Its spectacular bipolar 10" x 20" Homunculus Nebula, formed in the "Great Eruption" in the 1840s, is postulated to have been ejected in a super-Eddington wind during the spiral-in phase of two merging stars. The nitrogen-rich nebula contains at least 0.4 Msun of dust, with a diverse chemistry reflecting the CNO-processed abundance pattern of the erupting star's surface. However, the mass and chemical distribution of the dust between the polar lobes and a warm wind-carved equatorial torus -- tracers of the system's mass-loss history -- are highly uncertain since the only spectrum revealing the unique dust bands is spatially unresolved. We propose to decisively fill this crucial gap in our knowledge with JWST spectral maps of the nebula and two positions in the nearby debris field containing N-rich material ejected centuries before the Great Eruption, possibly during an unstable triple orbit phase involving mass-stripping encounters. The dust bands and nebular lines provide essential diagnostics of the distribution of dust species, grain properties, and associated excitation conditions, and will constrain the dynamical models of the system with the mass budget over the its eruptive history, and provide a detailed understanding of the photon- and shock-driven gas excitation. The science unique to JWST's capabilities will offer insights into key processes like common-envelope evolution, a critical yet poorly-understood phase in the formation of gravitational wave sources.

OBSERVING DESCRIPTION

We propose to perform NIRSpec and MIRI MRS IFU spectroscopy on the dusty 10" x 20" Homunculus Nebula and nearby debris fields surrounding the Luminous Blue Variable and candidate merger-in-a-triple eta Carinae. The observations on the Homunculus are designed as mosaics providing maximum wavelength coverage over the full nebula to separate the various anticipated dust bands, nebular and recombination lines in the complex geometry of the disrupted equatorial torus, the equatorial skirt, and bipolar lobes to characteristic clumping scales of ~0.2". Two positions target pre-Great Eruption material in the surrounding debris field for spectroscopy with a single pointing of the IFUs.

The NIRSpec G140H/F100LP, G235H/170LP, and G395H/290LP disperser-filter combinations are used to cover emission from hot dust, nebular and reflected recombination H and He, fine structure lines, and ro-vibrational H2 which will trace photon- and shock-excited material in the Homunculus and X-ray bright ring of the outer ejecta. The plentiful spectral lines will prevent IFU wavelength gaps from interfering with our science goals. High spectral resolution will also moderate throughput from the bright central region of the Homunculus, avoiding saturation according to our senstivitiy estimates with ETC 4.0. MSA leak-cals are included with the NIRSpec IFU science observations.

The MIRI MRS observations employ all 4 channels to similarly cover warm and cooler dust species across the nebula, H and He lines, and key fine-structure lines to trace where molecule and dust formation is inhibited. Group numbers are set to 6, minimizing persistence and saturation risks based on ETC 4.0 sensitivity calculations, ground-based imaging between 0.658 and 19.5 microns, and SED shape indicated by spatially-unresolved ISO spectroscopy of the Homunculus.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	-ETA-CAR	RA: 10 45 3.5378 (161.2647408d) Dec: -59 41 4.05 (-59.68446d) Equinox: J2000	Proper Motion RA: -11 mas/yr Proper Motion Dec: 4.1 mas/yr Epoch of Position: 2016.0	
Comments: Updated to use Gaia DR3 position. Gaia DR3 does not provide any proper motions for this target, so we have adopted UCAC4 proper mostion but with the Gaia DR3 position at 2016.0 as the reference. The UCAC4 motion looks real, but it isn't clear if it was measuring the central star or some other ejected material. The uncertainty as to whether or not to include the proper motion probably adds ~ 0.1" to the final positional uncertainty. *Category=Star* *Description=[Eta Carinae stars]* *Extended=YES*				
(4)	ETACAR-BACK-E	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0	
Comments: *Category=Calibration* *Description=[Telescope/sky background]* *Extended=YES*				
(5)	ODF-E5-MIRI	RA: 10 45 7.0200 (161.2792500d) Dec: -59 41 12.30 (-59.68675d) Equinox: J2000	Proper Motion RA: 50.0 mas/yr Proper Motion Dec: -19.0 mas/yr Epoch of Position: 2000.0	
Comments: *Category=ISM* *Description=[High-velocity clouds]* *Extended=YES*				
(6)	ODF-S-COND	RA: 10 45 2.4000 (161.2600000d) Dec: -59 41 7.30 (-59.68536d) Equinox: J2000	Proper Motion RA: -48.0 mas/yr Proper Motion Dec: -6.0 mas/yr Epoch of Position: 2000	
Comments: *Category=ISM* *Description=[High-velocity clouds]* *Extended=YES*				
(9)	ETA-CAR-MIRI-E	RA: 10 45 4.0240 (161.2667667d) Dec: -59 41 7.36 (-59.68538d) Equinox: J2000	Proper Motion RA: -0.0014528297321410096 sec of time/yr Proper Motion Dec: 0.0040999999999999995 arcsec/yr Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Eta Carinae stars]* *Extended=YES*				
(10)	ETA-CAR-MIRI-W	RA: 10 45 3.0680 (161.2627833d) Dec: -59 41 0.39 (-59.68344d) Equinox: J2000	Proper Motion RA: -0.0014528297321410096 sec of time/yr Proper Motion Dec: 0.0040999999999999995 arcsec/yr Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Star* *Description=[Eta Carinae stars]* *Extended=YES*				

(11)	SE-LOBE-NIRSpec-Mosaic	RA: 10 45 3.7098 (161.2654575d) Dec: -59 41 5.01 (-59.68473d) Equinox: J2000	
Comments: *Category=ISM* *Description=[Emission nebulae]* *Extended=YES*			
(12)	NW-LOBE-NIRSpec-mosaic	RA: 10 45 3.3741 (161.2640588d) Dec: -59 41 2.97 (-59.68416d) Equinox: J2000	
Comments: *Category=ISM* *Description=[Emission nebulae]* *Extended=YES*			
(13)	ETACAR-BACK-W	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0
Comments: *Category=Calibration* *Description=[Telescope/sky background]* *Extended=YES*			
(14)	ETACAR-BACK-ODF	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0
Comments: *Category=Calibration* *Description=[Telescope/sky background]* *Extended=YES*			
(15)	ODF-E5-NIRSpec	RA: 10 45 7.0200 (161.2792500d) Dec: -59 41 12.30 (-59.68675d) Equinox: J2000	Proper Motion RA: 50.0 mas/yr Proper Motion Dec: -19.0 mas/yr Epoch of Position: 2000.0
Comments: *Category=ISM* *Description=[High-velocity clouds]* *Extended=YES*			
(16)	ETACAR-BACK-E-NIRspec	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0
Comments: *Category=Calibration* *Description=[Telescope/sky background]* *Extended=YES*			

Observation

Proposal 6987, Observation 17: MIRI MRS centered on EtaCar-E Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI MRS Background E (Obs 7)]

Diagnostics

(MIRI MRS centered on EtaCar-E (Obs 17)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS centered on EtaCar-E (Obs 17)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS centered on EtaCar-E (Obs 17)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(9)	ETA-CAR-MIRI-E	RA: 10 45 4.0240 (161.2667667d) Dec: -59 41 7.36 (-59.68538d) Equinox: J2000	Proper Motion RA: -0.0014528297321410096 sec of time/yr Proper Motion Dec: 0.0040999999999999995 arcsec/yr Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Eta Carinae stars]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
2	2	15.0	15.0	0.0	0.0	ROW_ORDER

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	Optional ETC ID
1		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
1	SHORT(A)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
1	SHORT(A)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
2		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
2	MEDIUM(B)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
2	MEDIUM(B)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
3		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
3	LONG(C)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
3	LONG(C)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	

Special Requirements

Aperture PA Range 310 to 350 Degrees (V3 310.0 to 350.0)

Sequence Observations 7, 17, Non-interruptible

Observation

Proposal 6987, Observation 18: MIRI MRS centered on EtaCar-W Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI MRS Background W (Obs 23)]

Diagnostics

(MIRI MRS centered on EtaCar-W (Obs 18)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS centered on EtaCar-W (Obs 18)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS centered on EtaCar-W (Obs 18)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(Visit 18:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(10)	ETA-CAR-MIRI-W	RA: 10 45 3.0680 (161.2627833d) Dec: -59 41 0.39 (-59.68344d) Equinox: J2000	Proper Motion RA: -0.0014528297321410096 sec of time/yr Proper Motion Dec: 0.0040999999999999995 arcsec/yr Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Star
Description=[Eta Carinae stars]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
2	2	15.0	15.0	0.0	0.0	ROW_ORDER

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	Optional ETC ID
1		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
1	SHORT(A)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
1	SHORT(A)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
2		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
2	MEDIUM(B)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
2	MEDIUM(B)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
3		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
3	LONG(C)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
3	LONG(C)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	

Special Requirements

Aperture PA Range 37 to 80 Degrees (V3 37.0 to 80.0)

Sequence Observations 23, 18 (reordered), Non-interruptible

Observation

Proposal 6987, Observation 7: MIRI MRS Background E Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI MRS centered on EtaCar-E (Obs 17)]

Diagnostics

(MIRI MRS Background E (Obs 7)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS Background E (Obs 7)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS Background E (Obs 7)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	ETACAR-BACK-E	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0	

Comments:
Category=Calibration
Description=[Telescope/sky background]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

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	Optional ETC ID
1		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
1	SHORT(A)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
1	SHORT(A)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
2		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
2	MEDIUM(B)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
2	MEDIUM(B)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
3		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
3	LONG(C)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
3	LONG(C)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	

Special Requirements	Sequence Observations 7, 17, Non-interruptible

Observation

Proposal 6987, Observation 22: MIRI MRS Background ODF Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI MRS ODF E5 (Obs 11)]

Diagnostics

(Visit 22:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(14)	ETACAR-BACK-ODF	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0	

Comments:
Category=Calibration
Description=[Telescope/sky background]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

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	Optional ETC ID
1		IMAGER	F560W	FASTR1	5	1	1	Dither 1	4	4	55.501	
1	LONG(C)	MRSLONG		FASTR1	10	1	1	Dither 1	4	4	111.002	
1	LONG(C)	MRSSHORT		FASTR1	10	1	1	Dither 1	4	4	111.002	
2		IMAGER	F560W	FASTR1	5	1	1	Dither 1	4	4	55.501	
2	MEDIUM(B)	MRSLONG		FASTR1	10	1	1	Dither 1	4	4	111.002	
2	MEDIUM(B)	MRSSHORT		FASTR1	10	1	1	Dither 1	4	4	111.002	
3		IMAGER	F560W	FASTR1	5	1	1	Dither 1	4	4	55.501	
3	SHORT(A)	MRSLONG		FASTR1	10	1	1	Dither 1	4	4	111.002	
3	SHORT(A)	MRSSHORT		FASTR1	10	1	1	Dither 1	4	4	111.002	

Special Requirements	Group Observations 11, 22, Non-interruptible

Observation

Proposal 6987, Observation 23: MIRI MRS Background W Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI MRS centered on EtaCar-W (Obs 18)]

Diagnostics

(MIRI MRS Background W (Obs 23)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS Background W (Obs 23)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(MIRI MRS Background W (Obs 23)) Warning (Form): Groups/Int cannot be 1, Groups/Int = 2 requires permission and Groups/Int of 3-4 is allowed but not recommended.

(Visit 23:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(13)	ETACAR-BACK-W	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0	

Comments:
Category=Calibration
Description=[Telescope/sky background]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

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	Optional ETC ID
1		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
1	SHORT(A)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
1	SHORT(A)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
2		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
2	MEDIUM(B)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
2	MEDIUM(B)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	
3		IMAGER	F560W	FASTR1	3	1	1	Dither 1	4	4	33.3	
3	LONG(C)	MRSLONG		FASTR1	6	1	1	Dither 1	4	4	66.601	
3	LONG(C)	MRSSHORT		FASTR1	6	1	1	Dither 1	4	4	66.601	

Special Requirements	Sequence Observations 23, 18 (reordered), Non-interruptible

Observation

Proposal 6987, Observation 11: MIRI MRS ODF E5 Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI MRS Background ODF (Obs 22)]

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
(5)	ODF-E5-MIRI	RA: 10 45 7.0200 (161.2792500d)	Proper Motion RA: 50.0 mas/yr	
		Dec: -59 41 12.30 (-59.68675d)	Proper Motion Dec: -19.0 mas/yr	
		Equinox: J2000	Epoch of Position: 2000.0	

Comments:
Category=ISM
Description=[High-velocity clouds]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

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	Optional ETC ID
1		IMAGER	F560W	FASTR1	5	1	1	Dither 1	4	4	55.501	
1	LONG(C)	MRSLONG		FASTR1	10	1	1	Dither 1	4	4	111.002	
1	LONG(C)	MRSSHORT		FASTR1	10	1	1	Dither 1	4	4	111.002	
2		IMAGER	F560W	FASTR1	5	1	1	Dither 1	4	4	55.501	
2	MEDIUM(B)	MRSLONG		FASTR1	10	1	1	Dither 1	4	4	111.002	
2	MEDIUM(B)	MRSSHORT		FASTR1	10	1	1	Dither 1	4	4	111.002	
3		IMAGER	F560W	FASTR1	5	1	1	Dither 1	4	4	55.501	
3	SHORT(A)	MRSLONG		FASTR1	10	1	1	Dither 1	4	4	111.002	
3	SHORT(A)	MRSSHORT		FASTR1	10	1	1	Dither 1	4	4	111.002	

Special Requirements	Group Observations 11, 22, Non-interruptible

Observation

Proposal 6987, Observation 2: NIRSPEC IFU ODF E5 Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observations:[NIRSPEC IFU BACK (Obs 1)]

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
(15)	ODF-E5-NIRSpec	RA: 10 45 7.0200 (161.2792500d)	Proper Motion RA: 50.0 mas/yr	
		Dec: -59 41 12.30 (-59.68675d)	Proper Motion Dec: -19.0 mas/yr	
		Equinox: J2000	Epoch of Position: 2000.0	

Comments:
Category=ISM
Description=[High-velocity clouds]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	SPARSE-CYCLING	MEDIUM			1,2

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F100LP	NRSIRS2RAPID	15	1	true	true	NONE	2	2	466.844	143984
2	G140H/F100LP	NRSIRS2RAPID	15	1	false	true	NONE	2	2	466.844	143984
3	G235H/F170LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	143984
4	G235H/F170LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	143984
5	G395H/F290LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	143984
6	G395H/F290LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	143984

Special Requirements	Group Observations 1, 2, 3, Non-interruptible

Observation

Proposal 6987, Observation 3: NIRSPEC IFU ODF COND Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(6)	ODF-S-COND	RA: 10 45 2.4000 (161.2600000d) Dec: -59 41 7.30 (-59.68536d) Equinox: J2000	Proper Motion RA: -48.0 mas/yr Proper Motion Dec: -6.0 mas/yr Epoch of Position: 2000	

Comments:
Category=ISM
Description=[High-velocity clouds]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	SPARSE-CYCLING	MEDIUM			1,2

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F100LP	NRSIRS2RAPID	15	1	true	true	NONE	2	2	466.844	143984
2	G140H/F100LP	NRSIRS2RAPID	15	1	false	true	NONE	2	2	466.844	143984
3	G235H/F170LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	143984
4	G235H/F170LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	143984
5	G395H/F290LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	143984
6	G395H/F290LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	143984

Special Requirements	Group Observations 1, 2, 3, Non-interruptible

Observation

Proposal 6987, Observation 1: NIRSPEC IFU BACK Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observation For: [NIRSPEC IFU ODF E5 (Obs 2)]

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
(16)	ETACAR-BACK-E-NIRspec	RA: 10 43 58.6400 (160.9943333d) Dec: -59 47 20.22 (-59.78895d) Equinox: J2000	Epoch of Position: 2000.0	

Comments:
Category=Calibration
Description=[Telescope/sky background]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	SPARSE-CYCLING	MEDIUM			1,2

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F100LP	NRSIRS2RAPID	15	1	true	true	NONE	2	2	466.844	143984
2	G140H/F100LP	NRSIRS2RAPID	15	1	false	true	NONE	2	2	466.844	143984
3	G235H/F170LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	143984
4	G235H/F170LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	143984
5	G395H/F290LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	143984
6	G395H/F290LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	143984

Special Requirements	Group Observations 1, 2, 3, Non-interruptible

Observation

Proposal 6987, Observation 19: NIRSpecIFU SE mosaic Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 19:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(11)	SE-LOBE-NIRSpec-Mosaic	RA: 10 45 3.7098 (161.2654575d) Dec: -59 41 5.01 (-59.68473d) Equinox: J2000		

Comments:
Category=ISM
Description=[Emission nebulae]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
4	6	3.3	3.3	0.0	0.0	COLUMN_ORDER

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	SPARSE-CYCLING	SMALL			1,2

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F100LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	
2	G140H/F100LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	
3	G235H/F170LP	NRSIRS2RAPID	3	1	false	true	NONE	2	2	116.711	
4	G235H/F170LP	NRSIRS2RAPID	3	1	true	true	NONE	2	2	116.711	
5	G395H/F290LP	NRSIRS2RAPID	2	1	false	true	NONE	2	2	87.533	
6	G395H/F290LP	NRSIRS2RAPID	2	1	true	true	NONE	2	2	87.533	

Special Requirements	
	Aperture PA Range 149.97164917 to 287.97164917 Degrees (V3 11.0 to 149.0) No Parallel Attachments Same Aperture PA 19, 20, 21 (V3 PAs differ)

Observation

Proposal 6987, Observation 20: NIRSpecIFU NW mosaic Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 20:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(12)	NW-LOBE-NIRSpec-mosaic	RA: 10 45 3.3741 (161.2640588d) Dec: -59 41 2.97 (-59.68416d) Equinox: J2000		

Comments:
Category=ISM
Description=[Emission nebulae]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
4	6	3.3	3.3	0.0	0.0	COLUMN_ORDER

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	SPARSE-CYCLING	SMALL			1,2

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F100LP	NRSIRS2RAPID	5	1	false	true	NONE	2	2	175.067	
2	G140H/F100LP	NRSIRS2RAPID	5	1	true	true	NONE	2	2	175.067	
3	G235H/F170LP	NRSIRS2RAPID	3	1	false	true	NONE	2	2	116.711	
4	G235H/F170LP	NRSIRS2RAPID	3	1	true	true	NONE	2	2	116.711	
5	G395H/F290LP	NRSIRS2RAPID	2	1	false	true	NONE	2	2	87.533	
6	G395H/F290LP	NRSIRS2RAPID	2	1	true	true	NONE	2	2	87.533	

Special Requirements	
	No Parallel Attachments Same Aperture PA 19, 20, 21 (V3 PAs differ)

Observation

Proposal 6987, Observation 21: FS Mosaic center/butterfly Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

Diagnostics

(Visit 21:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	-ETA-CAR	RA: 10 45 3.5378 (161.2647408d)	Proper Motion RA: -11 mas/yr	
		Dec: -59 41 4.05 (-59.68446d)	Proper Motion Dec: 4.1 mas/yr	
		Equinox: J2000	Epoch of Position: 2016.0	

Comments: Updated to use Gaia DR3 position. Gaia DR3 does not provide any proper motions for this target, so we have adopted UCAC4 proper mostion but with the Gaia DR3 position at 2016.0 as the reference. The UCAC4 motion looks real, but it isn't clear if it was measuring the central star or some other ejected material. The uncertainty as to whether or not to include the proper motion probably adds ~ 0.1" to the final positional uncertainty.
Category=Star
Description=[Eta Carinae stars]
Extended=YES

Template

TA Method	HFF Readout Mode	Slit	Subarray
NONE	false	S200A1	SUBS200A1

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
3	18	10.0	0.0	0.0	0.0	ROW_ORDER

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	3	NONE

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F070LP	S200A1	NRSRAPID	4	4	1	NONE	3	12	93.726	
2	G235H/F170LP	S200A1	NRSRAPID	3	4	2	NONE	3	12	75.03	
3	G395H/F290LP	S200A1	NRSRAPID	2	4	3	NONE	3	12	56.334	

Special Requirements	
	No Parallel Attachments Same Aperture PA 19, 20, 21 (V3 PAs differ)

Observation

Proposal 6987, Observation 31: FS Mosaic center/butterfly - Repeat of obs 21 Mon Mar 23 20:00:24 GMT 2026

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

Diagnostics

(Visit 31:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	-ETA-CAR	RA: 10 45 3.5378 (161.2647408d)	Proper Motion RA: -11 mas/yr	
		Dec: -59 41 4.05 (-59.68446d)	Proper Motion Dec: 4.1 mas/yr	
		Equinox: J2000	Epoch of Position: 2016.0	

Comments: Updated to use Gaia DR3 position. Gaia DR3 does not provide any proper motions for this target, so we have adopted UCAC4 proper mostion but with the Gaia DR3 position at 2016.0 as the reference. The UCAC4 motion looks real, but it isn't clear if it was measuring the central star or some other ejected material. The uncertainty as to whether or not to include the proper motion probably adds ~ 0.1" to the final positional uncertainty.
Category=Star
Description=[Eta Carinae stars]
Extended=YES

Template

TA Method	HFF Readout Mode	Slit	Subarray
NONE	false	S200A1	SUBS200A1

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
3	18	10.0	0.0	0.0	0.0	ROW_ORDER

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	3	NONE

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	Optional ETC ID
1	G140H/F070LP	S200A1	NRSRAPID	4	4	1	NONE	3	12	93.726	
2	G235H/F170LP	S200A1	NRSRAPID	3	4	2	NONE	3	12	75.03	
3	G395H/F290LP	S200A1	NRSRAPID	2	4	3	NONE	3	12	56.334	

Special Requirements	
	Aperture PA Range 223.84190369 to 260.84190369 Degrees (V3 85.0 to 122.0) No Parallel Attachments