



12602 - A $z = 0.0343$ Gold Rush: A Spectroscopic Infrared Study of SN 2026gzf

Cycle: 4, Proposal Category: DD

INVESTIGATORS

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OBSERVATIONS

<i>Folder</i>	<i>Observation</i>	<i>Label</i>	<i>Observing Template</i>	<i>Science Target</i>
Observation Folder				
	1	NIRSPEC	NIRSpec Fixed Slit Spectroscopy	(1) SN2026GZF
	2	MIRI/LRS	MIRI Low Resolution Spectroscopy	(1) SN2026GZF

ABSTRACT

EP 260321a is a recently discovered X-ray transient by the Einstein Probe. It was localized to a galaxy at $z = 0.0343$ and later showed features consistent with a broad-lined Type Ic supernova (SN Ic-BL), now identified as SN 2026gzf. The nature of the X-ray emission is not yet certain, though likely hypotheses include supernova shock break-out (SBO) or a low-luminosity gamma-ray burst (LLGRB). If SBO, EP 260321 would represent the first ever detection associated with a Ic-BL (and one of only a few SN of any type). If a LLGRB, SN 2026gzf would be one of the closest GRB-SNe ever observed, and even more so, EP 260321a would be one of the closest GRBs ever observed. It therefore offers a rare and valuable opportunity to study the unique SN Ic-BL subclass. There are several ongoing multi-wavelength campaigns dedicated to understanding this

source, and we request JWST observations to complete the multi-wavelength picture of this transient. Our proposed observations from 0.6 - 14 microns at ~ 50 days will also provide an essential comparison to SN 2024abup (a SN Ic-BL with no gamma-ray or X-ray counterpart). Our new data and direct comparison to SN 2024abup will allow us to search for predicted r-process emission (observable only in this micron range and at late times), test detailed modeling comparing SNe Ic-BL with/out high-energy counterparts, constrain explosion ejecta geometry through emission-line shape analysis, and explore the diversity of r-process nucleosynthesis in SNe Ic-BL. SN 2026gzf is unique, and we don't know why. Our observations will complement a multi-faceted characterization and will advance our understanding of massive star evolution and supernova physics.

OBSERVING DESCRIPTION

We will observe EP260321a/SN 2026gzf, a recently discovered X-ray transient associated with a Type Ic-BL supernova (d~140 Mpc), with low-resolution JWST NIRSpec/PRISM and MIRI/LRS spectroscopy. We will observe this supernova in one visit at a phase of ~50 days post-explosion for a total time of 6.9 hrs.

NIR + MIR spectroscopy will provide full IR coverage of essential diagnostic absorption and emission lines to test predicted modeling, probe possible molecule and dust formation, and search for signatures of r-process elements. The NIRSpec/PRISM and MIRI/LRS offer time-efficient observations of our target, and the low resolution is sufficient for our science goals due to the near-relativistic velocities of our target that make spectral features very broad.

Supernovae vary with time so we request non-interruptible observations between the MIRI and NIRSpec data. The target will be bright enough for direct target acquisition. Detailed observation settings were verified in the ETC ($S/N > 20$ in all lines) and based on similar successful previous JWST observations in the archive.

Proposal 12602 - Targets - A $z = 0.0343$ Gold Rush: A Spectroscopic Infrared Study of SN 2026qzf

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	SN2026GZF	RA: 09 59 42.8720 (149.9286333d)	Parallax: 0"	
		Dec: +00 25 6.38 (.41844d)	Epoch of Position: 2000		
		Equinox: J2000			
	<i>Comments:</i>				
	<i>Category=Star</i>				
	<i>Description=[Supernovae, X-ray transients]</i>				
	<i>Extended=NO</i>				

Proposal 12602 - Observation 1 - A z = 0.0343 Gold Rush: A Spectroscopic Infrared Study of SN 2026qzf

Wed Apr 29 23:00:09 GMT 2026

Observation	<p>Proposal 12602, Observation 1: NIRSPEC</p> <p>Diagnostic Status: Warning</p> <p>Observing Template: NIRSPEC Fixed Slit Spectroscopy</p>											
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			
	(1)	SN2026GZF	RA: 09 59 42.8720 (149.9286333d) Dec: +00 25 6.38 (.41844d) Equinox: J2000			Parallax: 0" Epoch of Position: 2000						
	<p><i>Comments:</i> <i>Category=Star</i> <i>Description=[Supernovae, X-ray transients]</i> <i>Extended=NO</i></p>											
Acquisition	#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	SAME	WATA	FULL	F140X	NRSRAPID	3	1	1	42.947	296761	
Template	HFF Readout Mode				Slit			Subarray				
	false				S200A1			FULL				
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	PRISM/CLEAR	S200A1	NRSIRS2RAPID	52	1	1	NONE	3	3	2319.634	296761

Proposal 12602 - Observation 1 - A $z = 0.0343$ Gold Rush: A Spectroscopic Infrared Study of SN 2026qzf

Special Requirements

Between Dates 01-MAY-2026:00:00:00 and 01-JUL-2026:00:00:00

Group Observations 1, 2, Non-interruptible

Proposal 12602 - Observation 2 - A z = 0.0343 Gold Rush: A Spectroscopic Infrared Study of SN 2026qzf

Wed Apr 29 23:00:09 GMT 2026

Observation	Proposal 12602, Observation 2: MIRI/LRS Diagnostic Status: Warning Observing Template: MIRI Low Resolution Spectroscopy									
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			
	(1)	SN2026GZF	RA: 09 59 42.8720 (149.9286333d) Dec: +00 25 6.38 (.41844d) Equinox: J2000	Parallax: 0" Epoch of Position: 2000						
	Comments: Category=Star Description=[Supernovae, X-ray transients] Extended=NO									
Acquisition	#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	Optional ETC ID	
	1	SAME	F560W	FASTGRPAVG8	8	1	1	177.603	296761	
Template	Subarray				Obtain Verification Image?					
	FULL				true					
Dithers	#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset				
	1	ALONG SLIT NOD								
Pointing Verification	#	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Integrations	PV Exposures/Dith	PV Total Dithers	PV Total Exposure Time	Optional ETC ID	Filter
	1	FASTR1	80	1	1	1	1	222.003		F560W

Proposal 12602 - Observation 2 - A $z = 0.0343$ Gold Rush: A Spectroscopic Infrared Study of SN 2026qzf

Spectral Elements	#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	Optional ETC ID
	Special Requirements	1	FASTR1	100	24	48	1	2	13447.844
Group Observations 1, 2, Non-interruptible									