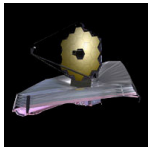

1740 - H-drop galaxies: ``Rosetta Stones'' at z~13 for galaxy formation studies

Cycle: 1, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
NIRSpec				
	1	HD1	NIRSpec Fixed Slit Spectroscopy	(1) HD1
	2	HD2	NIRSpec Fixed Slit Spectroscopy	(2) HD2
	3	HD3	NIRSpec Fixed Slit Spectroscopy	(3) HD3
	4	HD3	NIRSpec Fixed Slit Spectroscopy	(3) HD3

ABSTRACT

We propose NIRSpec/PRISM spectroscopy to confirm the Lyman break in secure candidates of luminous Lyman break galaxies at z~13. These galaxies were found in an H-band dropout selection to search for unprecedentedly high-z objects at z>12 in the 2.3 deg2 near-infrared deep imaging data in the COSMOS and UDS fields. After careful examination of non-detections in the deep optical to H-band images as well as the flat spectrum

from K-band to Spitzer IRAC [3.6] and [4.5]-bands, only three candidates remain. The absolute magnitudes of these objects are typically -23.4 and the photometric redshifts are estimated to be z>12. An ALMA program targeting one of the candidates shows a tentative [OIII]88um emission line at z=13.3. The line flux is at the lower edge of the expectation, implying that this galaxy is a very low-metal system before chemical enrichment begins. A successful detection of the Lyman break from at least one object among them will yield the new redshift record far from the current ones at z=9.1 and z=11.1, and demonstrate the JWST capability for confirming galaxies at z>12. These z~13 galaxies are luminous enough to be followed-up with higher spectral resolution modes and will be ``Rosetta Stones" for galaxy formation studies, once their redshifts are determined.

OBSERVING DESCRIPTION

This program will conduct NIRSpec spectroscopy for three z~13 galaxy candidates.

We will use PRISM to cover expected wavelengths of the Lyman breaks given photo-z accuracies, and the 0.4"-fixed slit to maximize signal-to-noise ratios and distinguish the Lyman alpha breaks at z~13 from low-z solutions in short integration times.

We will use Wide Aperture Target Acquisition (WATA) because our targets are as bright as K = 24.2-24.9 ABmag.

The Background Limited special requirement is used, as the achieved S/N changes by ~10% between low and high background.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	HD1	RA: 10 01 51.3100 (150.4637917d) Dec: +02 32 50.04 (2.54723d) Equinox: J2000		
Comments: *Category=Galaxy* *Description=[High-redshift galaxies]*				
(2)	HD2	RA: 02 18 52.4400 (34.7185000d) Dec: -05 08 36.11 (-5.14336d) Equinox: J2000		
Comments: *Category=Galaxy* *Description=[High-redshift galaxies]*				
(3)	HD3	RA: 02 16 54.4800 (34.2270000d) Dec: -05 09 37.05 (-5.16029d) Equinox: J2000		
Comments: *Category=Galaxy* *Description=[High-redshift galaxies]*				
(4)	STAR1-HD3	RA: 02 16 54.2858 (34.2261908d) Dec: -05 09 16.51 (-5.15459d) Equinox: J2000		
Comments: *Category=Star* *Description=[A stars]*				
(5)	STAR1-HD1	RA: 10 01 50.4200 (150.4600833d) Dec: +02 32 44.62 (2.54573d) Equinox: J2000		
Comments: *Category=Star* *Description=[A stars]*				

Observation

Proposal 1740, Observation 1: HD1

Wed Nov 02 18:00:56 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

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)	HD1	RA: 10 01 51.3100 (150.4637917d) Dec: +02 32 50.04 (2.54723d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[High-redshift galaxies]

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	5 STAR1-HD1	WATA	FULL	F140X	NRSRAPIDD6	3	1	1	171.788	62027

Template

Slit	Subarray
S400A1	SUBS400A1

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	2	SPATIAL

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	PRISM/CLEAR	S400A1	NRS	115	1	1	NONE	4	4	2873.034	

Special Requirements	Background Limited. Background no more than 40th percentile above minimum

Observation

Proposal 1740, Observation 2: HD2

Wed Nov 02 18:00:56 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit 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
(2)	HD2	RA: 02 18 52.4400 (34.7185000d) Dec: -05 08 36.11 (-5.14336d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[High-redshift galaxies]

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	WATA	FULL	CLEAR	NRSRAPIDD6	3	1	1	171.788	62027

Template

Slit	Subarray
S400A1	SUBS400A1

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	2	SPATIAL

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	PRISM/CLEAR	S400A1	NRS	72	1	1	NONE	4	4	1801.13	

Special Requirements	Background Limited. Background no more than 40th percentile above minimum

Observation

Proposal 1740, Observation 3: HD3

Wed Nov 02 18:00:56 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit 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
(3)	HD3	RA: 02 16 54.4800 (34.2270000d) Dec: -05 09 37.05 (-5.16029d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[High-redshift galaxies]

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	WATA	FULL	CLEAR	NRSRAPIDD6	3	1	1	171.788	62027

Template

Slit	Subarray
S400A1	SUBS400A1

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	2	SPATIAL

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	PRISM/CLEAR	S400A1	NRS	202	1	1	NONE	4	4	5041.77	

Special Requirements	Background Limited. Background no more than 40th percentile above minimum

Observation

Proposal 1740, Observation 4: HD3

Wed Nov 02 18:00:56 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec Fixed Slit Spectroscopy

Diagnostics

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(3)	HD3	RA: 02 16 54.4800 (34.2270000d) Dec: -05 09 37.05 (-5.16029d) Equinox: J2000		

Comments:
Category=Galaxy
Description=[High-redshift galaxies]

Acquisition

#	Target	TA Method	Subarray	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	4 STAR1-HD3	WATA	SUB32	CLEAR	NRSRAPID	3	1	1	0.08	62027

Template

Slit	Subarray
S400A1	SUBS400A1

Dithers

#	Primary Dither Positions	Sub-Pixel Pattern
1	2	SPATIAL

Spectral Elements

#	Grating/Filter	Slit	Readout Pattern	Groups/Int	Integrations/Exp	#	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	PRISM/CLEAR	S400A1	NRS	202	1	1	NONE	4	4	5041.77	

Special Requirements	
	Aperture PA Range 189 to 214 Degrees (V3 50.135849 to 75.135849) Background Limited. Background no more than 40th percentile above minimum