



1810 - The Stellar and Gas Content of Galaxies at Cosmic Noon

Cycle: 1, Proposal Category: GO

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	BlueJay-NORTH-Final	NIRSpec MultiObject Spectroscopy	(1) BLUEJAY-MASTER-NORTH
	2	BlueJay-SOUTH-Final	NIRSpec MultiObject Spectroscopy	(2) BLUEJAY-MASTER-SOUTH

ABSTRACT

The properties of galaxies in the local universe are substantially different from those measured at the peak of the cosmic star formation history, around $z \sim 2$. Key questions about this evolution are still open: what physical mechanism is responsible for quenching star formation in massive

galaxies? And what drives the observed evolution of the ionized gas emission? Using multi-object spectroscopy with NIRSpec, we aim to build a reference sample for the most important epoch of galaxy formation, by targeting about 150 galaxies with a uniform distribution in stellar mass ($9 < \log M/M_{\text{sun}} < 11.5$) and redshift ($1.7 < z < 3.5$). This program will transform our understanding of both the stellar populations and the ionized gas in high-redshift galaxies thanks to the broad wavelength range, low background, and low read-out noise offered by NIRSpec. Our representative sample will provide the first census of star formation histories and metal abundances for individual massive galaxies and, together with a suite of zoom-in simulations specifically designed to match these observations, will allow us to conclusively answer long-standing questions about the nature of galaxy quenching. We will additionally characterize the interstellar medium of high-redshift galaxies by measuring the complete suite of rest-frame optical emission lines, including many that are not accessible from the ground. By connecting the properties of the ionized gas to those of the stars measured in the same galaxy population, we will finally be able to build a consistent picture of how galaxies evolved over the last 10 Gyr.

OBSERVING DESCRIPTION

We plan to observe a sample of galaxies at $1.7 < z < 3.5$ with NIRSpec in the MOS mode. We will observe two pointings in the COSMOS field, using the following gratings and filters at each pointing: G140M/F100LP, G235M/F170LP, and G395M/F290LP. This will ensure a rest-frame coverage between 3700Å and 1.2μm for every galaxy in the sample. We adopt a 2-shutter nodding which in most cases will be used as a dither, since most of the targets are large enough to contaminate adjacent shutters. Background subtraction will be performed using a master sky spectrum derived from empty shutters. NIRCам parallel imaging will also be obtained, adopting a 2-point compromise dither.

Proposal 1810 - Targets - The Stellar and Gas Content of Galaxies at Cosmic Noon

Fixed Targets	#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
	(1)	BLUEJAY-MASTER-NORTH	RA: 10 00 27.5767 (150.1149029d) Dec: +02 22 53.42 (2.38151d) Equinox: J2000		
		<i>Comments:</i> Description=[]			
(2)	BLUEJAY-MASTER-SOUTH	RA: 10 00 25.6356 (150.1068150d) Dec: +02 17 2.56 (2.28404d) Equinox: J2000			
		<i>Comments:</i> Description=[]			

Proposal 1810 - Observation 1 - The Stellar and Gas Content of Galaxies at Cosmic Noon

Mon Oct 17 16:01:07 GMT 2022

Observation	Proposal 1810, Observation 1: BlueJay-NORTH-Final Diagnostic Status: Warning Observing Template: NIRSpec MultiObject Spectroscopy Coordinated Parallel Template(s): NIRCcam Imaging																																																												
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Proposal 1810 - Observation 1 - The Stellar and Gas Content of Galaxies at Cosmic Noon

Spectral Elements	NIRSpec MultiObject Spectroscopy	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
	1	1 (G140M/F100LP)	c1	2 Shutter Slitlet	150.114614875 Degrees 2.378154444444 447 Degrees	69.617151048086 21			4	16	23575.646
	2	2 (G140M/F100LP)	c1	2 Shutter Slitlet	150.114614875 Degrees 2.378154444444 447 Degrees	69.617151048086 21			4	16	23575.646
	3	3 (G235M/F170LP)	c1	2 Shutter Slitlet	150.114614875 Degrees 2.378154444444 447 Degrees	69.617151048086 21			4	8	11787.823
	4	4 (G395M/F290LP)	c1	2 Shutter Slitlet	150.114614875 Degrees 2.378154444444 447 Degrees	69.617151048086 21			4	4	5893.912
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	F200W	F444W	DEEP8	7	4	16	4	22117.746		
	2	F150W	F356W	DEEP8	7	4	16	4	22117.746		
	3	F115W	F277W	DEEP8	7	2	8	4	11037.4		
	4	F090W	F277W	DEEP8	7	1	4	4	5497.226		
Special Requirements	No Parallel MSA Scheduled Aperture PA 69.6171697 to 69.6171697 Degrees (V3 291.0426 to 291.0426)										

Proposal 1810 - Observation 2 - The Stellar and Gas Content of Galaxies at Cosmic Noon

Mon Oct 17 16:01:07 GMT 2022

Observation	Proposal 1810, Observation 2: BlueJay-SOUTH-Final Diagnostic Status: Warning Observing Template: NIRSpec MultiObject Spectroscopy Coordinated Parallel Template(s): NIRCcam Imaging										
	(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)	BLUEJAY-MASTER-SOUTH	RA: 10 00 25.6356 (150.1068150d) Dec: +02 17 2.56 (2.28404d) Equinox: J2000								
<i>Comments: Description=[]</i>											
Acquisition	NIRSpec MultiObject Spectroscopy	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
	1	Filter: F110W; Readout: NRSRAPIDD6; 8 sources in 4 quads; [Optimal TA Accuracy]	SAME	F110W	Auto Acq MSA Config	NRSRAPIDD6	3	1	4	687.153	
Template	NIRSpec MultiObject Spectroscopy					NIRCcam Imaging					
	TA Method: MSATA Obtain Confirmation Images: No Science Aperture: MSA Center Primary Candidate List: BlueJay-Parent-South (1366 sources) Filler Candidate List: null Spectral Overlap Map: jwst-nirspec-mr Spectral Overlap Threshold: 1.5					Module: ALL Subarray: FULL					
Reference Stars	Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude	
	1	7595	150.090620	2.256560	22.96461511762092 3	1	10730	150.084255	2.289811	22.81511622988310 3	
	1	7748	150.091392	2.259068	21.68483409190262 3	1	11369	150.109662	2.295685	22.70295922376540 8	
	1	8481	150.085048	2.266171	22.56667149382883 5	1	12145	150.091093	2.302832	23.16559726911002	
	1	9788	150.125810	2.279917	22.94712955508123 3	1	12655	150.102583	2.308164	22.07862185502426	
Dithers	#	Dither Type									
	1	2-POINT-WITH-NIRCcam-SIZE1									

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Spectral Elements	NIRSpec MultiObject Spectroscopy	Exposure Specification	MSA Configuration	Nod Pattern	Pointing	Aperture PA	Dispersion Offset (Shutters)	Cross-Dispersion Offset (Shutters)	Total Dithers	Total Integrations	Total Exposure Time
	1	1 (G140M/F100LP)	c1	2 Shutter Slitlet	150.10362233333 333 Degrees 2.2814969444444 44 Degrees	74.702574814243 1			4	16	23575.646
	2	2 (G140M/F100LP)	c1	2 Shutter Slitlet	150.10362233333 333 Degrees 2.2814969444444 44 Degrees	74.702574814243 1			4	16	23575.646
	3	3 (G235M/F170LP)	c1	2 Shutter Slitlet	150.10362233333 333 Degrees 2.2814969444444 44 Degrees	74.702574814243 1			4	8	11787.823
	4	4 (G395M/F290LP)	c1	2 Shutter Slitlet	150.10362233333 333 Degrees 2.2814969444444 44 Degrees	74.702574814243 1			4	4	5893.912
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	F200W	F444W	DEEP8	7	4	16	4	22117.746		
	2	F150W	F356W	DEEP8	7	4	16	4	22117.746		
	3	F115W	F277W	DEEP8	7	2	8	4	11037.4		
	4	F090W	F277W	DEEP8	7	1	4	4	5497.226		
Special Requirements	No Parallel MSA Scheduled Aperture PA 74.7027097 to 74.7027097 Degrees (V3 296.12814 to 296.12814)										