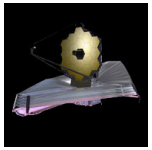

1869 - LyC22 - Deep spectroscopic insights on star-forming galaxies 2.2 Gyr after the Big Bang

Cycle: 1, Proposal Category: GO

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	Wp_A_v8_new	NIRSpec MultiObject Spectroscopy	(12) msa_table_v4_header_cleaned
	2	P140_off	NIRSpec MultiObject Spectroscopy	(7) LyC22_APTcat_all_v3
	3	SSA22_2nd_v1	NIRSpec MultiObject Spectroscopy	(10) LyC22-SSA22visit2_APTcat_v4
	4	WpPA0_pre_imag	NIRCam Imaging	(5) JWSTLYC-WPAPTCAT-COPY
	5	SSA22PA25_pre_imag	NIRCam Imaging	(3) JWSTLYC-SSA22APTCAT-COPY
	6	SSA22PA10_pre_imag	NIRCam Imaging	(4) JWSTLYC-SSA22APTCAT-COPY-1
	12	NEW_visit12_v9	NIRSpec MultiObject Spectroscopy	(8) LyC22_APTcat_all_v7_VISIT_12

ABSTRACT

We propose the LyC22 survey, a reference survey at z~3, to provide deep rest-optical spectra of Lyman continuum (LyC) emitting galaxies and comparison samples at 2.2 Gyr after the Big Bang.

The proposed NIRSpec observations will provide a full spectral coverage over ~2800-6800 Ang rest-frame, including the major indicators of LyC escape, which have recently been established from studies at low-z. The full suite of faint optical emission lines will be used to test the indirect LyC indicators, determine ISM properties (density, temperature, abundances), and constrain the ionizing radiation field of LyC emitters, LyC non-emitters, and other star-forming galaxies at z~3. The observations will also allow us to examine a possible redshift evolution of these properties.

Such a reference survey is uniquely possible at z~3, where the largest number of LyC emitters beyond z~0.4 is currently known. It is also the closest one can get to the epoch of reionization and obtain precision measurements of the LyC, the far-UV stellar and interstellar - already secured - and nebular spectra of the same galaxies with JWST. Such data are essential to obtain a consistent picture of stellar populations, the UV radiation field,

abundances, and ISM properties of galaxies. Most importantly, understanding indirect LyC indicators at high-z is crucial since direct LyC detections are fundamentally not possible in the epoch of reionization.

The LyC22 survey targets two fields selected from major high-z Lyman continuum surveys undertaken with Keck, Subaru and HST. It will obtain more than 200 deep spectra of z~3 star-forming galaxies, including 29 with known LyC emission or firm upper limits.

OBSERVING DESCRIPTION

We request JWST/NIRSpec observations of a large sample of z~3 star-forming galaxies targeting more than 200 sources in total, including 29 LyC emitters and non-emitters, in the SSA22 and Westphal fields with 3 MSA pointings (1 in Westphal and 2 in SSA22). Observations will be done in MSA mode with gratings/filters G140M/F100LP and G235M/F170LP, providing a full spectral coverage from 0.97um to 3.17um with a power resolution R~1000, to detect emission lines of H, He, O, N, Mg, S, and others, in the range between Mg II 2800A and [SII]6731A.

For each source we assign a 3-shutter slitlet. The 3 MSA pointings have sufficient reference stars in the NIRSpec field of view for the MSA Target Acquisition (MSATA). The observing strategy for the MSA currently consists of 12 integrations per setup and pointing (i.e., 9.6h exposure x grating x pointing) with 32 Groups each with the NRSIRS2RAPID readout mode. A dither pattern 3-Shutter Nod will be used (0.5" in the spatial direction).

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	JWSTLYC-WPAPTCAT	RA: 14 18 7.7257 (214.5321904d) Dec: +52 29 17.67 (52.48824d) Equinox: J2000		
Comments: *Description=[]*				
(2)	JWSTLYC-SSA22APTCAT	RA: 22 17 4.0716 (334.2669650d) Dec: +00 19 49.48 (.33041d) Equinox: J2000		
Comments: *Description=[]*				
(3)	JWSTLYC-SSA22APTCAT-COPY	RA: 22 16 51.7646 (334.2156858d) Dec: +00 19 50.67 (.33074d) Equinox: J2000		
Comments: *Description=[]*				
(4)	JWSTLYC-SSA22APTCAT-COPY-1	RA: 22 17 13.1396 (334.3047483d) Dec: +00 18 57.05 (.31585d) Equinox: J2000		
Comments: *Description=[]*				
(5)	JWSTLYC-WPAPTCAT-COPY	RA: 14 18 12.4763 (214.5519846d) Dec: +52 28 57.81 (52.48273d) Equinox: J2000		
Comments: *Description=[]*				
(7)	LyC22_APTcat_all_v3	RA: 22 16 52.5358 (334.2188992d) Dec: +00 19 38.21 (.32728d) Equinox: J2000		
Comments: *Description=[]*				
(8)	LyC22_APTcat_all_v7_VISIT_12	RA: 22 16 52.5358 (334.2188992d) Dec: +00 19 38.29 (.32730d) Equinox: J2000		
Comments: *Description=[]*				
(10)	LyC22-SSA22visit2_APTcat_v4	RA: 22 17 13.2967 (334.3054029d) Dec: +00 18 42.57 (.31182d) Equinox: J2000		
Comments: *Description=[]*				
(12)	msa_table_v4_header_cleaned	RA: 14 18 12.1574 (214.5506558d) Dec: +52 29 19.83 (52.48884d) Equinox: J2000		
Comments: *Description=[]*				

Observation

Proposal 1869, Observation 1: Wp_A_v8_new Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec MultiObject Spectroscopy

Diagnostics

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

(Visit 1:1) Warning (Form): The recommended value is 8 Reference Stars for this template.

(Visit 1:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(12)	msa_table_v4_header_cleaned	RA: 14 18 12.1574 (214.5506558d) Dec: +52 29 19.83 (52.48884d) Equinox: J2000		

Comments:
Description=[]

Acquisition

#	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: NRSRAPID; 6 sources in 4 quads; [Reduced Accuracy]	SAME	F110W	Auto Acq MSA Config	NRSRAPID	3	1	4	171.788	

Template

TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold
MSATA	No	MSA Center	msa_table_v4_header_cleaned (402 sources)		jwst-nirspec-mr	1.5

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	700002	214.582010	52.454028	20.95999908	1	700012	214.539949	52.488756	21.81999969
1	700003	214.577606	52.455872	20.80999946	1	700025	214.562801	52.445869	20.94000053
1	700011	214.593964	52.487363	21.29000091	1	700046	214.619217	52.475670	21.39999961

Spectral Elements

#	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	3 Shutter Slitlet	214.58130245833334 Degrees 52.480207777777 78 Degrees	71.458507257363 44			3	9	16543.801
2	1 (G140M/F100LP)	c1	3 Shutter Slitlet	214.58130245833334 Degrees 52.480207777777 78 Degrees	71.458507257363 44			3	9	16543.801
3	2 (G235M/F170LP)	c1	3 Shutter Slitlet	214.58130245833334 Degrees 52.480207777777 78 Degrees	71.458507257363 44			3	9	15887.301
4	2 (G235M/F170LP)	c1	3 Shutter Slitlet	214.58130245833334 Degrees 52.480207777777 78 Degrees	71.458507257363 44			3	9	15887.301

Special Requirements

MSA Scheduled Aperture PA 71.4342 to 71.4342 Degrees (V3 292.85968 to 292.85968)

1 After 4 by 60 Days to <None specified>

Observation

Proposal 1869, Observation 2: P140_off

Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec MultiObject Spectroscopy

Diagnostics

(P140_off (Obs 2)) Warning (Form): Config c1 (#1) has 1 filler slits affected by failed closed shutters.

(P140_off (Obs 2)) Warning (Form): Config c1 (#2) has 1 filler slits affected by failed closed shutters.

(P140_off (Obs 2)) Warning (Form): Config c1 (#3) has 1 filler slits affected by failed closed shutters.

(P140_off (Obs 2)) Warning (Form): Config c1 (#4) has 1 filler slits affected by failed closed shutters.

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(7)	LyC22_APTcat_all_v3	RA: 22 16 52.5358 (334.2188992d) Dec: +00 19 38.21 (.32728d) Equinox: J2000		

Comments:
Description=[]

Acquisition

#	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	Filter: F140X; Readout: NRSRAPIDD6; 8 sources in 3 quads; [Optimal TA Accuracy]	SAME	F140X	Auto Acq MSA Config	NRSRAPIDD6	3	1	4	687.153	

Template

TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold
MSATA	No	MSA Center	primer (54 sources)	filler (556 sources)	jwst-nirspec-mr	1.5

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	5008	334.232430	0.354004	23.789375285559004	1	5040	334.203993	0.328398	22.790686593317943
1	5014	334.246891	0.327303	22.734661308106453	1	5058	334.219570	0.363629	23.390634314065725
1	5033	334.194019	0.329850	22.543754433803414	1	5060	334.227754	0.338737	23.081123819469283
1	5035	334.202773	0.312902	23.818180992898547	1	5061	334.206294	0.351782	23.072909314250754

Spectral Elements

#	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	3 Shutter Slitlet	334.21841575 Degrees 0.33337916666666667 Degrees	22.50340862026789			3	9	16543.801
2	1 (G140M/F100LP)	c1	3 Shutter Slitlet	334.21841575 Degrees 0.33337916666666667 Degrees	22.50340862026789			3	9	16543.801
3	2 (G235M/F170LP)	c1	3 Shutter Slitlet	334.21841575 Degrees 0.33337916666666667 Degrees	22.50340862026789			3	9	15887.301
4	2 (G235M/F170LP)	c1	3 Shutter Slitlet	334.21841575 Degrees 0.33337916666666667 Degrees	22.50340862026789			3	9	15887.301

Special Requirements

MSA Scheduled Aperture PA 22.5034 to 22.5034 Degrees (V3 243.92883 to 243.92883)

2 After 5 by 60 Days to <None specified>

Observation

Proposal 1869, Observation 3: SSA22_2nd_v1 Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec MultiObject 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
(10)	LyC22-SSA22visit2_APTcat_v4	RA: 22 17 13.2967 (334.3054029d) Dec: +00 18 42.57 (.31182d) Equinox: J2000		

Comments:
Description=[]

Acquisition

#	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	Filter: CLEAR; Readout: NRSRAPID; 8 sources in 2 quads; [Reduced Accuracy]	SAME	CLEAR	Auto Acq MSA Config	NRSRAPID	3	1	4	171.788	

Template

TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold
MSATA	No	MSA Center	PR_v4 (103 sources)	FL_v4 (422 sources)	jwst-nirspec-mr	1.5

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	50009	334.287859	0.334541	21.4656995590433	1	50031	334.289211	0.350134	22.481322692774427
1	50022	334.291595	0.340774	21.99676253986071	1	50048	334.305033	0.289179	22.94597749681126
1	50023	334.296114	0.303907	22.144453740956287	1	50050	334.308043	0.285745	23.058681248318052
1	50030	334.285345	0.352393	22.46520401193485	1	50051	334.289153	0.349562	22.83567308242222

Spectral Elements

#	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	3 Shutter Slitlet	334.29522458333 4 Degrees 0.32050944444444 444 Degrees	210.87512090843 705			3	9	16543.801
2	1 (G140M/F100LP)	c1	3 Shutter Slitlet	334.29522458333 4 Degrees 0.32050944444444 444 Degrees	210.87512090843 705			3	9	16543.801
3	2 (G235M/F170LP)	c1	3 Shutter Slitlet	334.29522458333 4 Degrees 0.32050944444444 444 Degrees	210.87512090843 705			3	9	15887.301
4	2 (G235M/F170LP)	c1	3 Shutter Slitlet	334.29522458333 4 Degrees 0.32050944444444 444 Degrees	210.87512090843 705			3	9	15887.301

Special Requirements

MSA Scheduled Aperture PA 210.8752 to 210.8752 Degrees (V3 72.30059 to 72.30059)

3 After 6 by 60 Days to <None specified>

Observation

Proposal 1869, Observation 4: WpPA0_pre_imag

Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 4:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 4:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 4:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 4:4) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(5)	JWSTLYC-WPAPTCAT-COPY	RA: 14 18 12.4763 (214.5519846d) Dec: +52 28 57.81 (52.48273d) Equinox: J2000		

Comments:
Description=[]

Template

Module	Subarray	Target Placement
ALL	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	FULLBOX	8NIRSPEC	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	F150W	F277W	BRIGHT1	5	1	8	8	773.047	

Special Requirements

Sequence Visits within 53.0 Days
Visits Same PA

1 After 4 by 60 Days to <None specified>

Observation

Proposal 1869, Observation 5: SSA22PA25_pre_imag

Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 5:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 5:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 5:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 5:4) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(3)	JWSTLYC-SSA22APTCAT-COPY	RA: 22 16 51.7646 (334.2156858d) Dec: +00 19 50.67 (.33074d) Equinox: J2000		

Comments:
Description=[]

Template

Module	Subarray	Target Placement
ALL	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	FULLBOX	8NIRSPEC	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	F150W	F277W	BRIGHT1	5	1	8	8	773.047	

Special Requirements

Sequence Visits within 53.0 Days
Visits Same PA

2 After 5 by 60 Days to <None specified>

Observation

Proposal 1869, Observation 6: SSA22PA10_pre_imag

Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 6:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 6:3) Warning (Form): Overheads are provisional until the Visit Planner has been run.
(Visit 6:4) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	JWSTLYC-SSA22APTCAT-COPY-1	RA: 22 17 13.1396 (334.3047483d) Dec: +00 18 57.05 (.31585d) Equinox: J2000		

Comments:
Description=[]

Template

Module	Subarray	Target Placement
ALL	FULL	Module Gap

Dithers

#	Primary Dither Type	Primary Dithers	Subpixel Dither Type	Dither Size	Subpixel Positions
1	FULLBOX	8NIRSPEC	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	F150W	F277W	BRIGHT1	5	1	8	8	773.047	

Special Requirements

Sequence Visits within 53.0 Days
Visits Same PA

3 After 6 by 60 Days to <None specified>

Observation

Proposal 1869, Observation 12: NEW_visit12_v9 Tue Nov 21 17:00:58 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec MultiObject Spectroscopy

Diagnostics

(Visit 12:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(8)	LyC22_APTcat_all_v7_VISIT_12	RA: 22 16 52.5358 (334.2188992d) Dec: +00 19 38.29 (.32730d) Equinox: J2000		

Comments:
Description=[]

Acquisition

#	Reference Star Bin	Target	Filter	MSA Configuration	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	Filter: CLEAR; Readout: NRSRAPID; 8 sources in 4 quads; [Reduced Accuracy]	SAME	CLEAR	Auto Acq MSA Config	NRSRAPID	3	1	4	171.788	

Template

TA Method	Obtain Confirmation Images	Science Aperture	Primary Candidate List	Filler Candidate List	Spectral Overlap Map	Spectral Overlap Threshold
MSATA	No	MSA Center	Primer_v7 (82 sources)	Filler_v7 (580 sources)	jwst-nirspec-mr	1.5

Reference Stars

Visit	ID	RA	Dec	Magnitude	Visit	ID	RA	Dec	Magnitude
1	5007	334.202095	0.342049	22.8167360734941	1	5033	334.194019	0.329850	22.543754433803414
1	5014	334.246891	0.327303	22.734661308106453	1	5046	334.230541	0.293358	23.598593302787833
1	5020	334.211886	0.334252	21.787715815250422	1	5053	334.218750	0.301347	23.038343127476367
1	5027	334.244747	0.333131	22.08022681144191	1	5061	334.206294	0.351782	23.072909314250754

Spectral Elements

#	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	3 Shutter Slitlet	334.2189434166666 Degrees 0.3222297222222222 Degrees	210.85421025234615			3	9	16543.801
2	1 (G140M/F100LP)	c1	3 Shutter Slitlet	334.2189434166666 Degrees 0.3222297222222222 Degrees	210.85421025234615			3	9	16543.801
3	2 (G235M/F170LP)	c1	3 Shutter Slitlet	334.2189434166666 Degrees 0.3222297222222222 Degrees	210.85421025234615			3	9	15887.301
4	2 (G235M/F170LP)	c1	3 Shutter Slitlet	334.2189434166666 Degrees 0.3222297222222222 Degrees	210.85421025234615			3	9	15887.301

Special Requirements

MSA Scheduled Aperture PA 210.8542 to 210.8542 Degrees (V3 72.27962 to 72.27962)