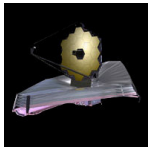

4912 - Mapping the multi-phase outflows in z~6 luminous quasars

Cycle: 3, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	2	J1148	NIRSpec IFU Spectroscopy	(1) J1148+5251
	7	J1148	NIRSpec IFU Spectroscopy	(1) J1148+5251
	5	PSOJ183	NIRSpec IFU Spectroscopy	(4) P183+05
	3	J1319	NIRSpec IFU Spectroscopy	(2) J1319+0950
	4	J2310	NIRSpec IFU Spectroscopy	(3) J2310+1855

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	6	J2054	NIRSpec IFU Spectroscopy	(5) J2054-0005

ABSTRACT

Old, passive, and massive galaxies observed at z~4-5 must have undergone through quenching at z~6. Massive galactic outflows were considered to be the most efficient mechanism for rapid quenching in the early Universe. However, current observations of molecular and neutral atomic gas at z~6 have suggested that they may not be powerful enough to sweep gas out of massive galaxies. Since recent works have highlighted that ionized gas may account for a significant part of the total outflowing gas in such massive high-z galaxies, we propose JWST/NIRSpec observations to map the warm ionized gas in five z~6 quasars showing evidence of massive cool (molecular/neutral) outflows, which all have a mass loading factor less than or of the order of one when only the cool gas phase is considered. By mapping the broad components of the optical nebular lines (e.g. [OIII]5007, Halpha) with NIRSpec IFU observations, we will be able to reveal ionized outflowing gas on kpc scales and estimate its key physical properties such as size, velocity, and mass. The properties of the ionized gas combined with those of the cool phase will establish how efficient galactic outflows are in regulating star formation in the early Universe. We will also investigate if the gas kinematics and morphology are affected by outflows or not.

OBSERVING DESCRIPTION

The goal of this program is to detect the ionized outflowing gas in five z~6 quasars by mapping the broad component of the [OIII] line at 5007 A and Balmer lines such as Halpha. We have selected five galaxies with clear evidence of massive outflow to maximize our chance to detect the ionized gas in outflow.

We will obtain NIRSpec IFU observations with the configuration G395H/F290LP which covers the wavelength range between 2.87 um and 5.28 um.

We will not perform Target Acquisition, since the absolute JWST pointing accuracy of 0.1arcsec is more than sufficient given the size of our targets. The allowed PA range is defined to avoid bright source.

The exposure time is based on the ETC version 3.0.

We will use NRSIRS2 readout pattern mode to reduce the data volume. For all source we will use the same configuration

No target acquisition

6-point dither pattern (medium)

25 groups, 1 integrations per dither position

Readout mode: NRSIRS2

Total exposure time on source: 11029 sec

27 January 2025

Included constraints on the position angle (PA) of J1148+5251 to minimize contamination from a bright galaxy in the field.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	J1148+5251	RA: 11 48 16.6400 (177.0693333d) Dec: +52 51 50.30 (52.86397d) Equinox: J2000		
Comments: Quasar at z = 6.4189 *Category=Galaxy* *Description=[Active galactic nuclei, High-redshift galaxies, Quasars]* *Extended=YES*				
(2)	J1319+0950	RA: 13 19 11.2950 (199.7970625d) Dec: +09 50 51.40 (9.84761d) Equinox: J2000		
Comments: Quasar at z = 6.1321 *Category=Galaxy* *Description=[Active galactic nuclei, Quasars]* *Extended=YES*				
(3)	J2310+1855	RA: 23 10 38.8999 (347.6620829d) Dec: +18 55 19.67 (18.92213d) Equinox: J2000		
Comments: Quasar at z = 6.0025 *Category=Galaxy* *Description=[Active galactic nuclei, Quasars]* *Extended=YES*				
(4)	P183+05	RA: 12 12 26.9810 (183.1124208d) Dec: +05 05 33.49 (5.09264d) Equinox: J2000		
Comments: Quasars at z =6.4386 *Category=Galaxy* *Description=[Active galactic nuclei, Quasars]* *Extended=YES*				
(5)	J2054-0005	RA: 20 54 6.5030 (313.5270958d) Dec: -00 05 14.43 (-.08734d) Equinox: J2000		
Comments: Quasars at z = 6.0391 *Category=Galaxy* *Description=[Active galactic nuclei, Quasars]* *Extended=YES*				

Observation

Proposal 4912, Observation 2: J1148

Fri Mar 14 20:00:16 GMT 2025

Diagnostic Status: Warning

Observing Template: NIRSpec IFU 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)	J1148+5251	RA: 11 48 16.6400 (177.0693333d) Dec: +52 51 50.30 (52.86397d) Equinox: J2000		

Comments: Quasar at z = 6.4189
Category=Galaxy
Description=[Active galactic nuclei, High-redshift galaxies, Quasars]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	6	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSIRS2	25	1	false	true	NONE	6	6	11029.201	177454

Special Requirements

Aperture PA Range 47.97164917 to 220.97164917 Degrees (V3 269.0 to 82.0)
Aperture PA Range 295.97164917 to 331.97164917 Degrees (V3 157.0 to 193.0)

Observation

Proposal 4912, Observation 7: J1148

Fri Mar 14 20:00:16 GMT 2025

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	J1148+5251	RA: 11 48 16.6400 (177.0693333d) Dec: +52 51 50.30 (52.86397d) Equinox: J2000		

Comments: Quasar at z = 6.4189
Category=Galaxy
Description=[Active galactic nuclei, High-redshift galaxies, Quasars]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	6	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSIRS2	25	1	false	true	NONE	6	6	11029.201	177454

Special Requirements

Aperture PA Range 47.97164917 to 220.97164917 Degrees (V3 269.0 to 82.0)
Aperture PA Range 295.97164917 to 331.97164917 Degrees (V3 157.0 to 193.0)

Observation

Proposal 4912, Observation 5: PSOJ183

Fri Mar 14 20:00:16 GMT 2025

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	P183+05	RA: 12 12 26.9810 (183.1124208d) Dec: +05 05 33.49 (5.09264d) Equinox: J2000		

Comments: Quasars at z =6.4386
Category=Galaxy
Description=[Active galactic nuclei, Quasars]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	6	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSIRS2	25	1	false	true	NONE	6	6	11029.201	177454

Special Requirements

Aperture PA Range 8.97164917 to 138.97164917 Degrees (V3 230.0 to 360.0)
Aperture PA Range 139.97164917 to 248.97164917 Degrees (V3 1.0 to 110.0)
Aperture PA Range 283.97164917 to 344.97164917 Degrees (V3 145.0 to 206.0)

Observation

Proposal 4912, Observation 3: J1319

Fri Mar 14 20:00:16 GMT 2025

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
(2)	J1319+0950	RA: 13 19 11.2950 (199.7970625d) Dec: +09 50 51.40 (9.84761d) Equinox: J2000		

Comments: Quasar at z = 6.1321
Category=Galaxy
Description=[Active galactic nuclei, Quasars]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	6	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSIRS2	25	1	false	true	NONE	6	6	11029.201	177454

Observation

Proposal 4912, Observation 4: J2310

Fri Mar 14 20:00:17 GMT 2025

Diagnostic Status: Warning

Observing Template: NIRSpec IFU 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)	J2310+1855	RA: 23 10 38.8999 (347.6620829d) Dec: +18 55 19.67 (18.92213d) Equinox: J2000		

Comments: Quasar at z = 6.0025
Category=Galaxy
Description=[Active galactic nuclei, Quasars]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	6	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSIRS2	25	1	false	true	NONE	6	6	11029.201	177454

Special Requirements

Aperture PA Range 206.97164917 to 224.97164917 Degrees (V3 68.0 to 86.0)
Aperture PA Range 308.97164917 to 123.97164917 Degrees (V3 170.0 to 345.0)

Observation

Proposal 4912, Observation 6: J2054

Fri Mar 14 20:00:17 GMT 2025

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(5)	J2054-0005	RA: 20 54 6.5030 (313.5270958d) Dec: -00 05 14.43 (-.08734d) Equinox: J2000		

Comments: Quasars at z = 6.0391
Category=Galaxy
Description=[Active galactic nuclei, Quasars]
Extended=YES

Template

TA Method	HFF Readout Mode
NONE	false

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	6	

Spectral Elements

#	Grating/Filter	Readout Pattern	Groups/Int	Integrations/Exp	Leakcal	Dither	Autocal	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	G395H/F290LP	NRSIRS2	25	1	false	true	NONE	6	6	11029.201	177454