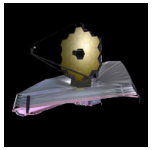

2457 - Extreme quasar feedback at the peak of the galaxy formation epoch.

Cycle: 1, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1		NIRSpec IFU Spectroscopy	(1) SDSS-J221524.00-005643.8
	2		NIRSpec IFU Spectroscopy	(2) SDSS-J083200.20+161500.3
	52		NIRSpec IFU Spectroscopy	(2) SDSS-J083200.20+161500.3
	3		NIRSpec IFU Spectroscopy	(3) SDSS-J083448.48+015921.1
	4		NIRSpec IFU Spectroscopy	(4) SDSS-J123241.73+091209.3
	54		NIRSpec IFU Spectroscopy	(4) SDSS-J123241.73+091209.3
	5		NIRSpec IFU Spectroscopy	(5) SDSS-J121704.70+023417.1

ABSTRACT

Feedback from accreting supermassive black holes is now a standard ingredient in galaxy formation models. It may be necessary for recreating the steep high-mass end of the stellar mass function and for establishing the black-hole/bulge correlations. Powerful ionized gas winds are a ubiquitous feature in luminous obscured z = 0.5 quasars. We now propose to explore quasar outflows at the peak epoch of galaxy formation and quasar activity, when quasar winds must have made the strongest impact on galaxy formation. We request NIRSpec integral field spectroscopy observations of 5

near-Eddington red quasars at z~2.5 with extreme (>> 1000 km/s) outflow activity, well beyond that seen at low redshifts. We will observe Hbeta+[OIII] and Ha+[NII]+[SII] in a single configuration per target at an 0.8 kpc resolution. We will measure the energetics of the outflows to gauge their driving mechanism and whether they have the necessary coupling efficiency in establishing the local correlation between the mass of the black-hole/bulge. We will perform resolved ionization diagnostics to isolate regions within each host galaxy photoionized by the quasar, shocks from the outflows, and recent star formation. We will map the location of powerful outflows and compare them to recent star formation locations to see if regions of powerful outflows coincide with low star formation regions. With their unprecedented [OIII] kinematics, red quasars may be the signposts of the extreme "blow-out" phase of quasar feedback that is expected to affect star formation significantly. NIRSpec-IFU observations will allow us to test this hypothesis definitively.

OBSERVING DESCRIPTION

We will be observing five high redshift quasars using the NIRSpec IFU. The main goal is to spatially resolve multiple nebular emission lines (e.g., H-beta, [OIII], H-alpha) redshifted into the near-infrared.

The following are the observing mode per object:

NIRSpec IFU with G235H/F170LP. 10-point small cycling dither pattern. Readout mode of NRSIRS2RAPID with 50 groups and 1 integration per dither position. WATA target acquisition using the quasars with NRSRAPIDD6 readout mode with 3 groups for a total acquisition time of 14.452 seconds in the F110W filter. Total science exposure per target: 7440.334 seconds.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	SDSS-J221524.00-005643.8	RA: 22 15 24.0134 (333.8500558d) Dec: -00 56 43.68 (-.94547d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Quasars]* *Extended=YES*				
(2)	SDSS-J083200.20+161500.3	RA: 08 32 0.2029 (128.0008454d) Dec: +16 15 0.38 (16.25011d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Quasars]* *Extended=YES*				
(3)	SDSS-J083448.48+015921.1	RA: 08 34 48.4830 (128.7020125d) Dec: +01 59 21.17 (1.98921d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Quasars]* *Extended=YES*				
(4)	SDSS-J123241.73+091209.3	RA: 12 32 41.7378 (188.1739075d) Dec: +09 12 9.38 (9.20261d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Quasars]* *Extended=YES*				
(5)	SDSS-J121704.70+023417.1	RA: 12 17 4.7030 (184.2695958d) Dec: +02 34 17.15 (2.57143d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Quasars]* *Extended=YES*				

Observation

Proposal 2457, Observation 1

Wed Jul 05 20:00:50 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU 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)	SDSS-J221524.00-005643.8	RA: 22 15 24.0134 (333.8500558d) Dec: -00 56 43.68 (-.94547d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	11	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	11	11	8184.367	

Special Requirements

Aperture PA Range 86 to 175 Degrees (V3 307.02746582 to 36.02746582)
Aperture PA Range 205 to 242 Degrees (V3 66.02746582 to 103.02746582)
Aperture PA Range 249 to 257 Degrees (V3 110.02746582 to 118.02746582)
Aperture PA Range 336 to 352 Degrees (V3 197.02746582 to 213.02746582)

Observation

Proposal 2457, Observation 2

Wed Jul 05 20:00:50 GMT 2023

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
(2)	SDSS-J083200.20+161500.3	RA: 08 32 0.2029 (128.0008454d) Dec: +16 15 0.38 (16.25011d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	11	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	11	11	8184.367	

Special Requirements

Aperture PA Range 43 to 70 Degrees (V3 264.02746582 to 291.02746582)
Aperture PA Range 189 to 195 Degrees (V3 50.02746582 to 56.02746582)
Aperture PA Range 297 to 305 Degrees (V3 158.02746582 to 166.02746582)

Observation

Proposal 2457, Observation 52 Wed Jul 05 20:00:50 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Comments: WOPR copy of obs. 2 that failed

Diagnostics

(Visit 52:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	SDSS-J083200.20+161500.3	RA: 08 32 0.2029 (128.0008454d) Dec: +16 15 0.38 (16.25011d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	11	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	11	11	8184.367	

Special Requirements

Aperture PA Range 43 to 70 Degrees (V3 264.02746582 to 291.02746582)
Aperture PA Range 189 to 195 Degrees (V3 50.02746582 to 56.02746582)
Aperture PA Range 297 to 305 Degrees (V3 158.02746582 to 166.02746582)

Observation

Proposal 2457, Observation 3

Wed Jul 05 20:00:50 GMT 2023

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
(3)	SDSS-J083448.48+015921.1	RA: 08 34 48.4830 (128.7020125d) Dec: +01 59 21.17 (1.98921d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	10	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	10	10	7440.334	

Special Requirements

Aperture PA Range 0 to 14 Degrees (V3 221.02746582 to 235.02746582)
Aperture PA Range 37 to 70 Degrees (V3 258.02746582 to 291.02746582)
Aperture PA Range 106 to 117 Degrees (V3 327.02746582 to 338.02746582)
Aperture PA Range 182 to 190 Degrees (V3 43.02746582 to 51.02746582)
Aperture PA Range 270 to 286 Degrees (V3 131.02746582 to 147.02746582)

Observation

Proposal 2457, Observation 4

Wed Jul 05 20:00:50 GMT 2023

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
(4)	SDSS-J123241.73+091209.3	RA: 12 32 41.7378 (188.1739075d) Dec: +09 12 9.38 (9.20261d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	11	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	11	11	8184.367	

Special Requirements

Aperture PA Range 114 to 130 Degrees (V3 335.02746582 to 351.02746582)
Aperture PA Range 223 to 273 Degrees (V3 84.02746582 to 134.02746582)
Aperture PA Range 350 to 360 Degrees (V3 211.02746582 to 221.02746582)

Observation

Proposal 2457, Observation 54

Wed Jul 05 20:00:50 GMT 2023

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 54:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(4)	SDSS-J123241.73+091209.3	RA: 12 32 41.7378 (188.1739075d) Dec: +09 12 9.38 (9.20261d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	11	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	11	11	8184.367	

Special Requirements

Aperture PA Range 114 to 130 Degrees (V3 335.02746582 to 351.02746582)
Aperture PA Range 223 to 273 Degrees (V3 84.02746582 to 134.02746582)
Aperture PA Range 350 to 360 Degrees (V3 211.02746582 to 221.02746582)

Observation

Proposal 2457, Observation 5

Wed Jul 05 20:00:50 GMT 2023

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
(5)	SDSS-J121704.70+023417.1	RA: 12 17 4.7030 (184.2695958d) Dec: +02 34 17.15 (2.57143d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Quasars]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	10	

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	G235H/F170LP	NRSIRS2	10	1	true	false	NONE	1	1	744.033	
2	G235H/F170LP	NRSIRS2	10	1	false	true	NONE	10	10	7440.334	

Special Requirements

Aperture PA Range 185 to 254 Degrees (V3 46.02746582 to 115.02746582)