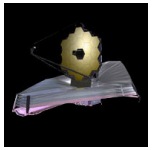

1760 - First accreting black hole candidates: infrared-dropout heavily obscured X-ray AGNs

Cycle: 1, Proposal Category: GO

INVESTIGATORS

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
LID568				
	1	NIRSpec	NIRSpec IFU Spectroscopy	(1) LID568
	2	MIRI	MIRI Low Resolution Spectroscopy	(9) LID568MIRI
LID2176				
	3	NIRspec	NIRSpec IFU Spectroscopy	(2) LID2176
LID2619				
	4	NIRspec	NIRSpec IFU Spectroscopy	(3) LID2619
	5	MIRI	MIRI Low Resolution Spectroscopy	(3) LID2619
LID3488				
	6	NIRSpec	NIRSpec IFU Spectroscopy	(4) LID3488
CID1549				
	7	NIRspec	NIRSpec IFU Spectroscopy	(5) CID1549
LID4959				
	8	NIRspec	NIRSpec IFU Spectroscopy	(6) LID4959
	10	MIRI	MIRI Low Resolution Spectroscopy	(6) LID4959
LID1166				

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
	9	NIRspec	NIRSpec IFU Spectroscopy	(7) LID1166
BACKGROUND				
	11	NIRSpec	NIRSpec IFU Spectroscopy	(8) BACKGROUND

ABSTRACT

We propose to obtain high-resolution NIRspec fixed slits (FS) spectroscopy and MIRI low-resolution slit spectroscopy (LRS) for newly discovered infrared-dropout X-ray sources (i.e., without any optical/NIR counterparts) in the COSMOS field. This is possibly the first population of accreting black holes, and/or heavily obscured AGNs at high redshift, providing a valuable observational constraint on a hidden phase of a significant growth of supermassive black hole (SMBH) in the early universe. Considering that our targets are optically dark, the JWST spectroscopy is the only instrument allowing to obtain the high-resolution IR spectra to detect the emission lines to confirm the spectroscopic redshift and classification for these sources. This proposed study will allow us to explore the most energetic and obscured phase of accreting black holes to understand the formation of SMBHs. Our program will facilitate the first detailed study of yet unknown heavily obscured population at early cosmic epoch.

OBSERVING DESCRIPTION

We will use NIRspec FS high-resolution spectroscopy for 7 objects with robust Spitzer/IRAC 3.6 and 4.5um detections to identify the nature of these sources, whether they are really direct collapse black holes (DCBHs) or a yet undiscovered population of heavily obscured black holes at high redshift. Our primary goal is to detect emission lines in order to obtain the spectroscopic redshift, as well as some other features, e.g., broad-lines and/or outflows. We will use the grating/filter combination of G395M/F290LP with FULL/NRSIRS2RAPID. By using the dual slit dither (S200A1 and S200A2), we will obtain complete wavelength coverage from 2.87um to 5.14um in high-resolution R~2700. We will also use MIRI LRS slit spectroscopy for 3 objects, which are detected in all Spitzer/IRAC and MIPS24um bands, to measure their MIR spectra with significant S/N, covering 5-12um wavelength ranges with R~100.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	LID568	RA: 09 58 44.1577 (149.6839904d) Dec: +02 44 8.67 (2.73574d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(2)	LID2176	RA: 09 59 31.2504 (149.8802100d) Dec: +02 45 8.03 (2.75223d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(3)	LID2619	RA: 09 59 21.4366 (149.8393192d) Dec: +01 34 21.74 (1.57271d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(4)	LID3488	RA: 09 59 0.3370 (149.7514042d) Dec: +01 41 21.96 (1.68943d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(5)	CID1549	RA: 09 59 43.5838 (149.9315992d) Dec: +02 21 6.90 (2.35192d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(6)	LID4959	RA: 10 02 35.2600 (150.6469167d) Dec: +01 36 43.97 (1.61221d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(7)	LID1166	RA: 09 58 26.6220 (149.6109250d) Dec: +01 44 44.13 (1.74559d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*				
(8)	BACKGROUND	RA: 09 58 44.0492 (149.6835383d) Dec: +02 44 14.48 (2.73736d) Equinox: J2000		
Comments: *Category=Calibration* *Description=[Telescope/sky background]*				

	(9)	LID568MIRI	RA: 09 58 44.1577 (149.6839904d) Dec: +02 44 8.67 (2.73574d) Equinox: J2000
	Comments: *Category=Unidentified* *Description=[Infrared sources, X-ray sources]*		

Observation

Proposal 1760, Observation 1: NIRSpec

Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observations:[NIRSpec (Obs 11)]

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)	LID568	RA: 09 58 44.1577 (149.6839904d) Dec: +02 44 8.67 (2.73574d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	2	1	1	1	43.767

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.23

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Sequence Observations 1, 11, Non-interruptible Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 2: MIRI Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Low Resolution 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
(9)	LID568MIRI	RA: 09 58 44.1577 (149.6839904d) Dec: +02 44 8.67 (2.73574d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F1000W	FASTGRPAVG	10	1	1	111.002	83138.4

Template

Subarray	Obtain Verification Image?
FULL	true

Dithers

#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset
1	ALONG SLIT NOD				

Pointing Verification

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTGRPAVG	10	1	1	111.002	83138.4

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTR1	360	2	4	1	2	4001.608	59539.3

Special Requirements

Background Limited. Background no more than 10th percentile above minimum

Observation

Proposal 1760, Observation 3: NIRspec

Tue Nov 08 00:02:19 GMT 2022

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)	LID2176	RA: 09 59 31.2504 (149.8802100d) Dec: +02 45 8.03 (2.75223d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	2	1	1	1	43.767

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.25

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 4: NIRspec

Tue Nov 08 00:02:19 GMT 2022

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)	LID2619	RA: 09 59 21.4366 (149.8393192d) Dec: +01 34 21.74 (1.57271d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	2	1	1	1	43.767

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.26

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 5: MIRI Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Low Resolution 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
(3)	LID2619	RA: 09 59 21.4366 (149.8393192d) Dec: +01 34 21.74 (1.57271d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F1000W	FASTGRPAVG8	10	1	1	222.003	83138.10

Template

Subarray	Obtain Verification Image?
FULL	true

Dithers

#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset
1	ALONG SLIT NOD				

Pointing Verification

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTGRPAVG8	10	1	1	222.003	83138.10

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTR1	360	2	4	1	2	4001.608	59539.11

Special Requirements

Background Limited. Background no more than 10th percentile above minimum

Observation

Proposal 1760, Observation 6: NIRSpec Tue Nov 08 00:02:19 GMT 2022

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
(4)	LID3488	RA: 09 59 0.3370 (149.7514042d) Dec: +01 41 21.96 (1.68943d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	2	1	1	1	43.767

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.27

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 7: NIRspec

Tue Nov 08 00:02:19 GMT 2022

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
(5)	CID1549	RA: 09 59 43.5838 (149.9315992d) Dec: +02 21 6.90 (2.35192d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	2	1	1	1	43.767

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.28

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 8: NIRspec

Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 8:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(6)	LID4959	RA: 10 02 35.2600 (150.6469167d) Dec: +01 36 43.97 (1.61221d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	2	1	1	1	43.767

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.29

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 10: MIRI

Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: MIRI Low Resolution Spectroscopy

Diagnostics

(Visit 10:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(6)	LID4959	RA: 10 02 35.2600 (150.6469167d) Dec: +01 36 43.97 (1.61221d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Acquisition

#	Target	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SAME	F1000W	FASTGRPAVG	4	1	1	44.401	83138.20

Template

Subarray	Obtain Verification Image?
FULL	true

Dithers

#	Dither Type	No. Spectral Steps	Spectral Step Offset	No. Spatial Steps	Spatial Step Offset
1	ALONG SLIT NOD				

Pointing Verification

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTGRPAVG	4	1	1	44.401	83138.20

Spectral Elements

#	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Exposures/Dith	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	FASTR1	360	2	4	1	2	4001.608	59539.21

Special Requirements

Background Limited. Background no more than 10th percentile above minimum

Observation

Proposal 1760, Observation 9: NIRspec Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Diagnostics

(Visit 9:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(7)	LID1166	RA: 09 58 26.6220 (149.6109250d) Dec: +01 44 44.13 (1.74559d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Infrared sources, X-ray sources]

Template

TA Method
VERIFY_ONLY

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

Pointing Verification

#	PV MSA Configuration	Filter	PV Readout Pattern	PV Groups/Int	PV Integrations/Exp	PV Total Dithers	PV Total Integrations	PV Total Exposure Time
1	ALLOPEN	CLEAR	NRSIRS2RAPID	3	1	1	1	58.356

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	83138.30

Special Requirements	
	Background Limited. Background no more than 10th percentile above minimum Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days

Observation

Proposal 1760, Observation 11: NIRSpec

Tue Nov 08 00:02:19 GMT 2022

Diagnostic Status: Warning

Observing Template: NIRSpec IFU Spectroscopy

Background Observation For: [NIRSpec (Obs 1)]

Diagnostics

(Visit 11:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(8)	BACKGROUND	RA: 09 58 44.0492 (149.6835383d) Dec: +02 44 14.48 (2.73736d) Equinox: J2000		

Comments:
Category=Calibration
Description=[Telescope/sky background]

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	MEDIUM	1	4	

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	G395M/F290LP	NRSIRS2	18	1	false	true	NONE	4	4	5310.356	

Special Requirements

Background Limited. Background no more than 10th percentile above minimum

Sequence Observations 1, 11, Non-interruptible
Group Observations 1, 3, 4, 6, 7, 8, 9, 11 within 7 Days