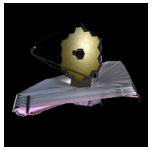

1928 - Blowing star formation away: unraveling molecular winds in AGN

Cycle: 1, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
Dr. Rogemar Andre Riffel (PI)	**Universidade Federal de Santa Maria**
Dr. Nadia L Zakamska (CoI) (CoPI) (US Admin CoI)	The Johns Hopkins University
Marina Bianchin (CoI)	University of California - Irvine
Dr. Thaisa Storchi-Bergmann (CoI)	Universidade Federal do Rio Grande do Sul
Dr. Rogerio Riffel (CoI)	Universidade Federal do Rio Grande do Sul

OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
NGC3884				
	1	NIRSpec_NGC3884	NIRSpec IFU Spectroscopy	(1) NGC3884-NIRSPEC
	2	MIRI_NGC3884	MIRI Medium Resolution Spectroscopy	(2) NGC3884-MIRI
	3	MIRI_NGC3884_bg	MIRI Medium Resolution Spectroscopy	(3) NGC3884-BG
CGCG012-070				
	4	NIRSpec_CGCG012-070	NIRSpec IFU Spectroscopy	(4) CGCG-012-070-NIRSPEC
	5	MIRI_CGCG012-070	MIRI Medium Resolution Spectroscopy	(5) CGCG-012-070-MIRI
	6	MIRI_CGCG012-70_bg	MIRI Medium Resolution Spectroscopy	(6) CGCG012-070-BG
UGC-08782				
	7	NIRSpec_UGC-08782	NIRSpec IFU Spectroscopy	(7) UGC-08782-NIRSPEC
	8	MIRI_UGC-08782	MIRI Medium Resolution Spectroscopy	(8) UGC-08782-MIRI
	9	MIRI_UGC-08782_bg	MIRI Medium Resolution Spectroscopy	(9) UGC-08782-MIRI-BG

ABSTRACT

Winds powered by radiation from active galactic nuclei (AGN) are thought to critically affect galaxy evolution. The fate of molecular gas in such outflows is one of the most important unsolved questions in galaxy evolution: if we find that winds can entrain, reheat or remove molecular gas from galaxies we will prove that AGN can quench star formation in its host galaxy and enable the first studies of this key stage of AGN feedback. However, despite years of searches with ground-based telescopes, only a few molecular outflows are known among AGN in the local universe. Here we propose MIRI and NIRSpec IFU observations to spatially resolve the molecular gas kinematics in the three most promising hosts of strong molecular outflows identified from Spitzer and SDSS spectroscopy. These observations will be used in a detailed investigation to reveal if the molecular gas demonstrates the kinematics commensurate with the wind hypothesis. Furthermore, the JWST data will allow the first in-depth studies of the impact of the AGN on the molecular gas in their hosts.

OBSERVING DESCRIPTION

We will be observing three local Universe AGN host galaxies using a combination of NIRSpec and MIRI IFUs. The targets were selected as being very promissing hosts of strong molecular outflows. The warm gas phase will be observed through MIR H2 emission lines, while the hot phase is traced by the NIR H2 emission. Several emission lines from ionized gas will be used to trace the ionized outflows, which will allow us to characterize the multi-phase outflows.

The following observing modes per object are:

NGC3884 -- acquisition: point & shoot for both NIRSpec and MIRI
- NIRSpec IFU with G235H/F170LP:
  9-point "small cycling" dither pattern
  15 groups and 1 integration per dither position
  Readout mode: NRSIR2RAPID
  --> total exposure time on source: 35 min
  leakeage exposure 3.9 min
- MIRI IFU with MEDIUM and LONG wavelength setting:
  4-point dither pattern
  36 groups and 1 integration per dither position

Readout mode: SLOWR1
--> total exposure time on source 2 x 57min = 1h 54min
1 background image slightly offset from target position for every spectral setting 2 x 14.3 min = 28.6 min

CGCG012-070 -- acquisition: point & shoot for both NIRSpec and MIRI
- NIRSpec IFU with G235H/F170LP:
6-point "small cycling" dither pattern
40 groups and 1 integration per dither position
Readout mode: NRSIR2RAPID
--> total exposure time on source: 1h
leakeage exposure 10 min
- MIRI IFU with SHORT and LONG wavelength setting:
4-point dither pattern
24 groups and 1 integration per dither position
Readout mode: SLOWR1
--> total exposure time on source 2 x 38min = 1h 16 min
1 background image slightly offset from target position for every spectral setting 2 x 9.5 min = 19 min

UGC08782 -- acquisition: point & shoot for both NIRSpec and MIRI
- NIRSpec IFU with G235H/F170LP:
6-point "small cycling" dither pattern
40 groups and 1 integration per dither position
Readout mode: NRSIR2RAPID
--> total exposure time on source: 1h
leakeage exposure 10 min
- MIRI IFU with SHORT and LONG wavelength setting:
4-point dither pattern
30 groups and 1 integration per dither position
Readout mode: SLOWR1

--> total exposure time on source 2 x 47.7min = 1h 35min

1 background image slightly offset from target position for every spectral setting 2 x 12 min = 24 min

Total requested time: 8.86 hours of science time and 7.34 hours of overheads.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	NGC3884-NIRSPEC	RA: 11 46 12.1816 (176.5507567d) Dec: +20 23 29.92 (20.39164d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]* *Extended=YES*				
(2)	NGC3884-MIRI	RA: 11 46 12.1816 (176.5507567d) Dec: +20 23 29.92 (20.39164d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]* *Extended=YES*				
(3)	NGC3884-BG	RA: 11 46 9.0000 (176.5375000d) Dec: +20 23 29.00 (20.39139d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Blank field]*				
(4)	CGCG-012-070-NIRSPEC	RA: 11 44 28.7952 (176.1199800d) Dec: -03 34 15.06 (-3.57085d) Equinox: J2000		
Comments: This object was generated by the targetselector and retrieved from the NED database. *Category=Galaxy* *Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]* *Extended=YES*				
(5)	CGCG-012-070-MIRI	RA: 11 44 28.7952 (176.1199800d) Dec: -03 34 15.06 (-3.57085d) Equinox: J2000		
Comments: This object was generated by the targetselector and retrieved from the NED database. *Category=Galaxy* *Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]* *Extended=YES*				
(6)	CGCG012-070-BG	RA: 11 44 27.0000 (176.1125000d) Dec: -03 34 28.00 (-3.57444d) Equinox: J2000		
Comments: *Category=Unidentified* *Description=[Blank field]*				
(7)	UGC-08782-NIRSPEC	RA: 13 52 17.8416 (208.0743400d) Dec: +31 26 46.50 (31.44625d) Equinox: J2000		
Comments: This object was generated by the targetselector and retrieved from the NED database. *Category=Galaxy* *Description=[Active galactic nuclei, BL Lacertae objects, Galaxy nuclei]*				

(8)	UGC-08782-MIRI	RA: 13 52 17.8416 (208.0743400d) Dec: +31 26 46.50 (31.44625d) Equinox: J2000
Comments: This object was generated by the targetselector and retrieved from the NED database. *Category=Galaxy* *Description=[Active galactic nuclei, BL Lacertae objects, Galaxy nuclei]* *Extended=YES*		
(9)	UGC-08782-MIRI-BG	RA: 13 52 18.0000 (208.0750000d) Dec: +31 27 14.00 (31.45389d) Equinox: J2000
Comments: *Category=Unidentified* *Description=[Blank field]*		

Observation

Proposal 1928, Observation 1: NIRSpec_NGC3884 Thu Apr 06 19:00:27 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)	NGC3884-NIRSPEC	RA: 11 46 12.1816 (176.5507567d) Dec: +20 23 29.92 (20.39164d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	1	9	

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	NRSIRS2RAPID	15	1	false	true	NONE	9	9	2100.8	
2	G235H/F170LP	NRSIRS2RAPID	15	1	true	false	NONE	1	1	233.422	

Observation

Proposal 1928, Observation 2: MIRI_NGC3884 Thu Apr 06 19:00:27 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI_NGC3884_bg (Obs 3)]

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)	NGC3884-MIRI	RA: 11 46 12.1816 (176.5507567d) Dec: +20 23 29.92 (20.39164d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	LONG(C)	MRSLONG		SLOWR1	36	1	1	Dither 1	4	4	3440.148	
1	LONG(C)	MRSSHORT		SLOWR1	36	1	1	Dither 1	4	4	3440.148	
2	MEDIUM(B)	MRSLONG		SLOWR1	36	1	1	Dither 1	4	4	3440.148	
2	MEDIUM(B)	MRSSHORT		SLOWR1	36	1	1	Dither 1	4	4	3440.148	

Special Requirements	Sequence Observations 2, 3, Non-interruptible

Observation

Proposal 1928, Observation 3: MIRI_NGC3884_bg Thu Apr 06 19:00:27 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI_NGC3884 (Obs 2)]

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)	NGC3884-BG	RA: 11 46 9.0000 (176.5375000d) Dec: +20 23 29.00 (20.39139d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Blank field]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE
2	2-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	LONG(C)	MRSLONG		SLOWR1	36	1	1	None	1	1	860.037	
1	LONG(C)	MRSSHORT		SLOWR1	36	1	1	None	1	1	860.037	
2	MEDIUM(B)	MRSLONG		SLOWR1	36	1	1	None	1	1	860.037	
2	MEDIUM(B)	MRSSHORT		SLOWR1	36	1	1	None	1	1	860.037	

Special Requirements	Sequence Observations 2, 3, Non-interruptible

Observation

Proposal 1928, Observation 4: NIRSpec_CGCG012-070 Thu Apr 06 19:00:27 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)	CGCG-012-070-NIRSPEC	RA: 11 44 28.7952 (176.1199800d) Dec: -03 34 15.06 (-3.57085d) Equinox: J2000		

Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=Galaxy
Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]
Extended=YES

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	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	G235H/F170LP	NRSIRS2RAPID	40	1	false	true	NONE	6	6	3588.867	
2	G235H/F170LP	NRSIRS2RAPID	40	1	true	false	NONE	1	1	598.144	

Observation

Proposal 1928, Observation 5: MIRI_CGCG012-070 Thu Apr 06 19:00:27 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI_CGCG012-70_bg (Obs 6)]

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)	CGCG-012-070-MIRI	RA: 11 44 28.7952 (176.1199800d) Dec: -03 34 15.06 (-3.57085d) Equinox: J2000		

Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=Galaxy
Description=[Active galactic nuclei, Galaxy circumnuclear disk, Galaxy nuclei]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	EXTENDED SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SHORT(A)	MRSLONG		SLOWR1	24	1	1	Dither 1	4	4	2293.432	
1	SHORT(A)	MRSSHORT		SLOWR1	24	1	1	Dither 1	4	4	2293.432	
2	LONG(C)	MRSLONG		SLOWR1	24	1	1	Dither 1	4	4	2293.432	
2	LONG(C)	MRSSHORT		SLOWR1	24	1	1	Dither 1	4	4	2293.432	

Special Requirements	Sequence Observations 5, 6, Non-interruptible

Observation

Proposal 1928, Observation 6: MIRI_CGCG012-70_bg Thu Apr 06 19:00:27 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI_CGCG012-070 (Obs 5)]

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
(6)	CGCG012-070-BG	RA: 11 44 27.0000 (176.1125000d) Dec: -03 34 28.00 (-3.57444d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Blank field]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SHORT(A)	MRSLONG		SLOWR1	24	1	1	None	1	1	573.358	
1	SHORT(A)	MRSSHORT		SLOWR1	24	1	1	None	1	1	573.358	
2	LONG(C)	MRSLONG		SLOWR1	24	1	1	None	1	1	573.358	
2	LONG(C)	MRSSHORT		SLOWR1	24	1	1	None	1	1	573.358	

Special Requirements

Sequence Observations 5, 6, Non-interruptible

Observation

Proposal 1928, Observation 7: NIRSpec_UGC-08782 Thu Apr 06 19:00:27 GMT 2023

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
(7)	UGC-08782-NIRSPEC	RA: 13 52 17.8416 (208.0743400d) Dec: +31 26 46.50 (31.44625d) Equinox: J2000		

Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=Galaxy
Description=[Active galactic nuclei, BL Lacertae objects, Galaxy nuclei]

Template

TA Method
NONE

Dithers

#	Dither Type	Size	Starting Point	Number of Points	Points
1	CYCLING	SMALL	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	G235H/F170LP	NRSIRS2RAPID	40	1	false	true	NONE	6	6	3588.867	
2	G235H/F170LP	NRSIRS2RAPID	40	1	true	false	NONE	1	1	598.144	

Observation

Proposal 1928, Observation 8: MIRI_UGC-08782 Thu Apr 06 19:00:27 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[MIRI_UGC-08782_bg (Obs 9)]

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
(8)	UGC-08782-MIRI	RA: 13 52 17.8416 (208.0743400d) Dec: +31 26 46.50 (31.44625d) Equinox: J2000		

Comments: This object was generated by the targetselector and retrieved from the NED database.
Category=Galaxy
Description=[Active galactic nuclei, BL Lacertae objects, Galaxy nuclei]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	POINT SOURCE	NEGATIVE

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SHORT(A)	MRSLONG		SLOWR1	30	1	1	Dither 1	4	4	2866.79	
1	SHORT(A)	MRSSHORT		SLOWR1	30	1	1	Dither 1	4	4	2866.79	
2	LONG(C)	MRSLONG		SLOWR1	30	1	1	Dither 1	4	4	2866.79	
2	LONG(C)	MRSSHORT		SLOWR1	30	1	1	Dither 1	4	4	2866.79	

Special Requirements	Sequence Observations 8, 9, Non-interruptible

Observation

Proposal 1928, Observation 9: MIRI_UGC-08782_bg Thu Apr 06 19:00:27 GMT 2023

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [MIRI_UGC-08782 (Obs 8)]

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
(9)	UGC-08782-MIRI-BG	RA: 13 52 18.0000 (208.0750000d) Dec: +31 27 14.00 (31.45389d) Equinox: J2000		

Comments:
Category=Unidentified
Description=[Blank field]

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray
	ALL	NO	FULL

Spectral Elements

#	Wavelength Range	Detector	Filter	Readout Pattern	Groups/Int	Integrations/Exp	Exposures/Dith	Dither	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	SHORT(A)	MRSLONG		SLOWR1	30	1	1	None	1	1	716.698	
1	SHORT(A)	MRSSHORT		SLOWR1	30	1	1	None	1	1	716.698	
2	LONG(C)	MRSLONG		SLOWR1	30	1	1	None	1	1	716.698	
2	LONG(C)	MRSSHORT		SLOWR1	30	1	1	None	1	1	716.698	

Special Requirements

Sequence Observations 8, 9, Non-interruptible