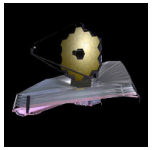

6083 - Probing the ionzing sources of Pox 186: the best local analogue of reionization era galaxies

Cycle: 3, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
Observation Folder				
	1	All bands Bkg	MIRI Medium Resolution Spectroscopy	(2) LEDA-46982-BG
	2	All bands Target	MIRI Medium Resolution Spectroscopy	(1) LEDA-46982

ABSTRACT

One of the frontier goals of observational cosmology is to understand the epoch of reionization and its connection to the early star-forming galaxies, which show several high-ionization lines (e.g., CIV). While these distant sources are too faint to put tight constraints on stellar population models, local metal-poor dwarf galaxies are also found to have similar spectral features in the UV and IR as the high-z galaxies and can be used as reliable analogues. A local (z ~0.0040705), metal-poor (12 + log(O/H) = 7.87) blue compact dwarf galaxy, Pox 186, exhibits the brightest CIII] 1908 A emission (equivalent width, EW ~36 A) observed in the local Universe, along with an extreme [OIII] 88 micron/[CII] 158 micron (~ 10) and a bright optical [OIII]+Hbeta emission (EW~1800A). Such extreme EWs and line ratios are comparable to those observed in galaxies at redshifts of z ~ 6-7, when the reionization process is thought to be completed. We request JWST Cycle 3 time to obtain mid-infrared (MIR) spectroscopy for this galaxy using MIRI/MRS, to obtain high S/N constraints on the high ionization MIR emission lines, as it will allow us map out the shape of the ionizing

spectrum. Uninhibited by dust attenuation, fine-structure lines such as [OIV] will tightly constrain the ionizing spectrum up to and beyond the Helium limit, where the contribution from interacting binaries starts to dominate. We will confront the most recent stellar population models with the myriad of line diagnostics that MIRI will provide and derive the ionizing photon production efficiency of a unique reionization era analogue.

OBSERVING DESCRIPTION

With MIRI, we aim to detect high ionization emission lines such as [ArIII], [OIV], [NeV] related to the hard ionizing radiation.

Observations will be done using all three gratings (A, B and C) and all 4 channels, thus sampling the entire wavelength range accessible by MIRI. We use 4-point dither as they are optimised for the extended source. The background will be determined via IFU Nod-off scene. Simultaneous MIRI imaging are requested as they are highly recommended for astrometry and data quality. No target acquisition is needed.

Proposal 6083 - Targets - Probing the ionzing sources of Pox 186: the best local analogue of reionization era galaxies

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(1)	LEDA-46982	RA: 13 25 48.6410 (201.4526708d) Dec: -11 36 37.94 (-11.61054d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Galaxy* *Description=[Blue compact dwarf galaxies, Compact dwarf galaxy, Dwarf galaxies, Emission line galaxies]* *Extended=YES*				
(2)	LEDA-46982-BG	RA: 13 25 48.6410 (201.4526708d) Dec: -11 36 37.94 (-11.61054d) Equinox: J2000	Epoch of Position: 2015.5	
Comments: This object was generated by the targetselector and retrieved from the SIMBAD database. *Category=Calibration* *Description=[Telescope/sky background]* *Extended=YES*				

Observation

Proposal 6083, Observation 1: All bands Bkg

Fri Apr 18 16:00:08 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [All bands Target (Obs 2)]

Diagnostics

(Visit 1:1) Warning (Form): Data Excess over lower threshold

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

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(2)	LEDA-46982-BG	RA: 13 25 48.6410 (201.4526708d) Dec: -11 36 37.94 (-11.61054d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Calibration
Description=[Telescope/sky background]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	Imager	YES	FULL	Allow Auto Reorder

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	BACKGROUND	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		IMAGER	F560W	FASTR1	15	5	1	Dither 1	4	20	876.913	
1	SHORT(A)	MRSLONG		FASTR1	95	5	1	Dither 1	4	20	5316.977	
1	SHORT(A)	MRSSHORT		FASTR1	95	5	1	Dither 1	4	20	5316.977	
2		IMAGER	F770W	FASTR1	10	5	1	Dither 1	4	20	599.409	
2	MEDIUM(B)	MRSLONG		FASTR1	95	1	1	Dither 1	4	4	1054.515	
2	MEDIUM(B)	MRSSHORT		FASTR1	95	1	1	Dither 1	4	4	1054.515	
3		IMAGER	F1000W	FASTR1	10	5	1	Dither 1	4	20	599.409	
3	LONG(C)	MRSLONG		FASTR1	110	1	1	Dither 1	4	4	1221.018	
3	LONG(C)	MRSSHORT		FASTR1	110	1	1	Dither 1	4	4	1221.018	

Special Requirements	Sequence Observations 1, 2, Non-interruptible

Observation

Proposal 6083, Observation 2: All bands Target

Fri Apr 18 16:00:08 GMT 2025

Diagnostic Status: Warning

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[All bands Bkg (Obs 1)]

Diagnostics

(Visit 2:1) Warning (Form): Data Excess over lower threshold

(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)	LEDA-46982	RA: 13 25 48.6410 (201.4526708d) Dec: -11 36 37.94 (-11.61054d) Equinox: J2000	Epoch of Position: 2015.5	

Comments: This object was generated by the targetselector and retrieved from the SIMBAD database.
Category=Galaxy
Description=[Blue compact dwarf galaxies, Compact dwarf galaxy, Dwarf galaxies, Emission line galaxies]
Extended=YES

Acquisition

#	Target
1	NONE

Template

AcqFilter	Primary Channel	Simultaneous Imaging	Imager Subarray	Grating Wheel Direction
	All MRS	YES	FULL	Allow Auto Reorder

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		IMAGER	F560W	FASTR1	15	5	1	Dither 1	4	20	876.913	
1	SHORT(A)	MRSLONG		FASTR1	95	5	1	Dither 1	4	20	5316.977	
1	SHORT(A)	MRSSHORT		FASTR1	95	5	1	Dither 1	4	20	5316.977	
2		IMAGER	F770W	FASTR1	10	5	1	Dither 1	4	20	599.409	
2	MEDIUM(B)	MRSLONG		FASTR1	95	1	1	Dither 1	4	4	1054.515	
2	MEDIUM(B)	MRSSHORT		FASTR1	95	1	1	Dither 1	4	4	1054.515	
3		IMAGER	F1000W	FASTR1	10	5	1	Dither 1	4	20	599.409	
3	LONG(C)	MRSLONG		FASTR1	110	1	1	Dither 1	4	4	1221.018	
3	LONG(C)	MRSSHORT		FASTR1	110	1	1	Dither 1	4	4	1221.018	

Special Requirements	Sequence Observations 1, 2, Non-interruptible