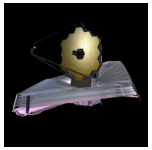

1315 - Quasar Physics with the JWST and MIRI MRS

Cycle: 1, Proposal Category: ERS

(Availability Mode: <TBD>)

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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
MIRI MRS of four Extremely Red Quasars				
	1	J0834+0159	MIRI Medium Resolution Spectroscopy	(1) J0834+0159
	2	J1232+0912	MIRI Medium Resolution Spectroscopy	(2) J1232+0912
	3	J2215-0056	MIRI Medium Resolution Spectroscopy	(3) J2215-0056
	4	J2323-0100	MIRI Medium Resolution Spectroscopy	(4) J2323-0100

ABSTRACT

Our Directors Discretionary time for an Early Release Science (DD-ERS) program will help the community learn about the longest wavelength spectrograph on the James Webb Space Telescope (JWST), the Mid-Infrared Instrument (MIRI) Medium-resolution spectrometer (MRS). We will release a suite of science-enabling products (SEPs) via a public data analysis and code repository that we have already begun to build: github.com/miri-mrs. The accompanying documentation is also already being written: miri-mrs.readthedocs.io. Our primary SEP goal is to produce a Python package that quickly manipulates and analyzes the full MRS Level 3 data, in particular the MRS Spectral Cubes and 1D spectra.

To do this we will observe a set of mid-infrared bright quasars at the peak of cosmological quasar activity, z~2.5. Their global star-formation properties are currently unknown, but spectroscopy with JWST MIRI MRS will quantify the level of star-formation in these objects. These observations will address a major and still open extragalactic astrophysical question: what are the star-formation properties of mid-infrared luminous quasars at the peak of quasar activity? Moreover, the IFU aspect of the MRS will enable investigations of unprecedented detail of both the central AGN IR emission and any potentially extended emission. This novel observation has the capacity to link sites of star-formation to AGN activity and provide direct observational evidence for AGN feedback at high-z and high luminosities.

Our NoI was #87. This proposal, and the accompanying code, calculations and documentation can be found at: github.com/d80b2t.

OBSERVING DESCRIPTION

We propose to use MIRI MRS to observe four IR-bright quasars across the full MRS wavelength range. We will deliver to the community Science Enabling Products (SEPs) that will enable the accumulation, reduction and timely analysis of MRS data, focusing on extra-galactic science.

The four quasars are all well detected in the WISE W3 (7.5-17um) and W4 (20-28um) bands. They were selected via their optical-to-IR color,

initially via the r-W4 color, refined to an i-W3 color selection and are in the SDSS/BOSS quasar catalogs. As such, they have come to be known as ``Extremely Red Quasars'' (ERQs).

We will observe four of these Extremely Red Quasars (ERQs) with the MIRI Medium Resolution Spectrometer. All our targets are within 10 degrees of the Celestial Equator; 3 out of our 4 targets are within 2 degrees. Our targets are at approximately 08h30m, 12h30m, 22h15m and 23h25min, in Right Ascension. We will observe each target for 19973 seconds in total, 12912 seconds of which are Science exposure. We will cover the full wavelength range, 4.9-28.8um, by observing in the SHORT, MEDIUM and LONG modes.

Taking advantage of the PI's host institution, and with continuing consultation with the MIRI team, as well as acknowledging the rationale of the ERS in general, we have decided to focus on one instrument, and one particular mode of that instrument, and make certain that we deliver to the community the highest quality data tools, observational preparation instructions and science enabling products (SEPs).

Our major documentation and notes are kept at::
  github.com/d80b2t/JWST_ERS
with our Observing notes kept at::
  github.com/d80b2t/JWST_ERS/tree/master/ETC_calcs

Observation

Proposal 1315, Observation 1

Thu Aug 17 21:34:19 GMT 2017

Diagnostic Status: No Diagnostics

Observing Template: MIRI Medium Resolution Spectroscopy

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes (micro-Jy)	Miscellaneous
(1)	J0834+0159	RA: 08 34 48.4800 (128.7020000d) Dec: +01 59 21.10 (1.98919d) Equinox: J2000			

Comments: Extended=Unknown

Template

AcqTarget	*AcqFilter*	*Wavelength*	*Primary Channel*	*Simultaneous Imaging*	*Imager Subarray*
1 J0834+0159	F1500W	ALL	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	ALL	Negative

Spectral Elements

#
1
2
3

Observation

Proposal 1315, Observation 2

Thu Aug 17 21:34:19 GMT 2017

Diagnostic Status: No Diagnostics

Observing Template: MIRI Medium Resolution Spectroscopy

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes (micro-Jy)	Miscellaneous
(2)	J1232+0912	RA: 12 32 41.7300 (188.1738750d)	Proper Motion RA: 0.002 mas/yr		
		Dec: +09 12 9.30 (9.20258d)	Proper Motion Dec: 0.002 mas/yr		
		Equinox: J2000	Epoch of Position: 2000.00		

Comments: Extended=Unknown

Template

AcqTarget	*AcqFilter*	*Wavelength*	*Primary Channel*	*Simultaneous Imaging*	*Imager Subarray*
2 J1232+0912	F1500W	ALL	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	ALL	Negative

Spectral Elements

#
1
2
3

Observation

Proposal 1315, Observation 3

Thu Aug 17 21:34:19 GMT 2017

Diagnostic Status: No Diagnostics

Observing Template: MIRI Medium Resolution Spectroscopy

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes (micro-Jy)	Miscellaneous
(3)	J2215-0056	RA: 22 15 24.0000 (333.8500000d) Dec: -00 56 43.80 (-.94550d) Equinox: J2000	Proper Motion RA: 0.002 mas/yr Proper Motion Dec: 0.002 mas/yr Epoch of Position: 2000.00		

Comments: Extended=Unknown

Template

AcqTarget	*AcqFilter*	*Wavelength*	*Primary Channel*	*Simultaneous Imaging*	*Imager Subarray*
3 J2215-0056	F1500W	ALL	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	ALL	Negative

Spectral Elements

#
1
2
3

Observation

Proposal 1315, Observation 4

Thu Aug 17 21:34:19 GMT 2017

Diagnostic Status: No Diagnostics

Observing Template: MIRI Medium Resolution Spectroscopy

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Fluxes (micro-Jy)	Miscellaneous
(4)	J2323-0100	RA: 23 23 26.1700 (350.8590417d)	Proper Motion RA: 0.002 mas/yr		
		Dec: -01 00 33.10 (-1.00919d)	Proper Motion Dec: 0.002 mas/yr		
		Equinox: J2000	Epoch of Position: 2000.00		

Comments: Extended=Unknown

Template

AcqTarget	*AcqFilter*	*Wavelength*	*Primary Channel*	*Simultaneous Imaging*	*Imager Subarray*
4 J2323-0100	F1500W	ALL	ALL	NO	FULL

Dithers

#	Dither Type	Optimized For	Direction
1	4-Point	ALL	Negative

Spectral Elements

#
1
2
3