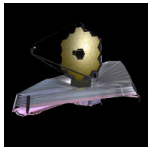

# 1264 - NIRSpec and MIRI IFS of SMGs

Cycle: 1, Proposal Category: GTO

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**OBSERVATIONS**

| *Folder* | *Observation* | *Label* | *Observing Template* | *Science Target* |
|---|---|---|---|---|
| MIRI - GN20 | | | | |
| | 1 | GN20-MRS [WRIGHT_0302] | MIRI Medium Resolution Spectroscopy | (1) GN20-MRS |
| | 2 | GN20-Imager [WRIGHT_0301+0305] | MIRI Imaging | (2) GN20-IMAGER |
| | 3 | GNz11-Imager | MIRI Imaging | (7) GNz11-offset |
| | 16 | GN20-MRS-BGK | MIRI Medium Resolution Spectroscopy | (13) GN20-MRS-BKG |
| MIRI - HFLS3 | | | | |
| | 6 | HFLS3-MRS [WRIGHT_0401] | MIRI Medium Resolution Spectroscopy | (4) HFLS3-MRS |
| | 7 | HFLS3-Imager | MIRI Imaging | (5) HFLS3-IMAGER |
| | 17 | HFLS3-MRS-BGK | MIRI Medium Resolution Spectroscopy | (14) HFLS3-MRS-BKG |

| *Folder* | *Observation* | *Label* | *Observing Template* | *Science Target* |
|---|---|---|---|---|
| MIRI - SPT | | | | |
| | 9 | SPT - MRS | MIRI Medium Resolution Spectroscopy | (6) SPT0311-MRS |
| | 14 | SPT - MRS-BKG | MIRI Medium Resolution Spectroscopy | (12) SPT0311-MRS-BKG |
| | 15 | SPT - Imager | MIRI Imaging | (11) SPT0311-IMAGER |
| NIRSpec - SMGs | | | | |
| | 11 | GN20 - NIRSpec | NIRSpec IFU Spectroscopy | (8) GN20-NIRSPEC |
| | 12 | HFLS3 - NIRSpec | NIRSpec IFU Spectroscopy | (9) HFLS3-NIRSPEC |
| | 13 | SPT0311-58 NIRSpec | NIRSpec IFU Spectroscopy | (10) SPT0311-58-NIRSPEC |

**ABSTRACT**

The observation IDs for the NIRSpec observations are:

GN20  FERRUIT_3049

HFLS3  FERRUIT_3050

And for MIRI:

GN20 MRS and IMAGER  WRIGHT_0301 to 0308

HFLS3 MRS and IMAGER  WRIGHT_0401 to 0403

* UPDATE JUNE 2019: The galaxy SPT0311-5823 has been added to the original proposal.

* UPDATE JUNE 6, 2022: minor modifications in MIRI imager (MIRIM) pointings intended to achieve the optimization of the original science goals for specific roll angle

covered by the LRP observing windows (implemented using the offset requirement).

UPDATE JUNE 17, 2022: 1) NIRCam parallel for GNz11-imager (observation 3) change filters from F115W and F277W to F200W and F356W to optimize wavelength coverage between HST and MIRI band. 2) MIRIM simultaneous to SPT-MRS (obs. 9) and SPT-MRS-BKG (obs. 10) change filters (F1000W to F560W in obs.14 and F560W to F770W in obs.9) for a better coverage of the wavelength range in the simultaneous imaging while MRS prime.

UPDATE OCTOBER 27, 2022 (MIRI updates for GN20 and HFLS3): modifications in the existing APT to optimized the observational strategy based on the analysis of SPT0311 data taken in July: 1) Add MRS  background observations and corresponding new targets (GN20-MRS-BGK and HFLS3-MRS-BGK), 2) remove one of the two MRS configurations previously requested (secondary emission lines), 3) perform one integration per

MRS dither and increase the number of dithers to reduce effect of persistence of cosmic showers, 4) remove the special requirement of interruptible between MRS and MIRIM observations, 5) add MIRIM images in two additional filters to better cover the spectral wavelength in imaging, 6) change MIRIM dither to CYCLING. These changes keep the main science goals and charge times within the previously allocated limits while optimizing the observational strategy. Also, gives more flexibility to schedule MIRI imaging and spectroscopy.

This APT is for MIRI and NIRSpec-IFU observations of 3 high-z dusty, infrared luminous galaxies.

The combination of spectral coverage and subarcsec integral field medium resolution spectroscopy (MRS), makes MIRI a unique instrument to peer into the dustenshrouded phase of IRluminous starforming galaxies (DSFG) at high redshifts. MIRI provides the first direct subarcsec view ever at the (restframe) nearinfrared light distribution of the evolved stellar population, ionized and hot molecular gas phase in z~26 massive DSFGs, and therefore will investigate the physical processes of the obscured star formation and black hole growth in massive starforming galaxies (SFR above 100 Msun/yr) in the early universe. MRS spectroscopy of the main near-infrared emission lines (hydrogen Paschen, [FeII], H2 , etc) will be obtained for the currently known highest redshift DSFGs (SPT0311-5823 and HFLS3), and for GN20, a DSFG at z~4 located in GOODS-North. Mid-IR imaging of the host galaxies and nearby fields will also be obtained with the MIRI imager in the near-IR (i.e. 1.2-1.5 microns) rest-frame (i.e. F770W for GN20 and F1000W for HFLS3 and SPT0311-5823).

The NIRSpec-IFU observations are part of the NIRSpec GTO Physics of Galaxy Assembly IFS survey. The goal of this program is to characterize the internal structure of distant galaxies andthereby investigate the primary physical processes driving galaxy evolution across cosmic time. The main specific objectives are to: trace the distribution of star formation, map the resolved properties of the stellar populations, trace the gas kinematics (i.e. velocity fields, velocity dispersion) and hence determine dynamical masses and also identify non-virial motions (outflow and inflows), map metallicity gradients and dust extinction. These quantities will be mapped for the brightest and most extended star-forming galaxies and AGN/QSO hosts up to z>8.
The NIRSpec-IFU observations are performed at R100 and R2700. The specific band for the high-resolution observations is aimed at including the most important emission lines (from ~ H-beta to H-alpha).

**OBSERVING DESCRIPTION**
The original version of the proposal submitted in 2017 included the IFS observations with MIRI and NIRSpec for two IR luminous galaxies, GN20 and HFLS3. Since the revised 2019 version of the proposal included an additional source, SPT0311-5823.

In the first submission to STScI, the proposal included MIRI and NIRSpec-IFS observations of targets HFLS3 and GN20, and only MIRI IFS of targets GN20a+b. The revised June 2019 submission, includes NIRSPec -IFS and MIRI observations of HFLS3, GN20 and SPT0311, while the MIRI IFS observations of GN20a+b are no longer part of the program, and we included a MIRI image of GN-z11. The total time needed for this proposal has increased with respect to the previous submission, but the total times for the "MIRI high-z" and "NIRSpec GA-IFS" GTO programs are within the internally approved ranges.

MIRI IFS and MIRI Imager:

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The purpose of the program is to get a mid-IR spectra of the high-z IR-luminous galaxies GN20, HFLS3 and SPT0311-5823, using 2 MRS configurations with simultaneous Imager observations of nearby fields in two filters (F560W, F1000W for HFLS3 and SPT0311, F560W and F770W for GN20). In addition, we request the imaging of the host galaxies and surrounding field at 10 microns (F1000W) for HFLS3 and SPT0311-058, and F770W for GN20

A MIRI F560W image of the z~11 candidate GN-z11 and surrounding area will be taken in the GOODS-N field together with the MRS observations of the z~4 DSFG GN20. The MIRIM image of the GN-z11 will take in parallel a NIRCam imaging in two filters of the GN20 host and surrounding area, including GN20a and GN20b. The MIRI and NIRCam images will be combined to explore this region of the GOODS-N field rich in DSFGs. To optimize the overlap region between the MIRI and NIRCam imaging of the GN20 and GN-z11 regions, final adjustments in the position and orientation of the GN-z11 pointing with the MIRI imager by a few arcsec will likely be done once the epoch of the observations is known.

The PAs have been selected to avoid bright stars (which would saturate the detectors) in the MIRI imager fields, and to guarantee low background conditions.

The dithering strategies were selected to optimize the PSF and detector effects for all the MRS channels. HFLS3 and GN20 have sizes of about 1-1.2 arcsec, and therefore a point-like dithering strategy is used as most relevant lines are in channels 2 and 3, SPT0311-5823 is more extended (sizes of about 3 arcsec) and therefore a dithering strategy for extended sources. A dedicated background observation with 2-point dither is included for this galaxy. These strategies could be subject to change without modifying the total charged time, after the assessment of the bakcground properties during the commissioning of the instrument.

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NIRSpec-IFU:
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These three IR-luminous galaxies will be observed using the NIRSpec-IFU as part of the “Physics of Galaxy Assembly IFU survey” program. Observations will be performed with grating/filters PRISM (R100) and G395H/F290LP (R2700). By combining with the MIRI observations, we take advantage of the "smart accounting" option to save slew overheads.

For NIRSpec, the allowed PA range is defined such that contamination in the R100 spectra due to nearby sources leaking through the MSA is minimized. For the emission line high-resolution (R2700) spectra this is not so critical, but still we have checked for very bright sources in the MSA quadrants.

The PA restrictions (updated for the March 2020 submission) are impossed to minimise MSA-leakage, taking also into account the constrains for the MIRI observations.

A 4-point dither pattern will be used, were the first 4 points of the "medium" cycling pattern provide a good compromise between an amplitude (~0.5 ") large enough to "jump" the failed open microsutthers and to deal with other sources of background, while keeping a large FoV with complete exposure time (~2.5"x2.5").  This dither pattern also allows a good sub-pixel sampling.

No extra background exposures are included. For R100 it was considered that there will be a relatively large number of spaxels free from galaxy emission to derive the background. For the R2700, in addition, the goal is to study the emission lines and therefore the background should be less relevant.

Even though the contamination by bright targets leaking through the MSA is expected to be small for the PAs selected (see above),
we take an extra leakage exposure for R100 in one pointing in order to be able to understand the effects of the surronding field.

The IRS2RAPID reading mode was selected to maximise S/N and optimise the detection and removal of cosmic rays .

The exposure times used were computed using JWST ETC (v1.1.1).

**Fixed Targets**

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | GN20-MRS | RA: 12 37 11.8885 (189.2995354d)<br>Dec: +62 22 12.10 (62.37003d)<br>Equinox: J2000 | | |
| *Comments: This object was generated by the target selector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[Active galactic nuclei]* | | | | |
| (2) | GN20-IMAGER | RA: 12 37 13.0365 (189.3043188d)<br>Dec: +62 21 51.63 (62.36434d)<br>Equinox: J2000 | | |
| *Comments: This object was generated by the targetselector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[Active galactic nuclei, Starburst galaxies]* | | | | |
| (4) | HFLS3-MRS | RA: 17 06 47.8000 (256.6991667d)<br>Dec: +58 46 23.51 (58.77320d)<br>Equinox: J2000 | | |
| *Comments: This object was generated by the target selector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[Active galactic nuclei, High-redshift galaxies, Starburst galaxies]* | | | | |
| (5) | HFLS3-IMAGER | RA: 17 06 49.8895 (256.7078729d)<br>Dec: +58 46 10.24 (58.76951d)<br>Equinox: J2000 | | |
| *Comments: This object was generated by the targetselector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[Active galactic nuclei]* | | | | |
| (6) | SPT0311-MRS | RA: 03 11 33.2000 (47.8883333d)<br>Dec: -58 23 33.40 (-58.39261d)<br>Equinox: J2000 | | |
| *Comments: This object was generated by the target selector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*<br>*Extended=YES* | | | | |
| (7) | GNz11-offset | RA: 12 36 19.8900 (189.0828750d)<br>Dec: +62 14 38.72 (62.24409d)<br>Equinox: J2000 | | |
| *Comments: Coordenates are offset from the true values for GNz11 in order to obtain simultaneous MIRI image of GNz11 and NIRCam images of GN20 system for the selected V3 angle. The coordenates of GNz11 (12:36:25.46 +62:14:31.4, target 15) are not used here for centering the MIRI imager.*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies]*<br>*Extended=NO* | | | | |
| (8) | GN20-NIRSPEC | RA: 12 37 11.8999 (189.2995829d)<br>Dec: +62 22 12.10 (62.37003d)<br>Equinox: J2000 | | |
| *Comments:*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies, Starburst galaxies]*<br>*Extended=YES* | | | | |

| | | |
|---|---|---|
| (9) | HFLS3-NIRSPEC | RA: 17 06 47.8000 (256.6991667d)<br>Dec: +58 46 23.51 (58.77320d)<br>Equinox: J2000 |
| *Comments:*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies, Starburst galaxies]*<br>*Extended=YES* | | |
| (10) | SPT0311-58-NIRSPEC | RA: 03 11 33.2600 (47.8885833d)<br>Dec: -58 23 33.50 (-58.39264d)<br>Equinox: J2000 |
| *Comments: Coordinates from Figure 1 in Marrone+18 adjusting FoV*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*<br>*Extended=YES* | | |
| (11) | SPT0311-IMAGER | RA: 03 11 33.2000 (47.8883333d)<br>Dec: -58 23 33.40 (-58.39261d)<br>Equinox: J2000 |
| *Comments: This object was generated by the targetselector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*<br>*Extended=YES* | | |
| (12) | SPT0311-MRS-BKG | RA: 03 11 32.9352 (47.8872300d)<br>Dec: -58 23 42.61 (-58.39517d)<br>Equinox: J2000 |
| *Comments: This object was generated by the targetselector and retrieved from the NED database.*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*<br>*Extended=YES* | | |
| (13) | GN20-MRS-BKG | RA: 12 37 3.6030 (189.2650125d)<br>Dec: +62 21 35.66 (62.35991d)<br>Equinox: J2000 |
| *Comments: background for GN20 MRS observations*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies]*<br>*Extended=YES* | | |
| (14) | HFLS3-MRS-BKG | RA: 17 06 42.5112 (256.6771300d)<br>Dec: +58 45 37.78 (58.76049d)<br>Equinox: J2000 |
| *Comments: background for HFLS3 MRS observations*<br>*Category=Galaxy*<br>*Description=[High-redshift galaxies]*<br>*Extended=YES* | | |
| (15) | GN-Z11 | RA: 12 36 25.4600 (189.1060833d)<br>Dec: +62 14 31.40 (62.24206d)<br>Equinox: J2000 |
| *Comments:*<br>*Category=Galaxy*<br>*Description=[Active galactic nuclei, High-redshift galaxies]*<br>*Extended=NO* | | |

## Observation

**Proposal 1264, Observation 1: GN20-MRS [WRIGHT_0302]** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Medium Resolution Spectroscopy

## Diagnostics

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

(GN20-MRS [WRIGHT_0302] (Obs 1)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (1) | GN20-MRS | RA: 12 37 11.8885 (189.2995354d)<br>Dec: +62 22 12.10 (62.37003d)<br>Equinox: J2000 | | |

*Comments: This object was generated by the target selector and retrieved from the NED database.*
*Category=Galaxy*
*Description=[Active galactic nuclei]*

## Acquisition

| # | Target |
|---|---|
| 1 | NONE |

## Template

| AcqFilter | Primary Channel | Simultaneous Imaging | Imager Subarray | Grating Wheel Direction |
|---|---|---|---|---|
| F560W | All MRS | YES | FULL | NEUTRAL |

## 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 | 114 | 3 | 1 | Dither 1 | 4 | 12 | 3818.455 | |
| 1 | MEDIUM(B) | MRSLONG | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 4 | 4 | 3822.387 | |
| 1 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 4 | 4 | 3822.387 | |
| 2 | | IMAGER | F770W | FASTR1 | 114 | 3 | 1 | Dither 1 | 4 | 12 | 3818.455 | |
| 2 | MEDIUM(B) | MRSLONG | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 4 | 4 | 3822.387 | |
| 2 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 4 | 4 | 3822.387 | |

| Special Requirements | |
|---|---|
| | Aperture PA Range 300 to 310 Degrees (V3 300.0 to 310.0)<br><br>Group Observations 1, 16, Non-interruptible<br>Same Aperture PA 1, 16 |

## Observation

**Proposal 1264, Observation 2: GN20-Imager [WRIGHT_0301+0305]** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Imaging

## 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) | GN20-IMAGER | RA: 12 37 13.0365 (189.3043188d)<br>Dec: +62 21 51.63 (62.36434d)<br>Equinox: J2000 | | |

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

## Template

| Subarray |
|---|
| FULL |

## Dithers

| # | Dither Type | Starting Point | Number of Points | Points | Starting Set | Number of Sets | Optimized For | Direction | Pattern Size |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CYCLING | 1 | 5 | | 2 | 1 | | | MEDIUM |

## Spectral Elements

| # | Filter | Readout Pattern | Groups/Int | Integrations/Exp | Exposures/Dith | Dither | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F560W | FASTR1 | 108 | 1 | 1 | Dither 1 | 5 | 5 | 1498.522 | |
| 2 | F770W | FASTR1 | 108 | 1 | 1 | Dither 1 | 5 | 5 | 1498.522 | |
| 3 | F1280W | FASTR1 | 108 | 1 | 1 | Dither 1 | 5 | 5 | 1498.522 | |

## Special Requirements

Aperture PA Range 304.83425324 to 314.83425324 Degrees (V3 299.99880427 to 309.99880427)

## Observation

**Proposal 1264, Observation 3: GNz11-Imager** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Imaging

Coordinated Parallel Template(s): NIRCam Imaging

## Diagnostics

(Visit 3:1) Warning (Form): Data Excess over lower threshold

(Visit 3:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 3:1) Informational (Form): Visit schedulable, but most scheduling windows are when JWST is pointed in direction of greatest micrometeoroid impact risk. This is likely due to scheduling special requirements.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (7) | GNz11-offset | RA: 12 36 19.8900 (189.0828750d)<br>Dec: +62 14 38.72 (62.24409d)<br>Equinox: J2000 | | |

*Comments: Coordenates are offset from the true values for GNz11 in order to obtain simultaneous MIRI image of GNz11 and NIRCam images of GN20 system for the selected V3 angle. The coordenates of GNz11 (12:36:25.46 +62:14:31.4, target 15) are not used here for centering the MIRI imager.*
*Category=Galaxy*
*Description=[High-redshift galaxies]*
*Extended=NO*

## Template

| MIRI Imaging | NIRCam Imaging |
|---|---|
| Subarray: FULL | Module: ALL<br>Subarray: FULL<br>Target Placement: Module Gap |

## Dithers

| # | Dither Type | Starting Point | Number of Points | Points | Starting Set | Number of Sets | Optimized For | Direction | Pattern Size |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CYCLING | 1 | 7 | | | | | | MEDIUM |
| 2 | CYCLING | 1 | 5 | | | | | | MEDIUM |

## Spectral Elements

| MIRI Imaging | Filter | Readout Pattern | Groups/Int | Integrations/Exp | Exposures/Dith | Dither | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F560W | FASTR1 | 72 | 2 | 1 | Dither 2 | 5 | 10 | 2011.904 | |
| 2 | F770W | FASTR1 | 75 | 2 | 1 | Dither 1 | 7 | 14 | 2933.217 | |
| 3 | F770W | FASTR1 | 75 | 2 | 1 | Dither 1 | 7 | 14 | 2933.217 | |

## Spectral Elements

| NIRCam Imaging | Short Filter | Long Filter | Readout Pattern | Groups/Int | Integrations/Exp | Total Integrations | Total Dithers | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|
| 1 | F200W | F356W | SHALLOW4 | 7 | 1 | 5 | 5 | 1825.251 | |
| 2 | F150W | F277W | SHALLOW4 | 7 | 1 | 7 | 7 | 2555.351 | |
| 3 | F115W | F444W | SHALLOW4 | 7 | 1 | 7 | 7 | 2555.351 | |

| Special Requirements | |
|---|---|
| | Aperture PA Range 304.43544897 to 305.43544897 Degrees (V3 299.6 to 300.6)<br>No Parallel Attachments |

## Observation

**Proposal 1264, Observation 16: GN20-MRS-BGK** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Medium Resolution Spectroscopy

## Diagnostics

(GN20-MRS-BGK (Obs 16)) Warning (Form): Imager Filter overlap.

(Visit 16:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(GN20-MRS-BGK (Obs 16)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (13) | GN20-MRS-BKG | RA: 12 37 3.6030 (189.2650125d)<br>Dec: +62 21 35.66 (62.35991d)<br>Equinox: J2000 | | |

*Comments: background for GN20 MRS observations*
*Category=Galaxy*
*Description=[High-redshift galaxies]*
*Extended=YES*

## Acquisition

| # | Target |
|---|---|
| 1 | NONE |

## Template

| AcqFilter | Primary Channel | Simultaneous Imaging | Imager Subarray | Grating Wheel Direction |
|---|---|---|---|---|
| | All MRS | YES | FULL | NEUTRAL |

## Dithers

| # | Dither Type | Optimized For | Direction |
|---|---|---|---|
| 1 | 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 | | IMAGER | F1800W | FASTR1 | 114 | 3 | 1 | Dither 1 | 2 | 6 | 1909.228 | |
| 1 | MEDIUM(B) | MRSLONG | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 2 | 2 | 1911.194 | |
| 1 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 2 | 2 | 1911.194 | |

| Special Requirements | |
|---|---|
| | Aperture PA Range 300.0 to 310.0 Degrees (V3 300.0 to 310.0)<br><br>Group Observations 1, 16, Non-interruptible<br>Same Aperture PA 1, 16 |

## Observation

**Proposal 1264, Observation 6: HFLS3-MRS [WRIGHT_0401]** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Medium Resolution Spectroscopy

## Diagnostics

(Visit 6:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(HFLS3-MRS [WRIGHT_0401] (Obs 6)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (4) | HFLS3-MRS | RA: 17 06 47.8000 (256.6991667d)<br>Dec: +58 46 23.51 (58.77320d)<br>Equinox: J2000 | | |

*Comments: This object was generated by the target selector and retrieved from the NED database.*
*Category=Galaxy*
*Description=[Active galactic nuclei, High-redshift galaxies, Starburst galaxies]*

## Acquisition

| # | Target |
|---|---|
| 1 | NONE |

## Template

| AcqFilter | Primary Channel | Simultaneous Imaging | Imager Subarray | Grating Wheel Direction |
|---|---|---|---|---|
| F560W | All MRS | YES | FULL | NEUTRAL |

## Dithers

| # | Dither Type | Optimized For | Direction |
|---|---|---|---|
| 1 | 4-Point | POINT SOURCE | POSITIVE |
| 2 | 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 | | IMAGER | F560W | FASTR1 | 114 | 3 | 1 | Dither 1 | 4 | 12 | 3818.455 | |
| 1 | MEDIUM(B) | MRSLONG | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 4 | 4 | 3822.387 | |
| 1 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 4 | 4 | 3822.387 | |
| 2 | | IMAGER | F770W | FASTR1 | 114 | 3 | 1 | Dither 2 | 4 | 12 | 3818.455 | |
| 2 | MEDIUM(B) | MRSLONG | | SLOWR1 | 40 | 1 | 1 | Dither 2 | 4 | 4 | 3822.387 | |
| 2 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 40 | 1 | 1 | Dither 2 | 4 | 4 | 3822.387 | |

| Special Requirements | |
|---|---|
| | Aperture PA Range 287.0 to 287.0 Degrees (V3 287.0 to 287.0)<br><br>Group Observations 6, 17, Non-interruptible<br>Same Aperture PA 6, 17 |

## Observation

**Proposal 1264, Observation 7: HFLS3-Imager**

Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Imaging

## 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) | HFLS3-IMAGER | RA: 17 06 49.8895 (256.7078729d)<br>Dec: +58 46 10.24 (58.76951d)<br>Equinox: J2000 | | |

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

## Template

| Subarray |
|---|
| FULL |

## Dithers

| # | Dither Type | Starting Point | Number of Points | Points | Starting Set | Number of Sets | Optimized For | Direction | Pattern Size |
|---|---|---|---|---|---|---|---|---|---|
| 1 | CYCLING | 1 | 4 | | 2 | 1 | | | MEDIUM |

## Spectral Elements

| # | Filter | Readout Pattern | Groups/Int | Integrations/Exp | Exposures/Dith | Dither | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F560W | FASTR1 | 100 | 1 | 1 | Dither 1 | 4 | 4 | 1110.016 | |
| 2 | F770W | FASTR1 | 100 | 1 | 1 | Dither 1 | 4 | 4 | 1110.016 | |
| 3 | F1280W | FASTR1 | 100 | 1 | 1 | Dither 1 | 4 | 4 | 1110.016 | |

## Special Requirements

Aperture PA Range 291.83425324 to 291.83425324 Degrees (V3 286.99880427 to 286.99880427)

## Observation

**Proposal 1264, Observation 17: HFLS3-MRS-BGK** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Medium Resolution Spectroscopy

## Diagnostics

(HFLS3-MRS-BGK (Obs 17)) Warning (Form): Imager Filter overlap.

(Visit 17:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(HFLS3-MRS-BGK (Obs 17)) Informational (Form): The Visit Planner and Spike may produce different schedulability results.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (14) | HFLS3-MRS-BKG | RA: 17 06 42.5112 (256.6771300d)<br>Dec: +58 45 37.78 (58.76049d)<br>Equinox: J2000 | | |

*Comments: background for HFLS3 MRS observations*
*Category=Galaxy*
*Description=[High-redshift galaxies]*
*Extended=YES*

## Acquisition

| # | Target |
|---|---|
| 1 | NONE |

## Template

| AcqFilter | Primary Channel | Simultaneous Imaging | Imager Subarray | Grating Wheel Direction |
|---|---|---|---|---|
| | All MRS | YES | FULL | NEUTRAL |

## Dithers

| # | Dither Type | Optimized For | Direction |
|---|---|---|---|
| 1 | 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 | | IMAGER | F1800W | FASTR1 | 114 | 3 | 1 | Dither 1 | 2 | 6 | 1909.228 | |
| 1 | MEDIUM(B) | MRSLONG | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 2 | 2 | 1911.194 | |
| 1 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 40 | 1 | 1 | Dither 1 | 2 | 2 | 1911.194 | |

| Special Requirements | |
|---|---|
| | Group Observations 6, 17, Non-interruptible<br>Same Aperture PA 6, 17 |

## Observation

**Proposal 1264, Observation 9: SPT - MRS** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observations:[SPT - MRS-BKG (Obs 14)]

## Diagnostics

(SPT - MRS (Obs 9)) Warning (Form): Filter mismatch between science and background observations may result in incorrect background subtraction.

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

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (6) | SPT0311-MRS | RA: 03 11 33.2000 (47.8883333d)<br>Dec: -58 23 33.40 (-58.39261d)<br>Equinox: J2000 | | |

*Comments: This object was generated by the target selector and retrieved from the NED database.*
*Category=Galaxy*
*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*
*Extended=YES*

## Acquisition

| # | Target |
|---|---|
| 1 | NONE |

## Template

| AcqFilter | Primary Channel | Simultaneous Imaging | Imager Subarray | Grating Wheel Direction |
|---|---|---|---|---|
| | All MRS | YES | FULL | NEUTRAL |

## 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 | F770W | FASTR1 | 111 | 6 | 1 | Dither 1 | 4 | 24 | 7448.207 | |
| 1 | SHORT(A) | MRSLONG | | SLOWR1 | 39 | 2 | 1 | Dither 1 | 4 | 8 | 7549.215 | |
| 1 | SHORT(A) | MRSSHORT | | SLOWR1 | 39 | 2 | 1 | Dither 1 | 4 | 8 | 7549.215 | |
| 2 | | IMAGER | F1000W | FASTR1 | 111 | 6 | 1 | Dither 1 | 4 | 24 | 7448.207 | |
| 2 | MEDIUM(B) | MRSLONG | | SLOWR1 | 39 | 2 | 1 | Dither 1 | 4 | 8 | 7549.215 | |
| 2 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 39 | 2 | 1 | Dither 1 | 4 | 8 | 7549.215 | |

| Special Requirements | |
|---|---|
| | Aperture PA Range 200.0 to 358.0 Degrees (V3 200.0 to 358.0)<br><br>Sequence Observations 9, 14, 15, Non-interruptible |

## Observation

**Proposal 1264, Observation 14: SPT - MRS-BKG** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Medium Resolution Spectroscopy

Background Observation For: [SPT - MRS (Obs 9)]

## Diagnostics

(Visit 14:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (12) | SPT0311-MRS-BKG | RA: 03 11 32.9352 (47.8872300d)<br>Dec: -58 23 42.61 (-58.39517d)<br>Equinox: J2000 | | |

*Comments: This object was generated by the targetselector and retrieved from the NED database.*
*Category=Galaxy*
*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*
*Extended=YES*

## Acquisition

| # | Target |
|---|---|
| 1 | NONE |

## Template

| AcqFilter | Primary Channel | Simultaneous Imaging | Imager Subarray | Grating Wheel Direction |
|---|---|---|---|---|
| | All MRS | YES | FULL | NEUTRAL |

## Dithers

| # | Dither Type | Optimized For | Direction |
|---|---|---|---|
| 1 | 2-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 | 111 | 3 | 1 | Dither 1 | 2 | 6 | 1859.277 | |
| 1 | SHORT(A) | MRSLONG | | SLOWR1 | 39 | 1 | 1 | Dither 1 | 2 | 2 | 1863.414 | |
| 1 | SHORT(A) | MRSSHORT | | SLOWR1 | 39 | 1 | 1 | Dither 1 | 2 | 2 | 1863.414 | |
| 2 | | IMAGER | F560W | FASTR1 | 111 | 3 | 1 | Dither 1 | 2 | 6 | 1859.277 | |
| 2 | MEDIUM(B) | MRSLONG | | SLOWR1 | 39 | 1 | 1 | Dither 1 | 2 | 2 | 1863.414 | |
| 2 | MEDIUM(B) | MRSSHORT | | SLOWR1 | 39 | 1 | 1 | Dither 1 | 2 | 2 | 1863.414 | |

| Special Requirements | |
|---|---|
| | Aperture PA Range 200.0 to 358.0 Degrees (V3 200.0 to 358.0)<br><br>Sequence Observations 9, 14, 15, Non-interruptible |

## Observation

**Proposal 1264, Observation 15: SPT - Imager**

Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: MIRI Imaging

## Diagnostics

(Visit 15:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (11) | SPT0311-IMAGER | RA: 03 11 33.2000 (47.8883333d)<br>Dec: -58 23 33.40 (-58.39261d)<br>Equinox: J2000 | | |

*Comments: This object was generated by the targetselector and retrieved from the NED database.*
*Category=Galaxy*
*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*
*Extended=YES*

## Template

| Subarray |
|---|
| FULL |

## Dithers

| # | Dither Type | Starting Point | Number of Points | Points | Starting Set | Number of Sets | Optimized For | Direction | Pattern Size |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4-Point-Sets | | | | 1 | 1 | POINT SOURCE | POSITIVE | DEFAULT |

## Spectral Elements

| # | Filter | Readout Pattern | Groups/Int | Integrations/Exp | Exposures/Dith | Dither | Total Dithers | Total Integrations | Total Exposure Time | ETC Wkbk.Calc ID |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | F1000W | FASTR1 | 81 | 3 | 1 | Dither 1 | 4 | 12 | 2719.539 | |

## Special Requirements

Aperture PA Range 204.83425324 to 2.83425324 Degrees (V3 199.99880427 to 357.99880427)
Offset 15.0 arcsec, 50.0 arcsec

Sequence Observations 9, 14, 15, Non-interruptible

## Observation

**Proposal 1264, Observation 11: GN20 - NIRSpec** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: NIRSpec IFU Spectroscopy

*Comments: The PA is restricted to minimise potential MSA leakage contamination*

## 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) | GN20-NIRSPEC | RA: 12 37 11.8999 (189.2995829d)<br>Dec: +62 22 12.10 (62.37003d)<br>Equinox: J2000 | | |

*Comments:*
*Category=Galaxy*
*Description=[High-redshift galaxies, Starburst galaxies]*
*Extended=YES*

## 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 | G395H/F290LP | NRSIRS2 | 25 | 1 | false | true | NONE | 4 | 4 | 7352.801 | |
| 2 | PRISM/CLEAR | NRSIRS2RAPID | 60 | 1 | false | true | NONE | 4 | 4 | 3559.689 | |
| 3 | PRISM/CLEAR | NRSIRS2RAPID | 60 | 1 | true | false | NONE | 1 | 1 | 889.922 | |

## Special Requirements

Aperture PA Range 86.89297485 to 91.89297485 Degrees (V3 307.92044067 to 312.92044067)
Aperture PA Range 233.89297485 to 241.89297485 Degrees (V3 94.92044067 to 102.92044067)
Aperture PA Range 328.89297485 to 11.89297485 Degrees (V3 189.92044067 to 232.92044067)

## Observation

**Proposal 1264, Observation 12: HFLS3 - NIRSpec** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: NIRSpec IFU Spectroscopy

*Comments: The PA is restricted to minimise potential MSA leakage contamination*

## Diagnostics

(Visit 12:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (9) | HFLS3-NIRSPEC | RA: 17 06 47.8000 (256.6991667d)<br>Dec: +58 46 23.51 (58.77320d)<br>Equinox: J2000 | | |

*Comments:*
*Category=Galaxy*
*Description=[High-redshift galaxies, Starburst galaxies]*
*Extended=YES*

## 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 | G395H/F290LP | NRSIRS2 | 25 | 1 | false | true | NONE | 4 | 4 | 7352.801 | |
| 2 | PRISM/CLEAR | NRSIRS2RAPID | 60 | 1 | false | true | NONE | 4 | 4 | 3559.689 | |
| 3 | PRISM/CLEAR | NRSIRS2RAPID | 60 | 1 | true | false | NONE | 1 | 1 | 889.922 | |

## Special Requirements

Aperture PA Range 228.892975 to 236.892975 Degrees (V3 89.92044082 to 97.92044082)

## Observation

**Proposal 1264, Observation 13: SPT0311-58 NIRSpec** Tue Oct 03 16:00:33 GMT 2023

**Diagnostic Status: Warning**

Observing Template: NIRSpec IFU Spectroscopy

*Comments: The PA is restricted to minimise potential MSA leakage contamination*

## Diagnostics

(Visit 13:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

## Fixed Targets

| # | Name | Target Coordinates | Targ. Coord. Corrections | Miscellaneous |
|---|---|---|---|---|
| (10) | SPT0311-58-NIRSPEC | RA: 03 11 33.2600 (47.8885833d)<br>Dec: -58 23 33.50 (-58.39264d)<br>Equinox: J2000 | | |

*Comments: Coordinates from Figure 1 in Marrone+18 adjusting FoV*
*Category=Galaxy*
*Description=[High-redshift galaxies, Infrared galaxies, Starburst galaxies]*
*Extended=YES*

## 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 | G395H/F290LP | NRSIRS2 | 25 | 1 | false | true | NONE | 4 | 4 | 7352.801 | |
| 2 | PRISM/CLEAR | NRSIRS2RAPID | 60 | 1 | false | true | NONE | 4 | 4 | 3559.689 | |
| 3 | PRISM/CLEAR | NRSIRS2RAPID | 60 | 1 | true | false | NONE | 1 | 1 | 889.922 | |

## Special Requirements

Aperture PA Range 125.89297485 to 158.89297485 Degrees (V3 346.92044067 to 19.92044067)
Aperture PA Range 238.89297485 to 278.89297485 Degrees (V3 99.92044067 to 139.92044067)
Aperture PA Range 353.89297485 to 1.89297485 Degrees (V3 214.92044067 to 222.92044067)