



# 1204 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Cycle: 1, Proposal Category: GTO

## INVESTIGATORS

| <i>Name</i>                        | <i>Institution</i>           | <i>E-Mail</i>               |
|------------------------------------|------------------------------|-----------------------------|
| <b>Dr. George Rieke (PI)</b>       | <b>University of Arizona</b> | <b>ghrieke@gmail.com</b>    |
| Dr. Stacey Alberts (CoI) (Contact) | University of Arizona        | salberts@email.arizona.edu  |
| Dr. Irene Shivaiei (CoI) (Contact) | University of Arizona        | ishivaiei@email.arizona.edu |
| Dr. Jianwei Lyu (CoI)              | University of Arizona        | jianwei@email.arizona.edu   |

## OBSERVATIONS

| <i>Folder</i> | <i>Observation</i> | <i>Label</i>    | <i>Observing Template</i>           | <i>Science Target</i>       |
|---------------|--------------------|-----------------|-------------------------------------|-----------------------------|
| ULIRGSs       |                    |                 |                                     |                             |
|               | 18                 | IRASF14378-3651 | MIRI Medium Resolution Spectroscopy | (17) Group IRASF14378-GROUP |
|               | 20                 | IRASF17208-0014 | MIRI Medium Resolution Spectroscopy | (18) Group IRASF17208-GROUP |
|               | 21                 | IRASF23365+3604 | MIRI Medium Resolution Spectroscopy | (19) Group IRASF23365-GROUP |
|               | 25                 | IRASF14378SPEC  | NIRSpec IFU Spectroscopy            | (25) IRASF14378-3651-NS     |
|               | 27                 | IRASF17208SPEC  | NIRSpec IFU Spectroscopy            | (26) IRASF17208-0014-NS     |
|               | 28                 | IRASF23365SPEC  | NIRSpec IFU Spectroscopy            | (27) IRASF23365+3604-NS     |

## ABSTRACT

The possibility that the apparent association between the most luminous AGNs and global star formation is just a result of a common dependence on galaxy mass would indicate that the peaks of star formation and black hole accretion are well separated in time. This leaves the possibility that nascent AGNs are just starting to emit in the cores of the most dramatic star forming galaxies, as predicted by some theoretical simulations; the period as a merger is being completed should be when the AGN is accreting most rapidly and is bright. To probe this possibility requires

observational indicators of very weak AGN that are robust against extinction and cannot be confused by star formation. Under this program (ID 1204), we will use a number of mid-infrared indicators to test for embedded AGN in a small number of nearby ULIRGs.

## **OBSERVING DESCRIPTION**

We propose an efficient observational approach, using only the Band A position of the MIRI Medium Resolution Spectrometer (MRS). The wavelength coverage includes the stellar-dominated continuum from 4.87 - 5.82 microns (channel 1), the 7.7 microns aromatic band and [NeVI] 7.65 microns up to  $z = 0.15$  in channel 2, [NeII] 12.8 microns to  $z = 0.06$  in channel 3, the 11.3 microns aromatic feature above  $z = 0.042$  in the same channel, and [SIII] 18.71 microns to  $z = 0.12$  in channel 4. Because the AGN are expected to grow rapidly and thus be luminous during the final stages of mergers, we have selected targets in merger stages 4, 5, or 6. Our target list is therefore IRAS 12112+0305 ( $z = 0.07332$ , merger = 4); 14378-3651 ( $z = 0.0676$ , merger = 6); 17208-0014 ( $z = 0.0428$ , merger = 5); and 23365+3604 ( $z = 0.06444$ , merger = 5) four ULIRGs with no, or weak and conflicting, evidence for AGNs.

A challenge for this program is obtaining a very accurate relative response function at the wavelengths of the [Ne VI] line (as redshifted) so we can detect it even at very small equivalent widths.

We address this with a 4-pt dither so the spectra come up on a variety of different pixels.

A useful complement to these measurements is that all of these galaxies have archival spectra from the IRS on Spitzer, providing the possibility to compare feature strengths in the relatively large slit of that instrument with the detailed spatial resolution of the same regions with the MIRI IFU. In addition, we are obtaining NIRSpect IFU spectra at a resolution of about 3000 to look for any broad components on the hydrogen recombination lines and to document the behavior of the SEDs from 4.5 - 5.3 microns to match to the MIRI spectra.

Note: a fifth target, 15327+2320 (Arp 220,  $z = 0.0181$ , merger = 4), is being done in collaboration with the MIRI EC team in proposal 1267.

Proposal 1204 - Targets - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

| #  | Name                   | Target Coordinates   | Targ. Coord. Corrections   | Miscellaneous |
|--|------------------------|--|--|---------------|
| (3)  | IRASF14378-3651        | RA: 14 40 59.0100 (220.2458750d)<br>Dec: -37 04 31.92 (-37.07553d)<br>Equinox: J2000 | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0  |               |
| <i>Comments:</i><br>Category=Galaxy<br>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]<br>Extended=YES |                        |  |  |               |
| (7)  | IRASF17208-0014        | RA: 17 23 21.9510 (260.8414625d)<br>Dec: -00 17 0.74 (-.28354d)<br>Equinox: J2000    | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0<br>Parallax: 0.0"<br>Epoch of Position: 2000         |               |
| <i>Comments:</i><br>Category=Galaxy<br>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]<br>Extended=YES |                        |  |  |               |
| (9)  | IRASF23365+3604        | RA: 23 39 1.2700 (354.7552917d)<br>Dec: +36 21 8.56 (36.35238d)<br>Equinox: J2000    | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0<br>Parallax: 0.0"<br>Epoch of Position: 2000         |               |
| <i>Comments:</i><br>Category=Galaxy<br>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]<br>Extended=YES |                        |  |  |               |
| (11)   | IRASF14378BACK         | RA: 14 40 59.9100 (220.2496250d)<br>Dec: -37 04 31.92 (-37.07553d)<br>Equinox: J2000 | Proper Motion RA: 0 mas/yr<br>Proper Motion Dec: 0 mas/yr<br>Parallax: 0"<br>Epoch of Position: 2000 |               |
| <i>Comments:</i><br>Category=Calibration<br>Description=[External flat field]  |                        |  |  |               |
| (13)   | IRASF17208BACK         | RA: 17 23 21.9510 (260.8414625d)<br>Dec: -00 17 10.74 (-.28632d)<br>Equinox: J2000   | Proper Motion RA: 0 mas/yr<br>Proper Motion Dec: 0 mas/yr<br>Parallax: 0"<br>Epoch of Position: 2000 |               |
| <i>Comments:</i><br>Category=Calibration<br>Description=[External flat field]  |                        |  |  |               |
| (14)   | IRASF23365BACK         | RA: 23 39 1.2700 (354.7552917d)<br>Dec: +36 21 18.56 (36.35516d)<br>Equinox: J2000   | Proper Motion RA: 0 mas/yr<br>Proper Motion Dec: 0 mas/yr<br>Parallax: 0"<br>Epoch of Position: 2000 |               |
| <i>Comments:</i><br>Category=Calibration<br>Description=[External flat field]  |                        |  |  |               |
| (17)   | Group IRASF14378-GROUP |  |  |               |
| <i>Comments:</i><br>Target Selection=[3 IRASF14378-3651, 11 IRASF14378BACK]  |                        |  |  |               |

Fixed Targets

## Proposal 1204 - Targets - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

|  |                        |  |  |  |
|--|------------------------|--|--|--|
| (18)   | Group IRASF17208-GROUP |  |  |  |
| <i>Comments:</i><br><i>Target Selection=[7 IRASF17208-0014, 13 IRASF17208BACK]</i>   |                        |  |  |  |
| (19)   | Group IRASF23365-GROUP |  |  |  |
| <i>Comments:</i><br><i>Target Selection=[9 IRASF23365+3604, 14 IRASF23365BACK]</i>   |                        |  |  |  |
| (25)   | IRASF14378-3651-NS     | RA: 14 40 59.0100 (220.2458750d)<br>Dec: -37 04 31.92 (-37.07553d)<br>Equinox: J2000 | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0  |  |
| <i>Comments: Duplicate of target 3 for NIRSpec observations that do not need a linked background.</i><br><i>Category=Galaxy</i><br><i>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]</i><br><i>Extended=YES</i> |                        |  |  |  |
| (26)   | IRASF17208-0014-NS     | RA: 17 23 21.9510 (260.8414625d)<br>Dec: -00 17 0.74 (-.28354d)<br>Equinox: J2000    | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0<br>Parallax: 0.0"<br>Epoch of Position: 2000 |  |
| <i>Comments: Duplicate of target 7 for NIRSpec observations that do not need a linked background.</i><br><i>Category=Galaxy</i><br><i>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]</i><br><i>Extended=YES</i> |                        |  |  |  |
| (27)   | IRASF23365+3604-NS     | RA: 23 39 1.2700 (354.7552917d)<br>Dec: +36 21 8.56 (36.35238d)<br>Equinox: J2000    | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0<br>Parallax: 0.0"<br>Epoch of Position: 2000 |  |
| <i>Comments: Duplicate of target 9 for NIRSpec observations that do not need a linked background.</i><br><i>Category=Galaxy</i><br><i>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]</i><br><i>Extended=YES</i> |                        |  |  |  |

Proposal 1204 - Observation 18 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Wed Oct 13 22:00:11 GMT 2021

|   |   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
|---|---|-------------------------|---------------------------|---------------|------------------------|-----------------------------|---------------------------------|-----------------------|------------------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>  | <b>Proposal 1204, Observation 18: IRASF14378-3651</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[] |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
|   | (Visit 18:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <b>Fixed Targets</b>  | <b>#</b>  | <b>Name</b>             | <b>Target Coordinates</b> |               |                        |                             | <b>Targ. Coord. Corrections</b> |                       |                        | <b>Miscellaneous</b> |                           |                            |                         |
|   | (17)  | Group IRASF14378-GROUP  |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <i>Comments:</i><br>Target Selection=[3 IRASF14378-3651, 11 IRASF14378BACK] |   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <b>Acquisition</b>  | <b>#</b>  |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           | <b>Target</b>              |                         |
|   | 1   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           | NONE                       |                         |
| <b>Template</b>   | <b>AcqFilter</b>  | <b>Primary Channel</b>  |                           |               |                        | <b>Simultaneous Imaging</b> |                                 |                       | <b>Imager Subarray</b> |                      |                           |                            |                         |
|   | FND   | ALL                     |                           |               |                        | NO                          |                                 |                       | FULL                   |                      |                           |                            |                         |
| <b>Dithers</b>  | <b>#</b>  | <b>Dither Type</b>      |                           |               |                        | <b>Optimized For</b>        |                                 |                       | <b>Direction</b>       |                      |                           |                            |                         |
|   | 1   | 4-Point                 |                           |               |                        | EXTENDED SOURCE             |                                 |                       | NEGATIVE               |                      |                           |                            |                         |
| <b>Spectral Elements</b>  | <b>#</b>  | <b>Wavelength Range</b> | <b>Detector</b>           | <b>Filter</b> | <b>Readout Pattern</b> | <b>Groups/Int</b>           | <b>Integrations/Exp</b>         | <b>Exposures/Dith</b> | <b>Dither</b>          | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|   | 1   | SHORT(A)                | MRSLONG                   |               | FASTR1                 | 50                          | 3                               | 1                     | Dither 1               | 4                    | 12                        | 1687.224                   |                         |
|   | 1   | SHORT(A)                | MRSSHORT                  |               | FASTR1                 | 50                          | 3                               | 1                     | Dither 1               | 4                    | 12                        | 1687.224                   |                         |

Proposal 1204 - Observation 18 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Special Requirements

Sequence Observations 18, 25 within 30 Days

Proposal 1204 - Observation 20 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Wed Oct 13 22:00:11 GMT 2021

|   |   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
|---|---|-------------------------|---------------------------|---------------|------------------------|-----------------------------|---------------------------------|-----------------------|------------------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>  | <b>Proposal 1204, Observation 20: IRASF17208-0014</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[] |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
|   | (Visit 20:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <b>Fixed Targets</b>  | <b>#</b>  | <b>Name</b>             | <b>Target Coordinates</b> |               |                        |                             | <b>Targ. Coord. Corrections</b> |                       |                        | <b>Miscellaneous</b> |                           |                            |                         |
|   | (18)  | Group IRASF17208-GROUP  |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <i>Comments:</i><br>Target Selection=[7 IRASF17208-0014, 13 IRASF17208BACK] |   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <b>Acquisition</b>  | <b>#</b>  |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           | <b>Target</b>              |                         |
|   | 1   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           | NONE                       |                         |
| <b>Template</b>   | <b>AcqFilter</b>  | <b>Primary Channel</b>  |                           |               |                        | <b>Simultaneous Imaging</b> |                                 |                       | <b>Imager Subarray</b> |                      |                           |                            |                         |
|   | FND   | ALL                     |                           |               |                        | NO                          |                                 |                       | FULL                   |                      |                           |                            |                         |
| <b>Dithers</b>  | <b>#</b>  | <b>Dither Type</b>      |                           |               |                        | <b>Optimized For</b>        |                                 |                       | <b>Direction</b>       |                      |                           |                            |                         |
|   | 1   | 4-Point                 |                           |               |                        | EXTENDED SOURCE             |                                 |                       | NEGATIVE               |                      |                           |                            |                         |
| <b>Spectral Elements</b>  | <b>#</b>  | <b>Wavelength Range</b> | <b>Detector</b>           | <b>Filter</b> | <b>Readout Pattern</b> | <b>Groups/Int</b>           | <b>Integrations/Exp</b>         | <b>Exposures/Dith</b> | <b>Dither</b>          | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|   | 1   | SHORT(A)                | MRSLONG                   |               | FASTR1                 | 50                          | 3                               | 1                     | Dither 1               | 4                    | 12                        | 1687.224                   |                         |
|   | 1   | SHORT(A)                | MRSSHORT                  |               | FASTR1                 | 50                          | 3                               | 1                     | Dither 1               | 4                    | 12                        | 1687.224                   |                         |

Proposal 1204 - Observation 20 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Special Requirements

Sequence Observations 20, 27 within 30 Days



Proposal 1204 - Observation 21 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Wed Oct 13 22:00:12 GMT 2021

|   |   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
|---|---|-------------------------|---------------------------|---------------|------------------------|-----------------------------|---------------------------------|-----------------------|------------------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>  | <b>Proposal 1204, Observation 21: IRASF23365+3604</b><br><b>Diagnostic Status: Warning</b><br>Observing Template: MIRI Medium Resolution Spectroscopy<br>Background Observations:[] |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
|   | (Visit 21:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <b>Fixed Targets</b>  | <b>#</b>  | <b>Name</b>             | <b>Target Coordinates</b> |               |                        |                             | <b>Targ. Coord. Corrections</b> |                       |                        | <b>Miscellaneous</b> |                           |                            |                         |
|   | (19)  | Group IRASF23365-GROUP  |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <i>Comments:</i><br>Target Selection=[9 IRASF23365+3604, 14 IRASF23365BACK] |   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           |                            |                         |
| <b>Acquisition</b>  | <b>#</b>  |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           | <b>Target</b>              |                         |
|   | 1   |                         |                           |               |                        |                             |                                 |                       |                        |                      |                           | NONE                       |                         |
| <b>Template</b>   | <b>AcqFilter</b>  | <b>Primary Channel</b>  |                           |               |                        | <b>Simultaneous Imaging</b> |                                 |                       | <b>Imager Subarray</b> |                      |                           |                            |                         |
|   | FND   | ALL                     |                           |               |                        | NO                          |                                 |                       | FULL                   |                      |                           |                            |                         |
| <b>Dithers</b>  | <b>#</b>  | <b>Dither Type</b>      |                           |               |                        | <b>Optimized For</b>        |                                 |                       | <b>Direction</b>       |                      |                           |                            |                         |
|   | 1   | 4-Point                 |                           |               |                        | EXTENDED SOURCE             |                                 |                       | NEGATIVE               |                      |                           |                            |                         |
| <b>Spectral Elements</b>  | <b>#</b>  | <b>Wavelength Range</b> | <b>Detector</b>           | <b>Filter</b> | <b>Readout Pattern</b> | <b>Groups/Int</b>           | <b>Integrations/Exp</b>         | <b>Exposures/Dith</b> | <b>Dither</b>          | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|   | 1   | SHORT(A)                | MRSLONG                   |               | FASTR1                 | 50                          | 3                               | 1                     | Dither 1               | 4                    | 12                        | 1687.224                   |                         |
|   | 1   | SHORT(A)                | MRSSHORT                  |               | FASTR1                 | 50                          | 3                               | 1                     | Dither 1               | 4                    | 12                        | 1687.224                   |                         |

Proposal 1204 - Observation 21 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Special Requirements

Sequence Observations 21, 28 within 30 Days

Proposal 1204 - Observation 25 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Wed Oct 13 22:00:12 GMT 2021

|                             |   |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |
|-----------------------------|---|-----------------------|--|-------------------|-------------------------|---|-------------------------|----------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>          | <p><b>Proposal 1204, Observation 25: IRASF14378SPEC</b></p> <p><b>Diagnostic Status: Warning</b></p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>  |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |
| <b>Diagnostics</b>          | (Visit 25:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |
| <b>Fixed Targets</b>        | <b>#</b>  | <b>Name</b>           | <b>Target Coordinates</b>  |                   |                         | <b>Targ. Coord. Corrections</b>                 |                         |                | <b>Miscellaneous</b> |                           |                            |                         |
|                             | (25)  | IRASF14378-3651-NS    | RA: 14 40 59.0100 (220.2458750d)<br>Dec: -37 04 31.92 (-37.07553d)<br>Equinox: J2000 |                   |                         | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0 |                         |                |                      |                           |                            |                         |
|                             | <p><i>Comments: Duplicate of target 3 for NIRSpec observations that do not need a linked background.</i></p> <p><i>Category=Galaxy</i></p> <p><i>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]</i></p> <p><i>Extended=YES</i></p> |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |
| <b>Template</b>             | <b>TA Method</b>  |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |
|                             | NONE  |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |
| <b>Dithers</b>              | <b>#</b>  | <b>Dither Type</b>    |  | <b>Size</b>       | <b>Starting Point</b>   |   | <b>Number of Points</b> | <b>Points</b>  |                      |                           |                            |                         |
|                             | 1   | CYCLING               |  | MEDIUM            | 1                       |   | 4                       |                |                      |                           |                            |                         |
| <b>Spectral Elements</b>    | <b>#</b>  | <b>Grating/Filter</b> | <b>Readout Pattern</b>   | <b>Groups/Int</b> | <b>Integrations/Exp</b> | <b>Leakcal</b>                                  | <b>Dither</b>           | <b>Autocal</b> | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|                             | 1   | G395H/F290LP          | NRSIRS2RAPI<br>D   | 8                 | 1                       | false   | true                    | NONE           | 4                    | 4                         | 525.2                      |                         |
|                             | 2   | G235H/F170LP          | NRSIRS2RAPI<br>D   | 9                 | 1                       | false   | true                    | NONE           | 4                    | 4                         | 583.556                    |                         |
|                             | 3   | G140H/F100LP          | NRSIRS2RAPI<br>D   | 9                 | 1                       | false   | true                    | NONE           | 4                    | 4                         | 583.556                    |                         |
| <b>Special Requirements</b> | Sequence Observations 18, 25 within 30 Days   |                       |  |                   |                         |   |                         |                |                      |                           |                            |                         |

Proposal 1204 - Observation 27 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Wed Oct 13 22:00:12 GMT 2021

|                             |   |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |
|-----------------------------|---|-----------------------|---|-------------------|-------------------------|--|-------------------------|----------------|----------------------|---------------------------|----------------------------|-------------------------|
| <b>Observation</b>          | <p><b>Proposal 1204, Observation 27: IRASF17208SPEC</b></p> <p><b>Diagnostic Status: Warning</b></p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>  |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |
| <b>Diagnostics</b>          | (Visit 27:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |
| <b>Fixed Targets</b>        | <b>#</b>  | <b>Name</b>           | <b>Target Coordinates</b>   |                   |                         | <b>Targ. Coord. Corrections</b>  |                         |                | <b>Miscellaneous</b> |                           |                            |                         |
|                             | (26)  | IRASF17208-0014-NS    | RA: 17 23 21.9510 (260.8414625d)<br>Dec: -00 17 0.74 (-.28354d)<br>Equinox: J2000 |                   |                         | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0<br>Parallax: 0.0"<br>Epoch of Position: 2000 |                         |                |                      |                           |                            |                         |
|                             | <p><i>Comments: Duplicate of target 7 for NIRSpec observations that do not need a linked background.</i></p> <p><i>Category=Galaxy</i></p> <p><i>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]</i></p> <p><i>Extended=YES</i></p> |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |
| <b>Template</b>             | <b>TA Method</b>  |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |
|                             | NONE  |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |
| <b>Dithers</b>              | <b>#</b>  | <b>Dither Type</b>    |   | <b>Size</b>       | <b>Starting Point</b>   |  | <b>Number of Points</b> | <b>Points</b>  |                      |                           |                            |                         |
|                             | 1   | CYCLING               |   | MEDIUM            | 1                       |  | 4                       |                |                      |                           |                            |                         |
| <b>Spectral Elements</b>    | <b>#</b>  | <b>Grating/Filter</b> | <b>Readout Pattern</b>  | <b>Groups/Int</b> | <b>Integrations/Exp</b> | <b>Leakcal</b>   | <b>Dither</b>           | <b>Autocal</b> | <b>Total Dithers</b> | <b>Total Integrations</b> | <b>Total Exposure Time</b> | <b>ETC Wkbk.Calc ID</b> |
|                             | 1   | G395H/F290LP          | NRSIRS2RAPI<br>D  | 8                 | 1                       | false  | true                    | NONE           | 4                    | 4                         | 525.2                      |                         |
|                             | 2   | G235H/F170LP          | NRSIRS2RAPI<br>D  | 9                 | 1                       | false  | true                    | NONE           | 4                    | 4                         | 583.556                    |                         |
|                             | 3   | G140H/F100LP          | NRSIRS2RAPI<br>D  | 9                 | 1                       | false  | true                    | NONE           | 4                    | 4                         | 583.556                    |                         |
| <b>Special Requirements</b> | Sequence Observations 20, 27 within 30 Days   |                       |   |                   |                         |  |                         |                |                      |                           |                            |                         |

Proposal 1204 - Observation 28 - Are There AGN Embedded in All Ultraluminous Infrared Galaxies (ULIRGs)?

Wed Oct 13 22:00:12 GMT 2021

|                             |   |                    |   |            |                  |  |                  |         |               |                    |                     |                  |
|-----------------------------|---|--------------------|---|------------|------------------|--|------------------|---------|---------------|--------------------|---------------------|------------------|
| <b>Observation</b>          | <p><b>Proposal 1204, Observation 28: IRASF23365SPEC</b></p> <p><b>Diagnostic Status: Warning</b></p> <p>Observing Template: NIRSpec IFU Spectroscopy</p>  |                    |   |            |                  |  |                  |         |               |                    |                     |                  |
| <b>Diagnostics</b>          | (Visit 28:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.  |                    |   |            |                  |  |                  |         |               |                    |                     |                  |
| <b>Fixed Targets</b>        | #   | Name               | Target Coordinates  |            |                  | Targ. Coord. Corrections   |                  |         | Miscellaneous |                    |                     |                  |
|                             | (27)  | IRASF23365+3604-NS | RA: 23 39 1.2700 (354.7552917d)<br>Dec: +36 21 8.56 (36.35238d)<br>Equinox: J2000 |            |                  | Proper Motion RA: 0.0<br>Proper Motion Dec: 0.0<br>Parallax: 0.0"<br>Epoch of Position: 2000 |                  |         |               |                    |                     |                  |
|                             | <p><i>Comments: Duplicate of target 9 for NIRSpec observations that do not need a linked background.</i></p> <p><i>Category=Galaxy</i></p> <p><i>Description=[Active galaxies, Infrared galaxies, Ultraluminous infrared galaxies]</i></p> <p><i>Extended=YES</i></p> |                    |   |            |                  |  |                  |         |               |                    |                     |                  |
| <b>Template</b>             | <b>TA Method</b>  |                    |   |            |                  |  |                  |         |               |                    |                     |                  |
|                             | NONE  |                    |   |            |                  |  |                  |         |               |                    |                     |                  |
| <b>Dithers</b>              | #   | Dither Type        |   | Size       | Starting Point   |  | Number of Points |         | Points        |                    |                     |                  |
|                             | 1   | CYCLING            |   | MEDIUM     | 1                |  | 4                |         |               |                    |                     |                  |
| <b>Spectral Elements</b>    | #   | 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       | NRSIRS2RAPI D   | 8          | 1                | false  | true             | NONE    | 4             | 4                  | 525.2               |                  |
|                             | 2   | G235H/F170LP       | NRSIRS2RAPI D   | 9          | 1                | false  | true             | NONE    | 4             | 4                  | 583.556             |                  |
|                             | 3   | G140H/F100LP       | NRSIRS2RAPI D   | 9          | 1                | false  | true             | NONE    | 4             | 4                  | 583.556             |                  |
| <b>Special Requirements</b> | Sequence Observations 21, 28 within 30 Days   |                    |   |            |                  |  |                  |         |               |                    |                     |                  |