LBT Observing Log: 2025 Feb 26 UT

Observers: Jenny Power
Partner Observer: Rick Pogge (On-Call)
Telescope Operator: David Gonzalez Huerta

Plan:

Start with LBC's for OSU Monitor program

--- Priority #1 ------

~~I2574~~, ~~M82~~, ~~M81~~, ~~N3489~~, ~~N5194~~ -- 2.2 hours

--- Priority #2 -------

~~N4214~~, N4236, ~~N4258~~, N4826, N5474 -- 3.2 hours
~~N4395~~, ~~N4736~~

--- Priority #3 -------

~~N2403~~, ~~N3077~~, ~~N3344~~, ~~N3627~~, N4449 -- 2.6 hours
N4605

Summary:

- Skyflats
- OSU Monitor
  - Technical loss/Weather - RB_Science and poor seeing (2:07-2:28)
  - N2403 (2:28-2:55)
  - M81 (2:55-3:27)
  - M82 (3:27-3:47)
    - Technical Loss (Retaking elongated image) - (3:47-3:50)
  - I2574 (3:50-4:15)
  - N3077 (4:15-4:38)
  - N3344 (4:38-5:21)
  - N3489 (5:21-6:18)
    - Weather Downtime (Retake images from poor seeing) (6:15-6:23)

N3627 (6:23-7:10)
Technical downtime: DX Primary MIrror Panic (7:10-7:33)
N4214 (7:33-7:58)
N4395 (7:58-8:16)
N4258 (8:16-9:14)
N4736 (9:14-9:44)
N5194 (9:44-10:38)
Seeing/Reconfig (10:38-11:11)
OSU_SCAT
2024igg (Not completed, target not identified)
OSU_lmcsats
NGC5585_dw11 (Not completed - script issue)
OSU_SCAT
Technical issue, guide jump during acquisition (11:40-11:48)
2024iss (11:48-12:39)
SpecPhot - GD153 (12:39-12:57)

Issues:

- DX Primary mirror panic
- Several script issues including:
    - OSU_lmsats scripts are set up with 2.5” longslit which is not a slit we offer. I Suspect they desire the 2.4” longslit but this should be confirmed.
    - OSU_SCAT: unable to identify 2024igg in acquisition image. Recommend a blind offset to acquire. The slit image is also setup to be the same length as the acquisition (90s), this is unnecessary and can be shortened to 20sec.

Weather:

Overview (times are given in UT):

00:55 UT LBCs and MODS have been powered up. LBC biases started. TMS lasers on.

Problems with RB science coming up. Had to bring up one for each side (IT9290)

01:19 Sunset

Error when starting TMS:

****
[Errno 13] Permission denied:
'/lbt/data/share/tms/refs/20250223/tms_pose-dx-lbc-20250223-4.ref'
****
Traceback (most recent call last):
File "/lbt/lbto/supportscripts/MetrologySupport/lbc_tms.py", line 783, in <module>
sx_x=float(result[0].strip("[(,)]"))
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
ValueError: could not convert string to float: 'EC(dx-lbc'

Is this because the last reference was generated by another member account? I will be generating a new reference soon anyways

Skyflats

01:36 UT Sending preset for B & R skyflats on blank field Blank 04+25

Good set of B & R flats at PA 0, PA 180

OSU Monitor

Technical loss/Weather - RB_Science and poor seeing (2:07-2:28)

02:07 12 degree twilight, sending preset for collimation and copointing. Running dohybrid. Huge initial focus offset needed on LBCR ~24000 in z4. DIMM is reporting 1.67". We have been seeing poor seeing just after sunset so I will monitor as we converge to see if this is just a bubble. I strongly suspect this is thermal and will improve soon.

02:24 UT Likely because of the convoluted way with which I had to open RB_science, I am struggling to run lbcrangebal:
ERROR: Cannot open device (node!imtool,,8192,8192)
"display (chp2imgb, 1, zsc+, zra-, >> log)"
line 294: Observe$lbcrangebal.cl
called as: `lbcrangebal (mode=h)

N2403 (2:28-2:55)

Priority3 target

As per Matthieu's suggestion, I am opening RB_Science with:
/lbt/lbto/supportscripts/ObserverSupport/RB_Science_xpa.py
This talked nicely with lbcrangebal.

Radial star offsets from rotator centers: BLUE 10.2" and RED 21.4"

lbcrangebal:

```
------------------------------------------------------------------------
COPOINTING: B=22211 R=22206
Pointing updates: delta_IE = -11.80", delta_CA = -4.07"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
            SX:    0.54     0.22     4.80   -11.51
            DX:   -0.49    -0.18    -3.81    10.62
------------------------------------------------------------------------
```

02:28 UT Seeing continues to be 1.5-1.7”, but the copointing image had seeing around 1.4” I am running dofpia again since that did look a touch soft already.

02:33 UT This dofpia run already shows improvement, and DIMM is now reporting just below 1.5”, slowly improving. We may have some thermal seeing effects for the next hour or so as things cool off, but I believe it is worth continuing with the LBC’s.

02:36 18 degree evening twilight. Dofpia on the red was struggling, with large focus adjustments but it has converged and looks good. Taking TMS reference.

02:43 UT Sending science. Seeing 1.36” on the DIMM and trending down.
lbc_current_plot

02:51 UT IQ 1-1.1” on the images, perhaps a bit better on the blue images.

M81 (2:55-3:27)

Priority1 target

02:55 UT Preset for copointing. LBCB Image elongated for copointing, likely mirror still moving. Double checking tracker and other status quickly, but while I verify instrument and TMS status, I’ll run a quick round of dofpia.

03:00 UT No errors found, but dofpia was beneficial. Focus correction on both blue and red.

Radial star offsets from rotator centers: BLUE 5.2" and RED 6.4"

lbcrangebal:

```
------------------------------------------------------------------------
COPOINTING: B=31149 R=31144
Pointing updates: delta_IE = -2.55", delta_CA = 4.55"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
```

SX: 0.03 0.09 2.02 -0.66
DX: 0.01 -0.08 -1.71 -0.16

03:11 UT Another large temperature change of 0.5C in a few minutes. Seeing is oscillating from 1.3-1.9” on teh DIMM but images looked ok. We will continue.

03:19 UT Although the DIMM reports 1.7-1.8, the guiders are 1.1-1.4” and image IA is 1.1-1.2”. David confirmed the DIMM is functioning ok, but something seems out of whack. Perhaps we are reading a binary or picked a star at a low elevation. Seeing is still not the sub arcsecond ALTA promised.

M82 (3:27-3:47)

Priority1 target

03:27 UT Slewing for copointing. Collimation looks good and this target is nearby, not collimating.

Radial star offsets from rotator centers: BLUE 2.7" and RED 5.3"

lbcrangebal:

COPOINTING: B=32820 R=32815
Pointing updates: delta_IE = 2.77", delta_CA = -2.21"
Mirror updates: dX(mm) dY(mm) dRX(") dRY(")
SX: 0.03 -0.03 -0.57 -0.69
DX: 0.01 0.10 2.10 -0.14

03:31 UT Starting science

03:37 UT Second image looks elongated. I will rerun this script to retake the first image.

----- receiving 'lbcr.20250226.033349.fits' [frame 2] (4.9s/95.3s)
object:M82 | filter:R-BESSEL | exptime:60.24 | pa_pnt:-109.90 | dithoffx:0 | dithoffy:0
----- receiving 'lbcb.20250226.033400.fits' [frame 1] (5.0s/113.7s)
object:M82 | filter:V-BESSEL | exptime:60.29 | pa_pnt:-109.89 | dithoffx:0 | dithoffy:0

Technical Loss (Retaking elongated image) - (3:47-3:50)

Retaking V & R to recover elongated image

RB_Science crashed:
free(): invalid next size (normal)

Unknown error! Please restart (and report the following messages).

(no messages)

I2574 (3:50-4:15)

Priority1 target

03:50 UT Blue was getting soft towards the end so recollimating. Focus on blue needed now.

Radial star offsets from rotator centers: BLUE 1.8" and RED 5.3"

lbcrangebal:

COPOINTING: B=35858 R=35854
Pointing updates: delta_IE = -2.20", delta_CA = -1.44"

Mirror updates:	dX(mm)	dY(mm)	dRX(")	dRY(")
SX:	0.15	0.10	2.15	-3.28
DX:	-0.11	-0.07	-1.55	2.34

04:01 UT Sending science. Seeing 1.1-1.3” on the guiders. Conditions remain clear.

N3077 (4:15-4:38)

Priority3 target

04:15 UT Again blue is a bit soft so running collimation. Seeing 1.5” on the DIMM but IQ on images and guiders has been 1.1-1.3”. Another big focus shift needed for blue. Our temps are not as stable as we would like for LBC’s.

Radial star offsets from rotator centers: BLUE 3.1" and RED 5.3"

lbcrangebal:

COPOINTING: B=42255 R=42251
Pointing updates: delta_IE = -2.83", delta_CA = -3.95"

```
 Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
          SX:    0.07     0.04     0.84    -1.56
          DX:   -0.03     0.00     0.02     0.56
-------------------------------------------------------------------------
```

04:25 UT Science starting.

04:34 UT Seeing continues to get worse. It is around 1.2-1.4” on the images now.

N3344 (4:38-5:21)

Priority3 target

04:38 UT Executing one target to another location in the sky to see if wind directions are impacting our seeing, but things have not been trending in a favorable direction. It may be best to switch to MODS.

04:43 UT lbc_cmu closed when setting up copointing. Bit of a pain because directories have to be traversed and scripts relocated.

Radial star offsets from rotator centers: BLUE 3.5" and RED 6.3"

lbcrangebal:

```
-------------------------------------------------------------------------
COPOINTING: B=44459 R=44457
Pointing updates: delta_IE = 2.54", delta_CA = 3.17"
 Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
          SX:   -0.07     0.02     0.51     1.43
          DX:    0.10     0.04     0.78    -2.23
-------------------------------------------------------------------------
```

04:48 UT Science started. DIMM is measuring seeing of 1.15-1.35” here. So the pointing direction does impact the DIMM reading, this may suggest we had a double star previously. Guiders are still reading 1.2-1.4”

04:56 UT Images showing 1-1.1” seeing at this location.

N3489 (5:21-6:18)

Priority1 target

05:21 UT Preset to target for copointing and collimation. Collimation was ok, but I think that red could use a slight focus tune.

Radial star offsets from rotator centers: BLUE 5.3" and RED 4.7"

lbcrangebal:

```
---------------------------------------------------------------------
COPOINTING: B=53001 R=52957
Pointing updates: delta_IE = -1.25", delta_CA = 0.18"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
            SX:   -0.10    -0.17    -3.67     2.12
            DX:    0.15     0.21     4.54    -3.13
---------------------------------------------------------------------
```

05:31 UT Science! Seeing is 1.3-1.4” on the DIMM,

06:00 UT Seeing still variable but trending down. Seeing 0.9-1.25” on the images.

06:08 UT Seeing has been good on this target with the exception of the first 2 exposures. I am going to repeat those two which were just over 1.5” in the blue.

06:13 UT The temperature has just dropped another degree Celsius.

Weather Downtime (Retake images from poor seeing) (6:15-6:23)

06:18 UT seeing ~1” or better now.

N3627 (6:23-7:10)

Priority3 target
06:23 UT Preset for copointing. Collimation looks good. Selected this target because of minimal slew times. Collimation looks good so we will not bother with dofpia.

Radial star offsets from rotator centers: BLUE 5.8" and RED 8.4"

lbcrangebal:

```
---------------------------------------------------------------------
COPOINTING: B=62425 R=62425
Pointing updates: delta_IE = 7.87", delta_CA = -3.73"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
            SX:    0.02    -0.15    -3.12    -0.46
            DX:   -0.01    -0.02    -0.48     0.20
---------------------------------------------------------------------
```

06:29 UT Starting science.

07:02 UT Seeing improving, subarcsecond on images now and reporting 1” on the DIMM.

Technical downtime: DX Primary MIrror Panic (7:10-7:33)

07:10 UT Sending preset for copointing and collimation to N42114. The blue looks like it could use a touch of focus. Seeing is sub arcsecond now, There are some thin clouds visible on teh southern horizon

07:13 UT The right primary mirror has panicked. Stopped TMS while David recovers.

N4214 (7:33-7:58)

Priority2 target
07:33 UT David has recovered the DX primary. Resending preset to N4214 doe copointing and collimation. TMS has been restarted.

Radial star offsets from rotator centers: BLUE 9.5" and RED 15.7"

lbcrangebal:

```
------------------------------------------------------------------------
COPOINTING: B=74128 R=74124
Pointing updates: delta_IE = 11.79", delta_CA = -3.15"
  Mirror updates:   dX(mm)   dY(mm)   dRX(")   dRY(")
            SX:    0.07    -0.11    -2.38    -1.51
            DX:    0.02     0.17     3.72    -0.48
------------------------------------------------------------------------
```

07:45 UT Science finally. Subarcsecond seeing, clear skies.

0755 UT Seeing was variable, but images appeared 1-1.3”.

N4395 (7:58-8:16)

Priority2 target

07:58 UTSending copointing script for N4395. Collimation looks ok

08:01 UT Starting science. Seeing 0.95” on the DIMM

08:09 UT Seeing variable, bouncing between 1-1.8” on the DIMM, but 1.15” for the most part. The first image 1.2-1.4”

N4258 (8:16-9:14)

Priority2 target
08:16 UT Sending preset for copointing and collimation. Blue focus looks soft so running dofpia. Our temps have dropped quite a bit so guess its not surprising we are chasing focus a bit.

08:36 UT Seeing continues to be variable but better, 0.8-1.25”. Conditions clear.

08:46 UT Images IQ 1.2” or better.

08:58 UT Image slightly elongated:
----- receiving 'lbcb.20250226.084907.fits' [frame 1] (5.0s/249.2s)
object:N4258 | filter:SDT_Uspec | exptime:200.26 | pa_pnt:-34.67 | dithoffx:0 | dithoffy:0

09:12 UT Blue collimation soft, red needs tuning too. About to read out so we will recollimate on next target

N4736 (9:14-9:44)

Priority2 target
09:14 UT Preset to target for collimation. Lots of focus and spherical on blue.

Radial star offsets from rotator centers: BLUE 5.8" and RED 8.4"

lbcrangebal:

COPOINTING: B=92143 R=92139
Pointing updates: delta_IE = 3.66", delta_CA = -6.64"

Mirror updates:	dX(mm)	dY(mm)	dRX(")	dRY(")
SX:	0.04	-0.15	-3.20	-0.85
DX:	0.12	0.17	3.66	-2.57

09:24 UT Starting science.

09:39 UT Blue is out of focus now. I can't believe I'm saying it, but we need to recollimate. I'm not sure the IQ on the blue side meets the criteria to mark this as completed.

N5194 (9:44-10:38)

09:44 UT Preset for collimation.

09:56 UT Starting science. Conditions remain clear. Seeing is 1.2" on the DIMM, 1.1-1.3" on the guiders.

10:15 UT IQ 1-1.2" on the images

Seeing/Reconfig (10:38-11:11)

10:38 UT Preset to N5474 but target not complted. Collimation was holding and source very nearby, so jumped right to science. DIMM is reporting up to 1.4".

10:46 UT Seeing just blew up to 2.08" on the DIMM. Back down to 1.5, but appears to be deteriorating, and more variable. I think its worth abandoning lbc's for now.

10:48 UT Seeing is 1.5" on the last image and I'm concerned this is trending in a bad direction.. Switching to MODS for the last 2 hours of the night. There are programs that have more flexible constraints.

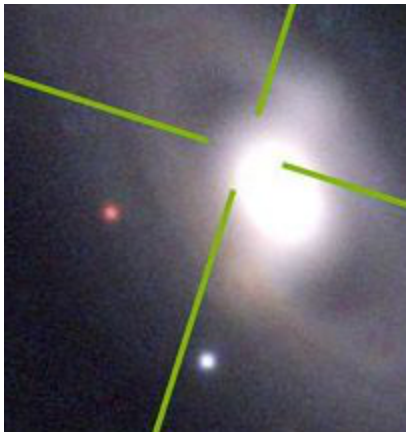
11:04 UT Configured for MODS and David is pointing and collimating. David got a copointing error when sending collimation. For expediency, we decided to collimate on target.

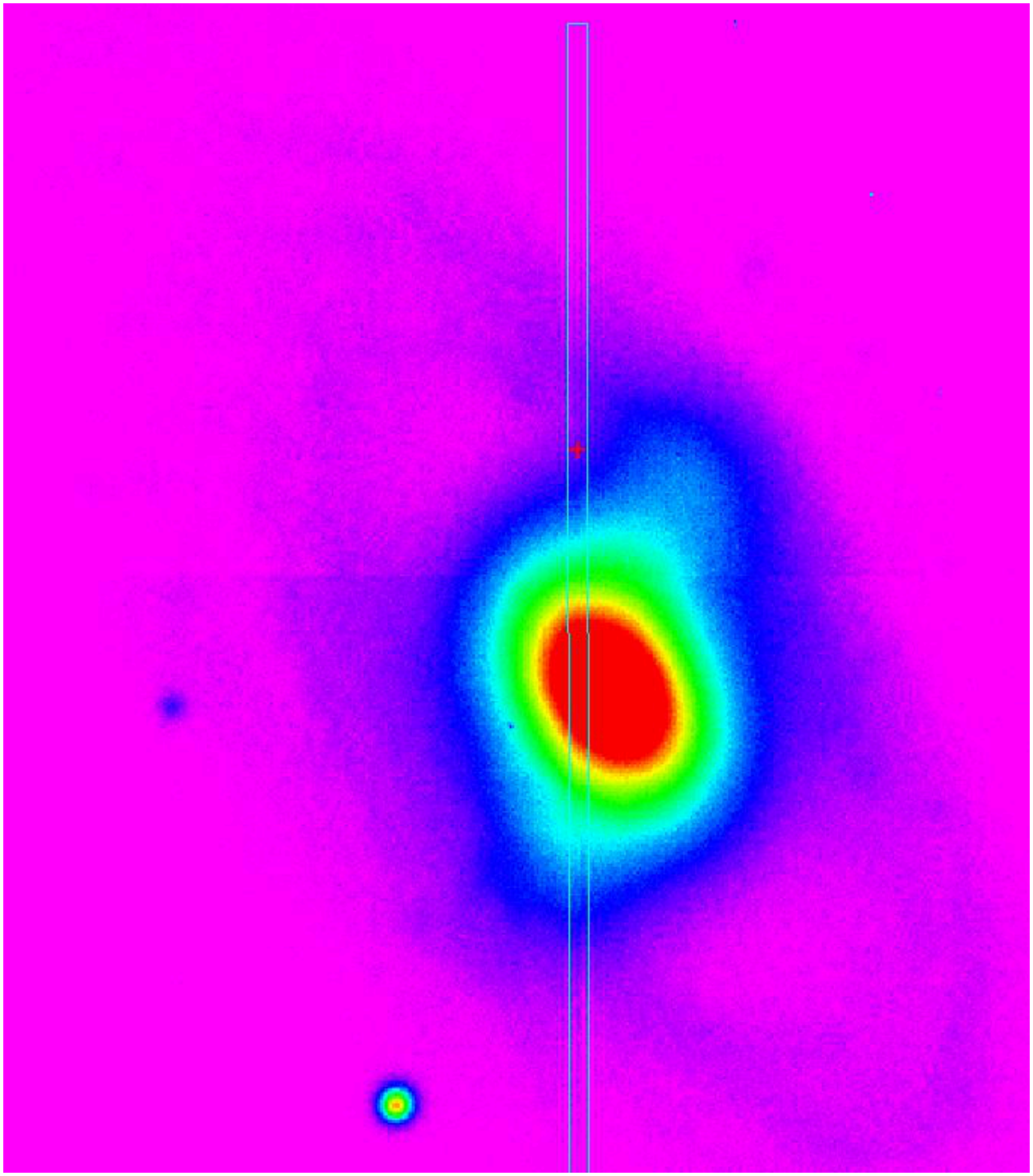
OSU_SCAT

2024igg (Not completed, target not identified)

11:11 UTPreset to 2024igg_UT1100.acq, seeing 1.2-1.3" on the guiders. This uses a blue acquire and the slit image was 90s, could easily have been shortened for the future.

OSU_lm11:26 UT Although the source was noted to be seen just yesterday, I see absolutely nothing today. I would suggest a blind offset for alignment.





OSU_lmcsats

NGC5585_dw11 (Not completed - script issue)

11:31 UT Sending preset for NGC5585_dw11.acq. Unfortunately we might run our of time to complete because of time spent on previous acquisition… but we will do what we can

11:33 UT The script includes a slit that we do not have:
M1> mselect ls5x60x2.5
** ERROR: slitmask Unknown position ID 'ls5x60x2.5', must be one of [DarkMask,SieveMask,Imaging,LS5x60x0.3,LS5x60x0.6,LS5x60x0.8,LS5x60x1.0,LS5x60x1.2,LS60x5,PinholeSlit,PointingMask,LS5x60x2.4,PointingMask108,Empty,ID531713,ID594644,ID532732,ID515404,Empty,ID585146,ID554456,ID555234,ID560129,ID560557]
** Abort, Retry, or Ignore? >

IC4182_dw13.acq: SLITMASK LS5x60x2.5
NGC3738_dw10.acq: SLITMASK LS5x60x2.5
NGC3738_dw7.acq: SLITMASK LS5x60x2.5
NGC4236_dw13.acq: SLITMASK LS5x60x2.5
NGC4861_dw5.acq: SLITMASK LS5x60x2.5
NGC5204_dw3.acq: SLITMASK LS5x60x2.5
NGC5585_dw11.acq: SLITMASK LS5x60x2.5
NGC6503_dw6.acq: SLITMASK LS5x60x2.5
UGC4115_dw1.acq: SLITMASK LS5x60x2.5
UGC4115_dw2.acq: SLITMASK LS5x60x2.5
UGC4426_dw1.acq: SLITMASK LS5x60x2.5

I do not feel comfortable editing PI scripts in the middle of the night without verifying if they desire the 2.4” or a custom mask that was not yet inserted.

[queue manager note: it is definitely the 2.4 mask requested and a typo in the scripts.
Fixed in place, see share/OBs/OSU_lbcsats/fixit, executed with csh < fixit]]

OSU_SCAT

Technical issue, guide jump during acquisition (11:40-11:48)

11:40 UT Sending preset to acqBinoMODS 2024iss_UT1200.acq

2024iss (11:48-12:39)

11:48 UT Guide jump on mods1 as we were taking acquisition images. David bumping back into FoV. Taking another acquisition image, mods1r.20250226.0004 is likely no good.

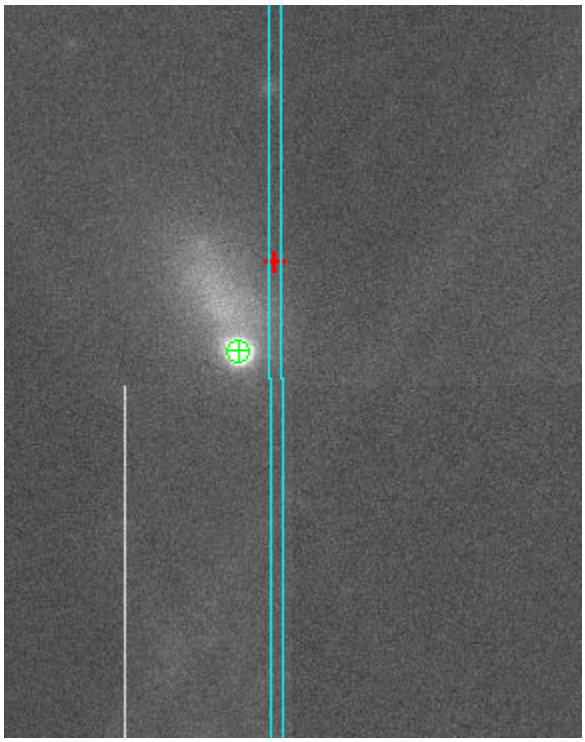
MODS1:
Computed Slit Alignment Offset:

dX = -1.048 arcsec
dY = 9.516 arcsec

MODS1 Offset Command:
offsetxy -1.048 9.516 rel

MODS2:
Computed Slit Alignment Offset:
dX = 2.898 arcsec
dY = 6.918 arcsec

MODS2 Offset Command:
offsetxy 2.898 6.918 rel



11:58 UT Starting science. DIMM seeing up to 2.2, but guider reporting 1..3". Conditions clear

12:09 UT Seeing 1.4-1.5" on the guider now. This program asks for 1.5" seeing so we are just within spec.

12:16 UT Seeing is variable, bouncing between 1.2" and 1.6" on the guider, 1.3" average.

SpecPhot - GD153 (12:39-12:57)

12:39 UT Sending preset to GD153 Spectrophotometric standard
MODS1:

Computed Slit Alignment Offset:
  dX = -1.238 arcsec
  dY = 12.446 arcsec

MODS1 Offset Command:
  offsetxy -1.238 12.446 rel

MODS2:
Computed Slit Alignment Offset:
  dX = 2.944 arcsec
  dY = 8.733 arcsec

MODS2 Offset Command:
  offsetxy 2.944 8.733 rel
Additional:
Computed Slit Alignment Offset:
  dX = 0.470 arcsec
  dY = -0.475 arcsec

MODS2 Offset Command:
  offsetxy 0.470 -0.475 rel

12:46 UT Starting science. Seeing 1.15-1.35” on the guiders.

12:57 12 degree morning twilight

13:02 UT Closing up.

13:45 Sunrise

Calibrations

LBC 25xbias

I was going to take some MODS calibrations but noted that in the past few minutes:
[2025-02-26T12:55:44] MODS2 Red CCD dewar pressure of 1.20E-03 torr exceeds 0.001 torr
[2025-02-26T13:01:44] MODS2 Red CCD dewar pressure of 1.17E-03 torr exceeds 0.001 torr
[2025-02-26T13:07:44] MODS2 Red CCD dewar pressure of 1.15E-03 torr exceeds 0.001 torr
[2025-02-26T13:13:44] MODS2 Red CCD dewar pressure of 1.14E-03 torr exceeds 0.001 torr

The temperature appears stable but this stable climb is likely a sign that things are going to warm soon. I will monitor while I take LBC Biases.