LBT Observing Log: 2025 10 19 UT

Observers: Justin Rupert, Jon Rees. Juan Carlos Guerra (AO)
Partner Observer: Mark Whittle, Yifan Zhou
Telescope Operator: Josh Williams

Plan:

Seeing anticipated (ALTA) to be modest/poor for the first ⅔ of the night.
Start with UM_SWAN PEPSI observation of Comet SWAN.
Continue with PEPSI targets.

2MJ1821+5030 OSU_BHB (done)
TIC8927 UVA_Multistar (done)
TIC3227 UVa_Multistar (done)
TIC4707 UVa_Multistar (done)
2MJ2051+0049 OSU_BHB (done)
2M2150-0718 OSU_MWA (solar, high alpha, done)
2M2121+0105 OSU_MWA (solar, high alpha, done)
2M0020+0111 OSU_MWA (solar, high alpha, done)
2M0029+1352 OSU_MWA (solar, low alpha, done)
2M0038+1742 OSU_MWA (solar, high alpha, done)
2M0044+1556 OSU_MWA (solar, high alpha, done)
2M0051+0401 OSU_MWA (solar, low-alpha, done)
2M0105 OSU_MWA (done)
2M0109 OSU_MWA (done)
2M0118 OSU_MWA (done)

Switch to LUCI
UVA Disk-Jz (done)

Switch to PEPSI
Gaia555 + HIP10054 OSU MPMDwarf (done)
Gaia497 + HIP24732 OSU MPMDwarf (done)
~~2M0501 OSU MWA~~
2M0351 OSU MWA (done)
~~2M0331 OSU MWA~~

Switch to LBC (to finish out the night, and get twilight flats)
ND_J0053 (done, but seeing worsened – check whether acceptable).
~~N628 OSU_Monitor~~
~~N627~~
~~N925~~

~~N2403~~

Back to Pepsi
OSU_MWAbundDisp
2M0331 (done)

2M0804 (done)
2M0812 (done)
2M0815 (done)
2M0826 (done)
2M0903 (done)
2M0933 (done)
2M0955 (done)

OSU_BHBinaries
2MJ0602-1602 (done)
2MJ0623-1357 (done)
~~2JM0630-1345~~

OSU_MWAbundDisp
2M0501 (done)

Summary:

- 2M2121+0105 (03:54-04:04)
- 2M0020+0111 (04:04-04:14)
- 2M0029+1352 (04:14-04:23)
- 2M0038+1742 (04:23-04:32)
- 2M0044+1556 (04:32-04:37)
- 2M0051+0401 (04:37-04:43)
- 2M0105 (04:43-04:49)
- 2M0109 (04:49-04:54)
- 2M0118 (04:54-04:59)

UVa
- Disk
  - Reconfig/setup (05:01-05:29)
  - IRAS 23077+6707 (05:29-

OSU
- MPMdwarf
  - Gaia555 (08:11-08:32)
  - HIP10054 (08:32-08:37)
  - HIP24732 (08:37-08:40)
  - Gaia497 (08:40-08:51)
- MWAbund
  - 2M0351 (08:53-09:04)

Reconfig (09:04-09:25)

ND
- J0053 (09:25-10:34)

Reconfig (10:34-11:10)

OSU
- MWAbund
  - 2M0331 (11:10-11:16)
  - 2M0804 (11:16-11:24)
  - 2M0812 (11:24-11:28)
  - 2M0815(11:28-11:37)
  - 2M0826+27 (11:37-11:43)
  - 2M0903 (11:43-11:47)
  - 2M0933(11:47-11:54)
  - 2M0955(11:54-12:00)
- BHBin
  - 2MJ0602 (Gaia DR3 29913) (12:00-12:14)
  - 2MJ0623-1357 (Gaia DR3 2999450) (12:14-12:28)
- MWAbund
  - 2M0501 (12:28-12:35)

ALTA predicts poor seeing so opt for PEPSI. Tried UM_SWAN but difficulty identifying target which was exacerbated by patchy clouds. Failed. Low S/N data acquired with weak NaD lines in emission, so confirms we had the comet on one side. Try again tomorrow? Proceeded with PEPSI targets, favoring bright. Programs: UVa_Multistar and OSU_MWAbundDisp. Seeing improved enough to try AO on UVa_Disk which was successful. Not enough LBC targets to take us to the end of the night, so opted for quick switch to PEPSI and completed some longer OSU_mpmdwarf targets. Seeing remained good and stable, so switched to LBC. Unfortunately, the seeing worsened, so we only did ND_j0053 which got close/above the seeing threshold for that program. Seeing was too poor to be useful to OSU_MONITOR, so decided to revert to PEPSI to finish the night. Completed more OSU_MWAbundDisp and some OSU_BHBinaries into 12-degree. Unluckily, the seeing improved for these – we probably could have stayed with LBC…

AO log: AO Nightlog UT20251019

PEPSI Log:
https://drive.google.com/file/d/1NQflF2gwqIxVdb1h3L45ccZMGEvgkX0E/view?usp=sharing

Issues:

It seems the link to the “Current” LBC Plot is stuck on UT 20250929. The webpage of the directory of LBC plots says under the “Last Modified” column that it is up to date. Clicking the link to the png from tonight (UT 20251019) loads the correct png.

We had to cycle the center NUC in the remote room twice because it froze.

SX M1 mirror panic.

IT 9418: GCS hang during preset.

Weather:

Some early patchy clouds which undermined the first target (Comet). Seeing was tricky during the night. Started poor; improved to achieve AO LUCI program, tried LBC but at that time the seeing worsened so we returned to PEPSI, after which the seeing improved. We made the correct/logical decisions at the time, but were thwarted by the changing seeing.

Temperature at ground *

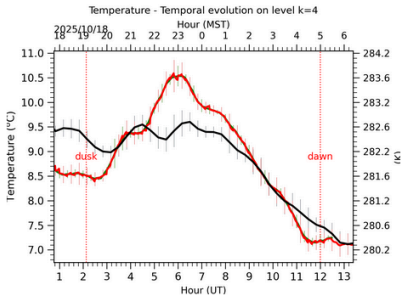


Fig. 4: Absolute temperature temporal evolution between the sunset and the sunrise at [38-62]m.

Wind Speed at ground *

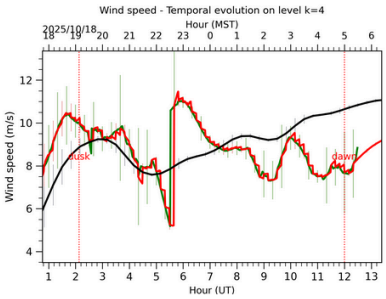


Fig. 5: Wind speed temporal evolution between the sunset and the sunrise at [38-62]m.

Wind Direction at ground *

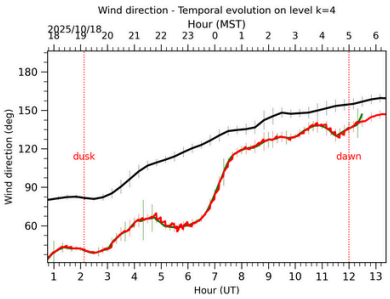
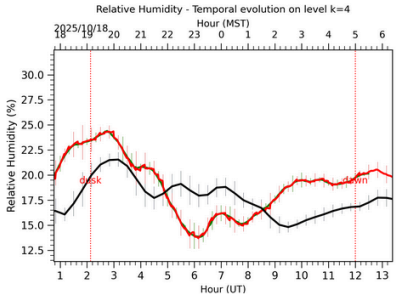
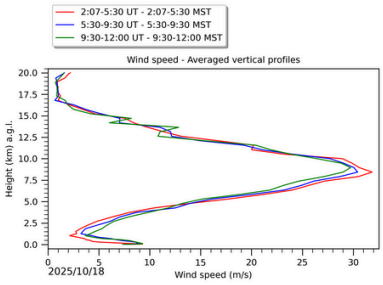


Fig. 6: Wind direction temporal evolution between the sunset and the sunrise at [38-62]m.

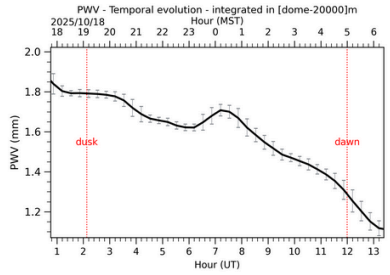
Relative Humidity at ground *

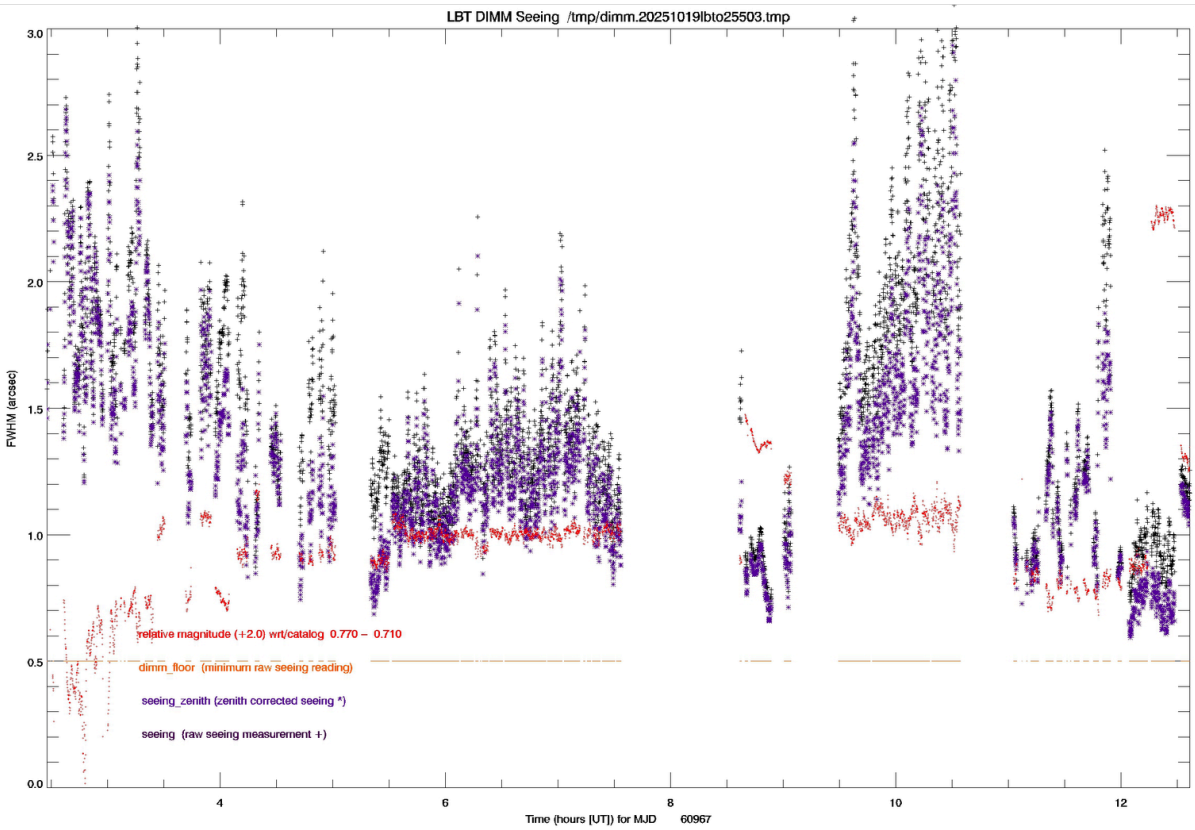


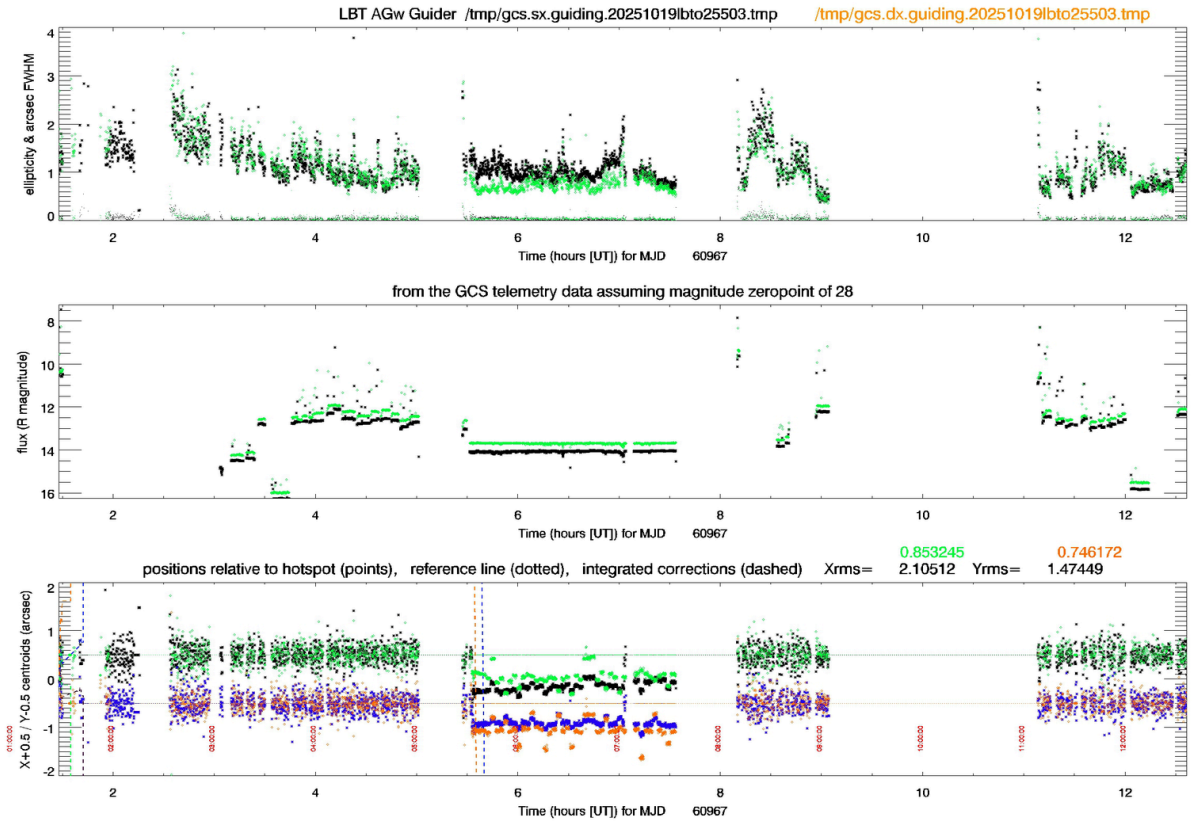
Wind Speed vertical profiles

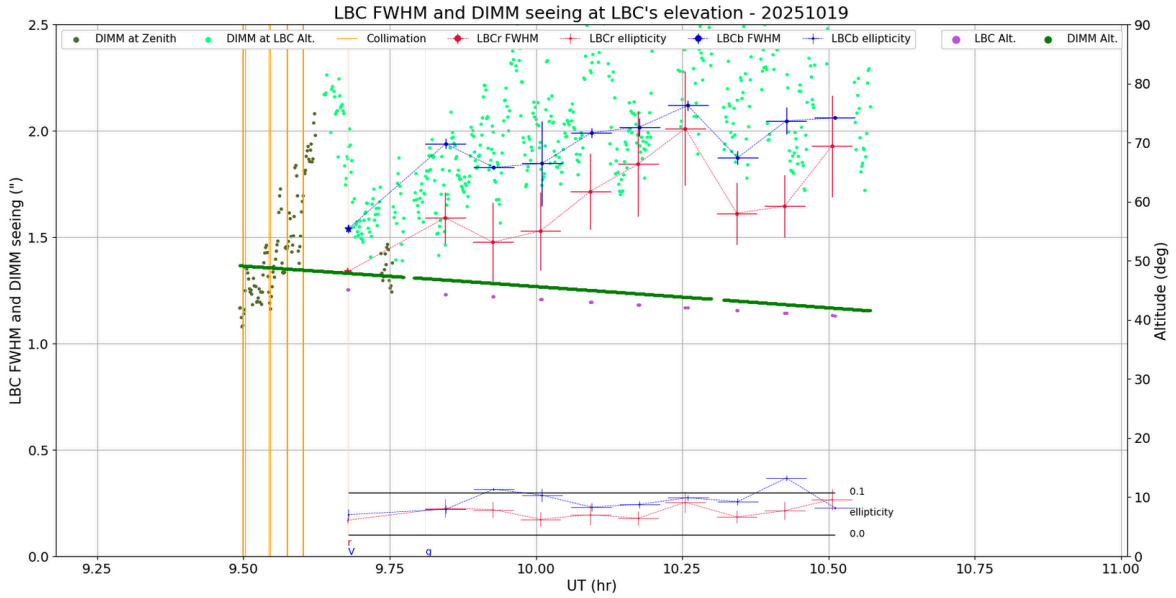


Precipitable Water Vapor




LBT DIMM Seeing /tmp/dimm.20251019lbto25503.tmp
FWHM (arcsec)
relative magnitude (+2.0) wrt/catalog 0.770 – 0.710
dimm_floor (minimum raw seeing reading)
seeing_zenith (zenith corrected seeing *)
seeing (raw seeing measurement +)
Time (hours [UT]) for MJD 60967


LBT AGw Guider /tmp/gcs.sx.guiding.20251019lbto25503.tmp /tmp/gcs.dx.guiding.20251019lbto25503.tmp
ellipticity & arcsec FWHM
Time (hours [UT]) for MJD 60967
from the GCS telemetry data assuming magnitude zeropoint of 28
flux (R magnitude)
Time (hours [UT]) for MJD 60967
0.853245 0.746172
positions relative to hotspot (points), reference line (dotted), integrated corrections (dashed) Xrms= 2.10512 Yrms= 1.47449
X+0.5 / Y-0.5 centroids (arcsec)
Time (hours [UT]) for MJD 60967



Overview (times are given in UT):

00:20 UT LUCI Init

00:37 UT Opening shutters

00:47 UT Sunset

01:08 UT Pointing check. - bright M5 star

01:20 UT Pointing check - dimmer M7.3 star

01:27 UT Collimation

UM

SWAN

C/2025 R2 (01:32-02:31)

01:32 UT Preset sent

01:36 UT 12 deg twilight

01:39 UT Pointing check - object not found

01:42 UT Nothing on DX. Resending preset.

01:45 UT Looks like clouds may be stymying us. Sending via NSI gui to see if there's any difference.

01:48 UT Still nothing on the guiders. Another pointing check.

01:50 UT Confirmed that clouds are present. Prevented us acquiring a similar mag star.

01:52 UT Caught it on DX, nothing on SX. One more pointing check.

01:54 UT Preset, back to science target.

01:59 UT DX grabbed what looks like the wrong object. Resending DX preset.

02:05 UT Integrating, object is on SX but nothing on DX.

02:12 UT Clouds closing in, losing object on SX now.

02:14 UT Object decidedly lost on SX. Ending exposure. Pointing check, we'll see if we can reacquire on both sides now.

02:18 UT Preset back to science target

02:23 UT Still nothing on either guider. Pointing into clouds:

02:30 UT Clouds in this region are bad enough to prevent us acquiring this object, it's setting soon. Moving to a different program, more promising area of the sky. Try again tomorrow.

OSU

BHBin

2MJJ1821+5030 (02:31-02:57)

02:31 UT Preset sent

02:37 UT Clouds closed in while waiting for WFS. Starting to lose object on guiders.

02:39 UT Exposure started. FWHM SX:2.2" DX 2.1" DIMM 2.0".

02:47 UT SNR CD3:37 CD5:41

02:49 UT Running another exposure. Target SNR is 50, so this should at least get us more signal.

02:57 UT SNR CD3:34 CD5:41

UVa

MultiStar

TIC8927 (02:57-03:17)

02:57 UT Preset sent. This part of the sky looks clear

03:01 UT Preset hung, DX initializing guide thread, SX moving probe.

03:01 UT Josh is restarting both GCS subsytems.

03:02 UT Preset sent.

03:04 UT Missed it on DX, pointing check.

03:09 UT Preset resent.

03:12 UT Exposure started. FWHM SX: 1.6" DX:1.6". DIMM 1.84".

03:16 UT SNR CD3:109 CD6:116 (aiming for 100).

TIC3227 (03:17-03:24)

03:17 UT Preset sent

03:19 UT Exposure started. FWHM SX: 1.4” DX 1.5”. DIMM 1.87”

03:23 UT SNR CD3:94 CD6: 107

TIC4707 (03:24-03:30)

03:24 UT Preset sent

03:26 UT Exposure started. FWHM SX: 1.4” DX: 1.3”. DIMM 1.81”

03:28 UT SNR CD3:121 CD6:138

OSU

BHBin

2MJ2051+0049 (Gaia DR3 42284657) (03:30-03:44)

03:30 UT Preset sent

03:34 UT Exposure started. FWHM SX: 1.1, DX 1.3”

03:39 UT Clouds have cleared out. Sky looks good now. RH 21%. Wind ~11 m/s

03:42 UT SNR CD3:56 CD5:95. Aiming for 50.

OSU

MWAbund

2M2150-0718 (03:44-03:54)

03:44 UT Preset sent

03:47 UT Exposure started. FWHM SX: 1.1” DX: 1.2”. DIMM 1.33”

03:53 UT SNR CD2: 192 CD4: 361

2M2121+0105 (03:54-04:04)

03:54 UT Preset sent

03:57 UT Exposure started. FWHM SX: 1.2” DX: 1.4”. DIMM 1.16”

04:04 UT SNR CD2:201 CD4:351

2M0020+0111 (04:04-04:14)

04:04 UT Preset sent

04:08 UT Exposure started. FWHM SX:1.1, DX: 1.2, DIMM:1.2” Cyclope: 1.6”

04:13 UT SNR CD2: 247 CD6:462

2M0029+1352 (04:14-04:23)

04:14 UT Preset sent

04:16 UT Exposure started FWHM SX:0.9” DX 0.9”, DIMM 0.95”

04:23 UT SNR CD2:240 CD4:445

2M0038+1742 (04:23-04:32)

04:23 UT Preset sent

04:25 UT Exposure started. FWHM SX:0.92” DX:0.94” DIMM 1.32”.

04:31 UT SNR CD2:208 CD4:366

2M0044+1556 (04:32-04:37)

04:32 UT Preset sent

04:33 UT Exposure started. FWHM SX: 0.82”, DX: 0.81”.

04:34 UT Exposure cut from 5:00 to 2:30 since our SNR is much higher than required.

04:37 UT SNR CD2:158 CD4:288

2M0051+0401 (04:37-04:43)

04:37 UT Preset sent

04:40 UT Exposure started. FWHM SX:0.9” DX:0.97”. Exptime 2:30.

04:41 UT FWHM SX: 0.75” DX:0.79”

04:43 UT SNR CD2:174 CD4:316

2M0105 (04:43-04:49)

04:43 UT Preset sent

04:45 UT Exposure started. FWHM SX:0.7” DX:0.77” DIMM 0.9”” Exptime 2:30

04:48 UT SNR CD2:157 CD4:274

2M0109 (04:49-04:54)

04:49 UT Preset sent

04:51 UT Exposure started. FWHM SX:1.1” DX:1.1”. DIMM 1.13”

04:54 UT SNR CD2:128 CD4:218

2M0118 (04:54-04:59)

04:55 UT Preset sent

04:56 UT Exposure started. FWHM SX:1.0” DX:1.1”

04:57 UT FWHM SX: 0.96” DX:1.0. DIMM 1.06”

04:59 UT SNR CD2:135 CD4:247

UVa

Disk

Reconfig/setup (05:01-05:29)

05:01 UT **Reconfig BinoLUCI**

05:02 UT SX mirror panic.

05:07 UT LUCI Fieldstop alignment. Fieldstop into FPU

05:11 UT Taking alignment exposure

05:14 UT LUCI2 alignment adjusted, another exposure

05:15 UT Fieldstop alignment complete. Reconfig complete.

05:16 UT Pointing preset.

05:25 UT Collimation preset

IRAS 23077+6707 (05:29-

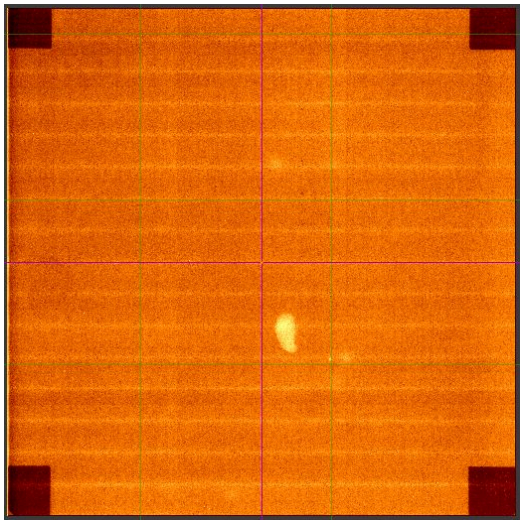
05:29 UT LUCI preset sent.

05:33 UT Seeing ~1.3” on AO. 1.11” DIMM. Optimising AO.

05:39 UT Exposures started. LUCI1 0002, LUCI2 0003. DIMM 1.13”.

05:44 UT FWHM 0.25” z, 0.14” J. Loop is running slower on SX, so correction is a little worse.

Interesting persistence feature on LUCI1:



05:50 UT IQ Check: 12.04x14.54 pix (~0.2”) on LUCI1 (z-band), 9.94x7.32 pix (0.1”) on LUCI2 (J band)

05:57 UT IQ: 18.64x17.63 (0.3”) LUCI1 (z) 10.65x9.11 (0.2”) LUCI2 (J).

06:05 UT 15.5x13.36 LUCI1, 7.13x8.49 LUCI2

06:12 UT 15.4x14.2 LUCI1, 10.45x9.1 LUCI2. DIMM 1.46

06:20 UT 18.41x17.47 LUCI1 11.85x8.03 LUCI2 DIMM 1.04”

06:28 UT 15.1x18.17 LUCI1 12.44x9.68 LUCI2 DIMM 1.28”

06:36 UT 16.25x14.46 LUCI1 9.98x8.39 LUCI2. DIMM 1.25”

06:40 UT AO loop opened on right side. Script paused (luci1.20251019.0025, luci2.20251019.0026).

06:43 UT AO loop recovered. Retaking previous exposure.

06:48 UT 17.27x16.41 LUCI1 8.3x8.62 LUCI2. DIMM 1.29”

06:56 UT 12.46x9.26 LUCI1 10.99x8.99 LUCI2 DIMM 1.08”

07:05 UT SX offset failed. Restarted script from this step

07:10 UT AO loop closed, script resumed.

07:17 UT IQ 13.93x14.84 LUCI1, 12.29x11.04 LUCI2. DIMM 1.32”

07:26 UT 14.15x11.81 LUCI1, 11.6x8.23 LUCI2 DIMM 1.32”

LUCI1 FWHM (z)	LUCI2 FWHM (J)
0.25”	0.14”
0.2”	0.1”
0.3”	0.2”
0.2”	0.12”
0.23”	0.15”
0.28”	0.15”
0.25”	0.17”
0.23”	0.14”
0.25”	0.13”
0.17”	0.15”
0.22”	0.18”
0.20”	0.15”

07:35 **Reconfig BinoPepsi**

OSU

MPMdwarf

Gaia555 (08:11-08:32)

07:45 UT Operator display froze. Power cycling tower

08:01 UT Up and running again. Pointing preset sent. M2.5 star

08:09 UT Collimation preset

08:11 UT Science preset sent

08:14 UT Starting exposure. FWHM SX: 0.95”, DX: 1.0”. DIMM 1.32”

08:31 UT SNR CD6:38 (not visible CD3)

HIP10054 (08:32-08:37)

08:32 UT Preset sent

08:34 UT Starting exposure. FWHM SX: 1.5” DX: 1.5”.

08:35 UT Middle NUC (Facsum) froze again

08:36 UT SNR CD3:361 CD6: 367

HIP24732 (08:37-08:40)

08:37 UT Preset sent

08:39 UT Starting exposure. FWHM SX:1.0” DX:1.0”

08:30 UT SNR CD3:463 CD6:416

Gaia497 (08:40-08:51)

08:40 UT Preset sent

08:42 UT Exposure started. FWHM SX: 1.0 DX: 1.0. DIMM 0.89”.

08:51 UT SNR CD6:35

MWAbund

08:51 UT 2M0501 not in Obs program, but in Readme. Skipping to next target, we’ll come back

2M0351 (08:53-09:04)

08:53 UT Preset sent

08:57 UT Exposure started, FWHM SX:1.0” DX:0.93” DIMM:

09:04 UT SNR CD2:259 CD4:469

Seeing looks good and dropping, ALTA predicts will remain low – time to go to LBC

Reconfig (09:04-09:25)

09:04 UT **Reconfig LBC**

09:05 UT LBCs powered on

09:07 UT Restarting the MultiLine computer (license issue).

09:12 UT Running PEPSI Cals.

09:15 UT TMS lasers on

ND

J0053 (09:25-10:34)

09:25 UT Co-pointing preset sent

09:29 UT dohybrid

09:40 UT co-pointing

09:46 UT Science preset sent

09:47 UT Exposures started

09:53 UT IQ FWHM 1.83” blue, 1.50” Red. DIMM 1.63”

Unlucky with seeing – seems to be increasing, now close to threshold for this program.

10:02 UT FWHM 1.76” blue, 1.4” red. DIMM 1.5”

10:11 UT FWHM 2.0” blue, 1.65” red, 2.15” DIMM

10:20 UT FWHM 2.3” blue, 2.0” red, 1.92” DIMM

10:30 UT FWHM 2.1” blue, 1.7” red, DIMM 2.3”

10:33 UT exposures completed. 2.4” blue, 2.0” red

Decided this won't yield useful data for OSU_MONITOR, so return to PEPSI for bright MWAbund stars to finish out the night.

Reconfig (10:34-11:10)

10:34 UT **Reconfig BinoPepsi**. Seeing is too bad for the Monitor program, so back to Pepsi.

OSU

MWAbund

2M0331 (11:10-11:16)

10:59 UT Pointing preset - M3.9 star

11:04 UT second pointing preset - reasonable brightness.

11:07 UT Collimation preset

11:10 UT Preset sent

11:11 UT Exposure started, FWHM SX:1.2" DX:1.3" DIMM: 0.84" Seeing improved again – unlucky decision to leave LBC.

11:16 UT SNR CD2:134 CD4:241

2M0804 (11:16-11:24)

11:16 UT Preset sent

11:20 UT Exposure started. FWHM SX:0.75 DX:0.85. DIMM 1.41"

11:24 UT SNR CD2:116, CD4:235

2M0812 (11:24-11:28)

11:24 UT Preset sent

11:25 UT Exposures started. FWHM SX 0.89", DX: 0.97". DIMM 1.1"

11:28 UT SNR CD2:111 CD4:210

2M0815(11:28-11:37)

11:28 UT Preset sent

11:30 UT DX missed the target. Pointing check.

11:33 UT Preset resent

11:34 UT Exposure started. FWHM SX:0.80” DX: 0.82“ Dimm: 1.15“

11:37 UT SNR CD2:131 CD4:235

2M0826+27 (11:37-11:43)

11:37 UT Preset sent

11:39 UT Exposure started. FWHM SX: 0.81“ DX: 0.86“ Dimm: 1.21“

11:42 UT SNR CD2:115 CD4:207

2M0903 (11:43-11:47)

11:43 UT Preset sent

11:44 UT Exposure started. FWHM SX: 0.82“ DX: 0.99“ Dimm: 0.95“

11:47 UT SNR CD2:105 CD4:193

2M0933(11:47-11:54)

11:47 UT Preset sent

11:50 UT Exposure started. FWHM SX: 1.4“ DX:1.4 “ Dimm: 1.65“

11:54 UT SNR CD2:116 CD4:201

2M0955(11:54-12:00)

11:54 UT Preset set

11:56 UT Exposure started. FWHM SX: 1.2“ DX: 1.2“

11:59 UT SNR CD2:124 CD4:220

BHBin

2MJ0602 (Gaia DR3 29913) (12:00-12:14)

12:00 UT Preset sent

12:04 UT Exposure started. FWHM SX:1.1 “ DX: 1.0“ Dimm: 0.65“

12:05 UT 18 deg twilight

12:13 UT SNR CD2:89 CD4:145

2MJ0623-1357 (Gaia DR3 2999450) (12:14-12:28)

12:14 UT Preset sent

12:17 UT Exposure started. FWHM SX:0.71 “ DX: 0.82“ Dimm: 0.77“

12:27 UT SNR CD2:56 CD4:66

MWAbund

2M0501 (12:28-12:35)

12:28 UT Preset sent

12:31 UT Exposure started. FWHM SX: 0.84“ DX: 0.83“ Dimm: 1.19“

12:33 UT 12 deg twilight

12:35 UT SNR CD2:170 CD4:354

12:36 UT Shutting things down

12:38 UT LUCI safed

12:50 Running LBC biases.

13:06 UT LBCs powered off.