LBT Observing Log: 2025 Dec 18 UT

Observers: Alex Becker
Partner Observer: Chick Woodward, Ilyia Ilyin (AIP- assisting)
Telescope Operator: Josh Williams

Plan: PEPSI all night

Titan (non-sideral) DONE – Total time target 0.8hrs
TOI 1518 time critical transient DONE - Total time on target 5.78hrs
ND Gaia-004736 (Beers) DONE - Total time on target 0.30hrs
ND Gaia-00512 (Fores) DONE - Total time on target 0.47hrs
ND Gaia-72640 (Beers) DONE - Total time on target 0.98hrs
C/2025 N1 (non-sidereal) MORE OR LESS COMPLETE - Total time on target 1.03hrs
ND Gaia-150784 (Beers) DONE - Total time on target 0.68hrs

Summary:

Night that was generally clear all night, with moderate seeing of the order 1.2-1.5 arcseconds. Occasional periods of poorer seeing. Try to observe a few more ND target to catch up on the time distribution allocations.

PEPSI log:
https://drive.google.com/file/d/1_xCFmF0GVsNLqej_dmd4BwZhSscYnMqb/view?usp=sharing

Issues:

Lost time (10 mins) to SX shell rip early in the night, and toward the end of the night lost about ~55 mins to some telescope TCS / PEPSI / guider / GCS / NSGUI crashes and communication failures, then right at the close of the night lost another 35+ mins to IIF / GCS handshake break down and preset failures, so lose the observing opportunity of last target as 12 degree limit (twilight) was reached before things could be set.

Weather:

At the start of night all sky cameras show clear skies at UTC 23:23.
(UTC 1:00) Wind 11 m/s @ 280, 5.2C, RH 36.6, Seeing 0.9”

Overview:

Ilya Ilyin joins to assist in non-sideral observations (try the PEPSI non-sideral interface first) and the OSU-PETS transit targets. Attempt to start very quickly at sunset to catch a solar system target. The 26deg elevation limit is set for tonight.

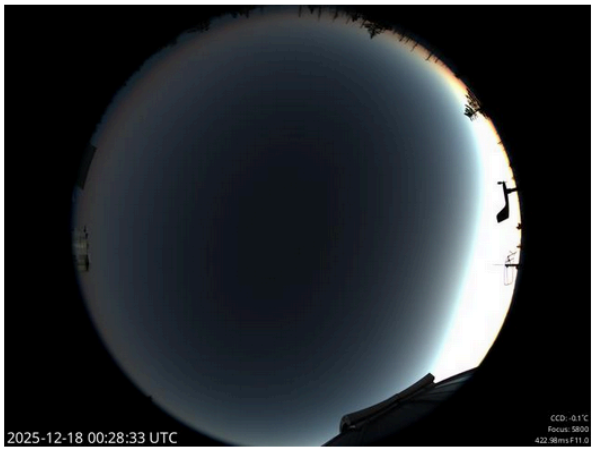
Observing

UTC 00:05 Run ThAR arcs for PEPSI at Zenith

UTC 00:13 Opening the shutters, T=5.2C RH 38.1% WindSpeed Front ~4-8 m/s

UTC 00:27 Running PEPSI flats as the sky darkens after sunset

Live view from the LBT enclosure roof



All-sky camera – Mt Graham

UTC 00:36 sending first preset to very bright star

UTC 00:38 opening Pepsi and re-send preset, spiral to bring it in (two steps and on Pepsi FOV)

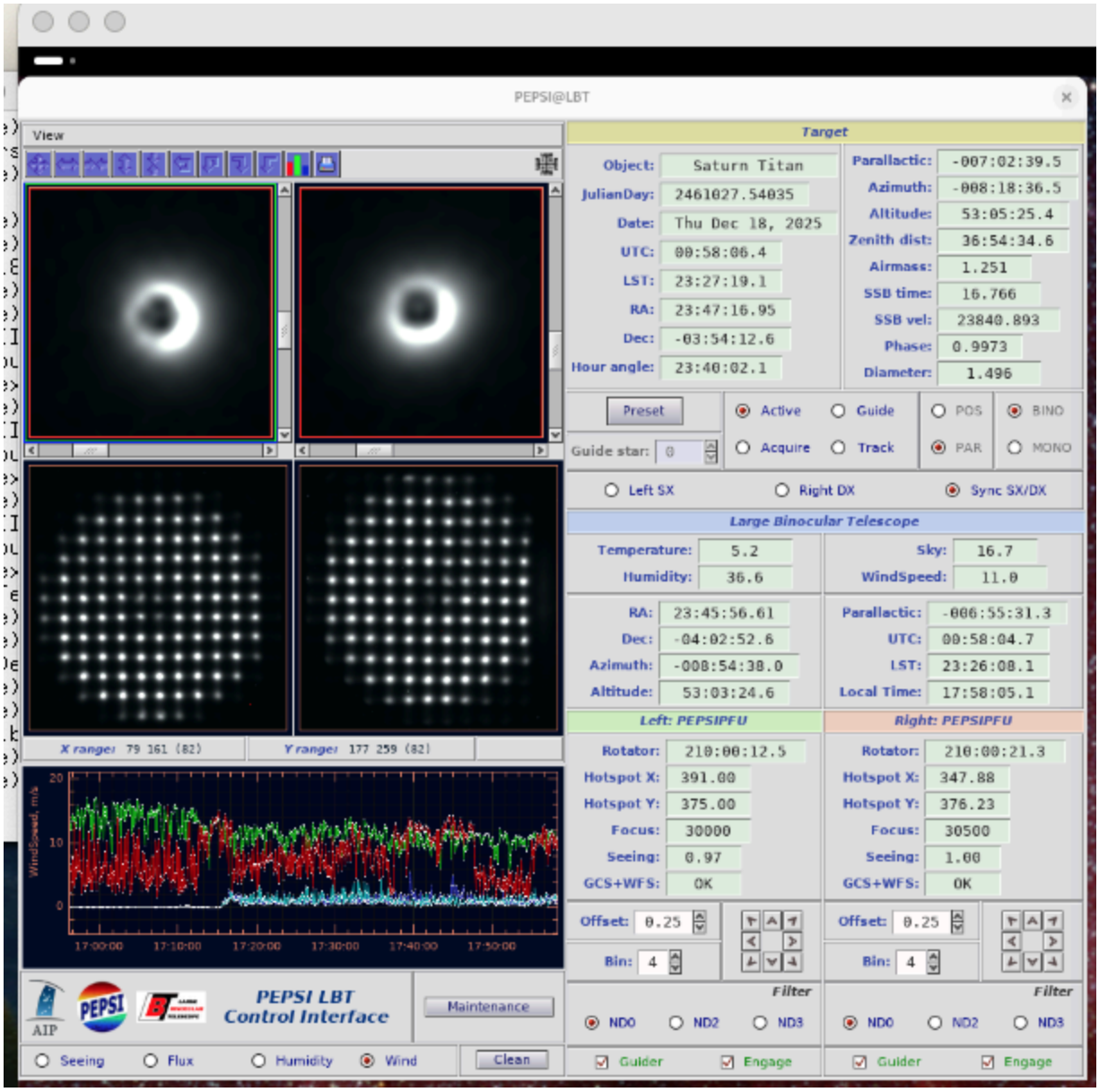
UTC 00:48 after initial acquire in SX/DX, set to fainter star for pointing and collimation

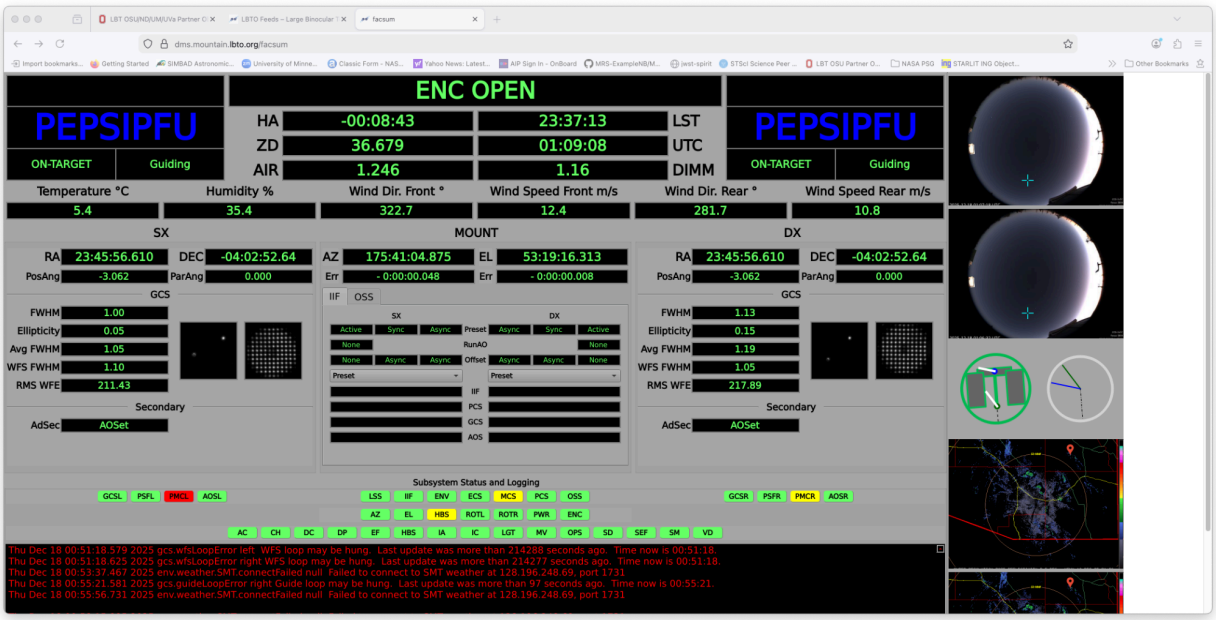
UTC 00:52 looks like the seeing under 1.0 arcsec at the moment

UM_Titan

UTC 00:54 preset to first target Saturn/Titan, and we got it.

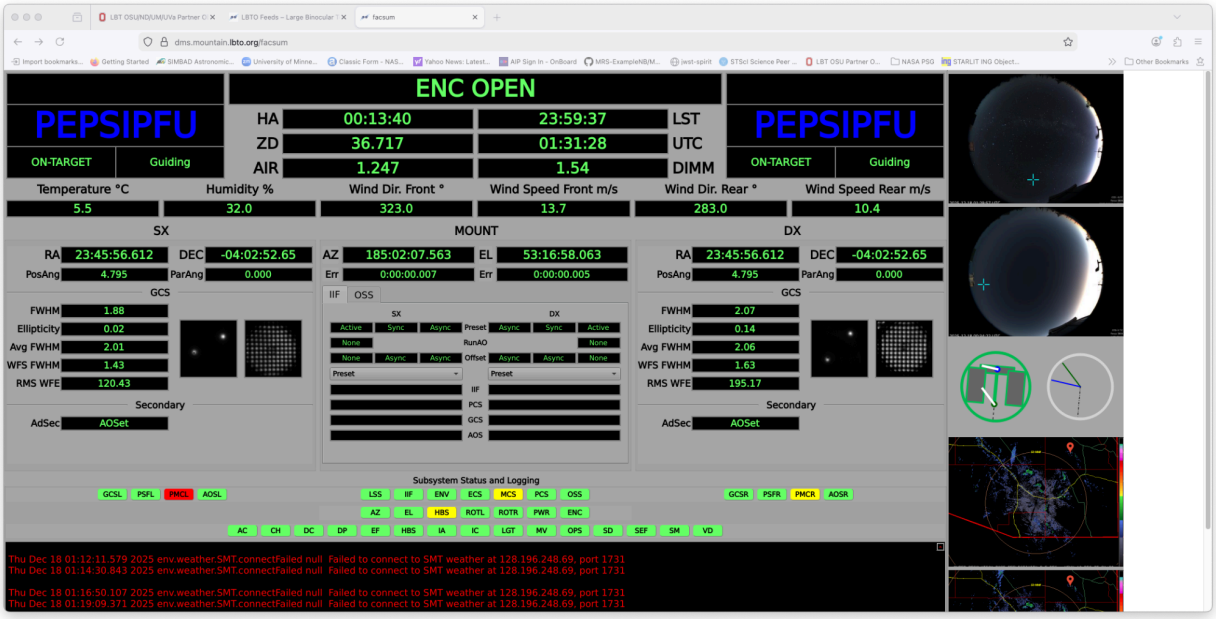
UTC 00:56 start observing sequence with 100 micron fiber (0.74 arcsec On-Sky aperture diameter) CD1 and CD4 (15 min exposure), Titan 0.5 arcsec disk, which is greater than the current seeing size. File start 2-251218.053


PEPSI@LBT
View
Target
Object: Saturn Titan
JulianDay: 2461027.54035
Date: Thu Dec 18, 2025
UTC: 00:58:06.4
LST: 23:27:19.1
RA: 23:47:16.95
Dec: -03:54:12.6
Hour angle: 23:40:02.1
Parallactic: -007:02:39.5
Azimuth: -008:18:36.5
Altitude: 53:05:25.4
Zenith dist: 36:54:34.6
Airmass: 1.251
SSB time: 16.766
SSB vel: 23840.893
Phase: 0.9973
Diameter: 1.496
Preset
Active
Guide
Acquire
Track
Guide star: 0
POS
PAR
BINO
MONO
Left SX
Right DX
Sync SX/DX
Large Binocular Telescope
Temperature: 5.2
Humidity: 36.6
Sky: 16.7
WindSpeed: 11.0
RA: 23:45:56.61
Dec: -04:02:52.6
Azimuth: -008:54:38.0
Altitude: 53:03:24.6
Parallactic: -006:55:31.3
UTC: 00:58:04.7
LST: 23:26:08.1
Local Time: 17:58:05.1
X range: 79 161 (82)
Y range: 177 259 (82)
WindSpeed, m/s
17:00:00
17:10:00
17:20:00
17:30:00
17:40:00
17:50:00
Left: PEPSIPFU
Rotator: 210:00:12.5
Hotspot X: 391.00
Hotspot Y: 375.00
Focus: 30000
Seeing: 0.97
GCS+WFS: OK
Right: PEPSIPFU
Rotator: 210:00:21.3
Hotspot X: 347.88
Hotspot Y: 376.23
Focus: 30500
Seeing: 1.00
GCS+WFS: OK
Offset: 0.25
Bin: 4
Filter
ND0
ND2
ND3
Guider
Engage
AIP
PEPSI LBT
Control Interface
Maintenance
Seeing
Flux
Humidity
Wind
Clean



UTC 01:13 Start next Titan CD pair, CD 2 and CD 5 (15 min exposure) file number 20251218.054, seeing now up a bit to 1.1 arcsec. The SN in CD1 and 4 exposure about 200 in the red (CD4). SNR CD2 80 and CD5 270

UTC 01:29 Seeing flared 1.8 arcsec, ugh. Star next Titan CD pair, CD3 and CD 6 (15 min exposure) file number 20251218.055, winds a bit higher 12.8 m/s now temperature and humidity holding stable

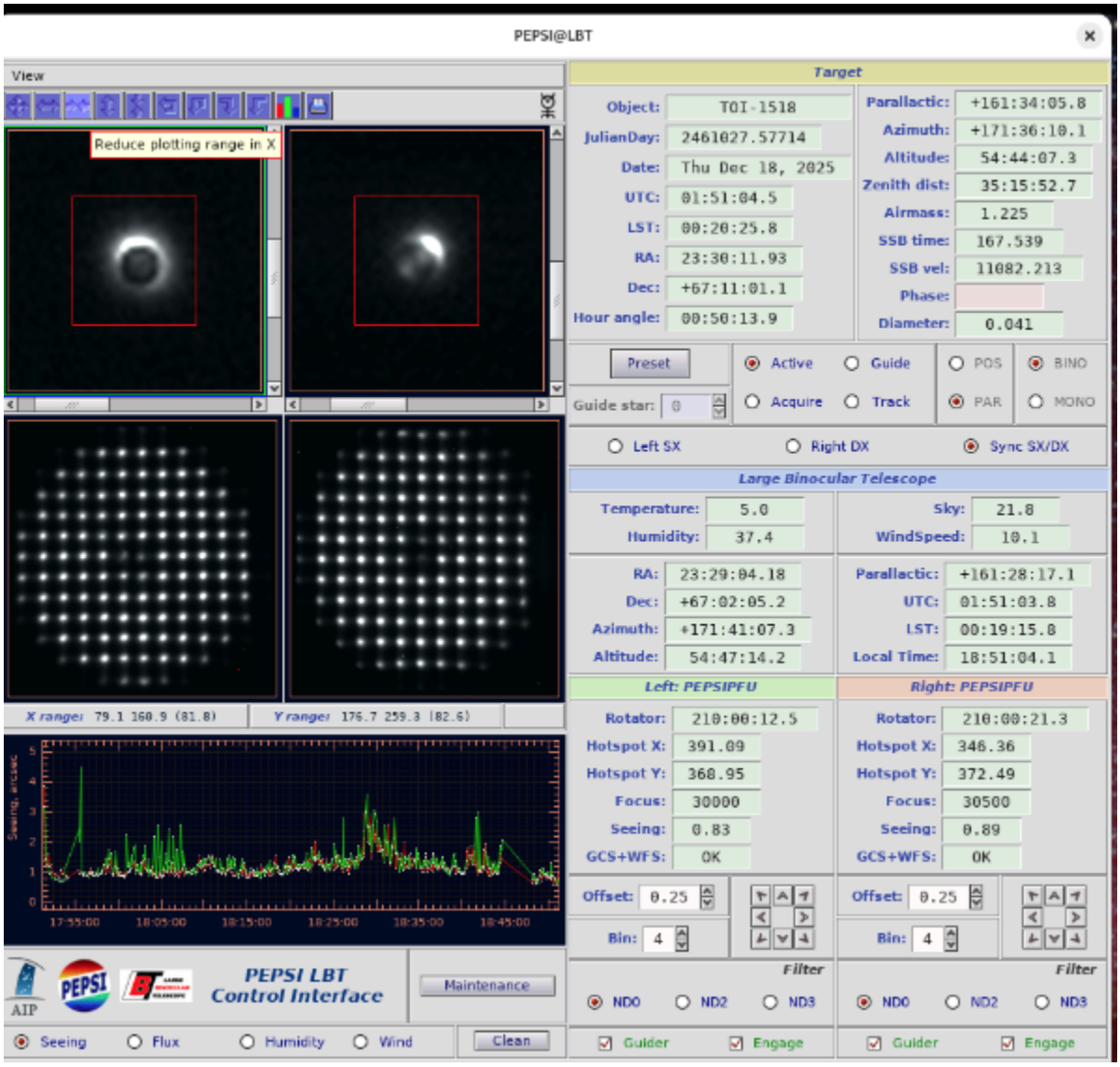


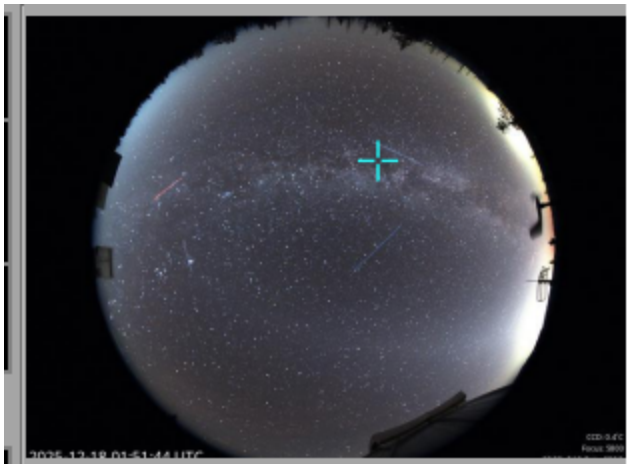
UTC 01:37 seeing now starting to settle down to around 1.2 arcsec as the integration continues on the Titan CD3 and CD6 pair (about 7 more minutes of integration remaining) SNR 120 (CD3) and 220 (CD6) in the end.

UTC 01:44 completed UM Saturn/Titan program slewing to next target TOI 1518 transit.

OSU_PETS TOI-1518

UTC 01:48 switch to 200 micron fiber and setup on TOI-1518 transient, to go first CD 3 and CD 5 only and 70 exposures at 4:10 min each (many times over) until we get to the horizon, seeing much better at this position about 1 arcsec now.





UTC 01:53 current all sky camera image above, winds ~10 m/s, temperature 5C, RH 37.0% at the moments average FWHM SX 1.03 arcsec; DX 1.10 arcsec

UTC 02:22 chugging away seeing now ~0.88 arcseconds at initial cycle of 8/70 exposures, guiding looks fine, airmass 1.25.

UTC 02:48 grinding away seeing stable, skies clear

UTC 02:51 SX AO ripped (high winds on secondary activated it looks like, in log dump) so need to stop and fix on exposure 13/70 with about 50seconds left in the exposure. Abort; bring the telescope up to zenith (pointing into the wind but it's only 10 to 13 m/s). Alex brings up ADSec Gui to attempt recovery.

UTC 03:01 SX recovered, presenting back to TOI-1518 with the low elevation limit set.

UTC 03:05 Adjust the focus a bit and send again active present and let SX collimate

UTC 03:06 Rolling again on the TOI-1518 exposures, Airmass=1.29, wind speeds ~13.9 m/s front. Seeing still about 1 arcsecond or less.

UTC 04:35 another period of flaring seeing for a few moments up to 1.5 arcseconds

UTC 05:36 still chugging away, seeing now about 1.45 arcseconds stable, wind 11 m/s, temperature = 4.6C, RH = 29% AM = 1.628, nice and clear out

UTC 06:39 about another hour before hitting the 26 degree limit, seeing still about 1.52 arcseconds, guiding fine.

UTC 07:28 about 15 mins to the limit, seeing back down to 1.15 arcseconds

UTC 07:34 getting ready to finish up, last exposure 54/70.

UTC 07:35 Done with TOI-1518 average SNR 200+; Take care of restarting the AdSec now.

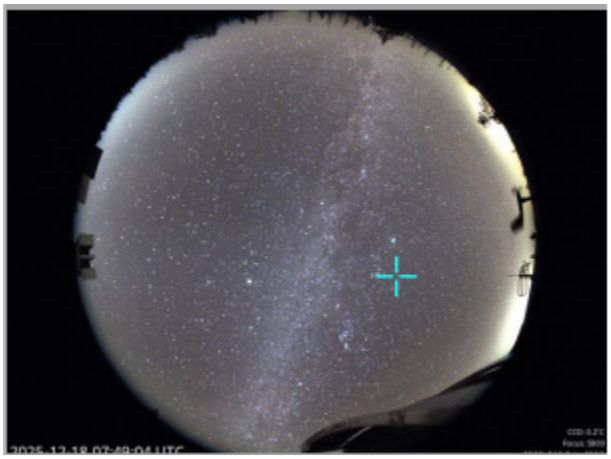
UTC 07:42 Completed the restart of the AdSec (disabling one of the magnets per Guido's instructions)

ND_RPED Gaia 004736

UTC 07:43 Pre-set to ND target Beers Gaia 004736, using the 300 micron fiber, send acquire present as we need to re-collimate after starting up the AdSec.

UTC 07:47 Preset again now, target on pinhole, collimating completing SX and DX.

UTC 07:48 Start observations ND Gaia 004736, CD 3 and CD 5 pairs (18 mins of integration) AM=1.12, seeing about 1.3 arcseconds, (DIMM 1.21) still clear out



UTC 08:06 ND Gaia 004736 complete SNR=230 (CD3); SNR = 140 (CD5)

OSU_ASASSN-24fw Gaia 00512

UTC 08:07 Preset to ND Gaia 00512 (Fores) 300 micron fiber

UTC 08:11 Start ND Gaia 00512; CD1 and CD4 (27 mins of integration), seeing 1.07 arcsec, AM=1.123, wind speed front 2.3 m/s, temperature 5C, RH =33.3%, clear out

UTC 08:39 ND Gaia 00512 complete SNR=135 (CD3); SNR = 117 (CD5)

ND_RPED Gaia 72640

UTC 08:40 Preset ND Gaia 72640 (Beers) 300 micron fiber

UTC 08:43 Start the ND Gaia 72640 (Beers), increase guider gain as the target is 14th magnitude, CD3 and CD5 (30 min integration) AM = 1.075, seeing about 1.00 arcseconds, front wind speed 10 m/s First set of exposures SNR=160 (CD3) and SNR=120 (CD2), continuing

UTC 09:42 Completed the ND Gaia 72640 (Beers) observations.

UM_2025N1 Comet 3/I ATLAS

UTC 09:44 ready to slew to the comet using the LBTO NSGUI, but first head to a nearby point star to check telescope pointing.

UTC 09:50 Preset with PEPSI first to comet position as a test of pointing. Now a new problem with left (SX) not updating

UTC 09:56 Need to check status of LBTO status, Josh restarts GS in an attempt to restore communications with PEPSI, resend SX pre-set. Fails,

UTC 09:59 Ilya restarts PEPSI interface, and this seems to work.

UTC 10:00 NSGUI override set by Alex, resend the pre-set with the NSGUI enabled, uses polynomial approximation to track trajectory. Still struggling to get the telescope to properly respond. General hanging, track abort (seems like a problem with the TCS that has come up in prior shifts). Josh scans through IT reports to find a solution

UTC 10:06 abort both GCS's.

UTC 10:07 Possibly some weird network glitch as the VPN fails. Right side pre-set failed. Josh had to clear lot of pre-sets out of IFA's

UTC 10:14 Start sequence CD1 and CD4 200 micron fiber, DIMM 1.63m temperature 3.7C, Vatican reports seeing 1 to 1.5 arcsec. Crap hot spot now gone on the DX side all of a sudden and moved. Resent the right side again to recover. Looks like we will have to extend exposure to get missing right side of CD1 .. Seeing acquire bad.

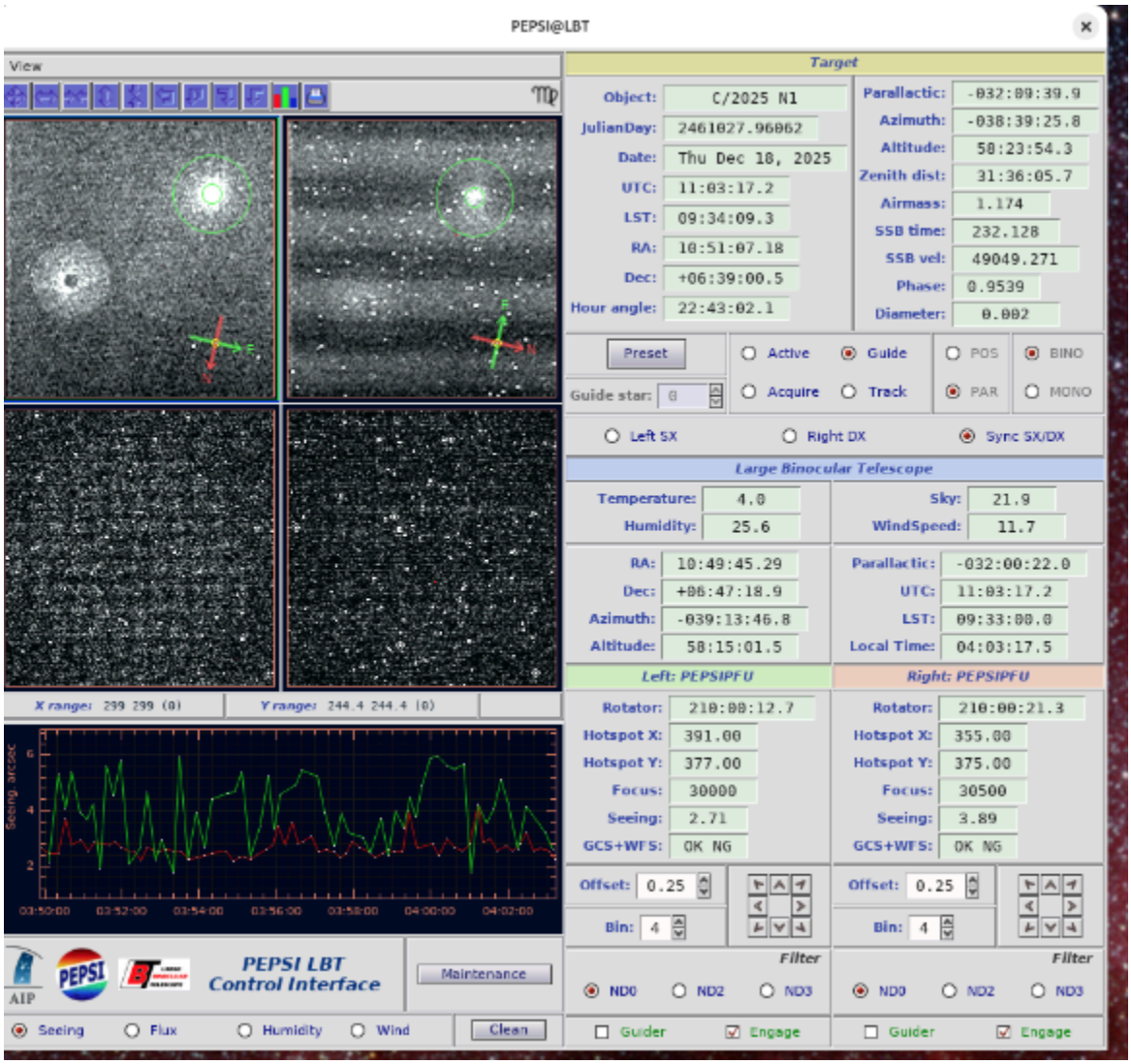
UTC 10:26 Abort integration and resend track present.

UTC 10:28 Turnoff NGSGUI. Forced to restart PEPSI GUI again as screens are not updated. Failed.

UTC 10:32 Head back to the bright pointing star to get to something point at to get things straightened out, tweak the pointing. Confirm that everything is working on star.

UTC 10:35 send a track preset from PEPSI to the position of the comet (note with track preset the GCS does not update the images). Send acquire pre-set to force images to appear.

UTC 10:45 Start CD1 and CD4 (20 minute exposure) comet to get photons finally after all the technical issues. Perhaps comet brightness is currently pushing the limits of the guider and wavefront sensors (?) See sodium in emission in CD4 (SNR = 39), not much continuum in CD1 (SNR = 18)



UTC 11:06 starting next pair CD2 and CD5 (20 minute exposure), DIMM seeing now holding near 2.0 arcseconds

UTC 11:18 lost DX (12 minutes into 20 min observation) hot spot; resend preset DX to see if we can get it back on the hot spot, got it back … ;-) continuing integration … SNR = 16.

UTC 11:27 starting last CD pair CD3 and CD4. Lost DX again 3 minutes in, send preset on DX again, DX back continuing integration….

UTC 11:47 finish comet.

ND_RPED Gaia-150784

UTC 11:48 Send preset to ND Gaia-150784 (Beers), preset fails so Josh has to do his magic to recover again.

UTC 11:56 ok things fixed again, starting up PEPSI observations ND Gaia-150784 (Beers) CD2 and CD 4 (2 x 20 min), 300 micron fiber; seeing back down to 1.25 arcseconds, temperature 4.2C RH 25.8% font wind speed 12.2 m/s, AM =1.002. Final SNR=132 CD4 and SNR=76 CD2

UTC 12:17 CD3 and CD5 start integrations, seeing now subarcsec ~0.9

UTC 12:37 finish the ND Gaia-150784 (Beers) program

ND_RPED Gaia-32928

UTC 12:38 Preset to last target of the night ND Gaia-32928 (Beers), pre-set hanging again Josh fixing, abort preset; however it does not come back to PEPSI status as being canceled, back to trouble shooting of IAF ….

UTC 12:49 … need to reboot IAF this time, also kill the PEPSI gui and restart all and restart connection to GCS

UTC 12:52 … again try to restart again fails, again Josh stops the pre-set. Hot mess again.

UTC 13:02 CALL END OF NIGHT AS SOFTWARE GROUP NEEDS TO FIGURE OUT ISSUE.