OSURC Nightlog 20221013UT

Observer*: Olga Kuhn, Ilya Ilyin (helping us get started with PEPSI)

Lead Partner Observer*: Rick Pogge, Subhash Bose, Michael Tucker (OSU)

Telescope Operator: David Gonzalez Huerta

AO Support*:

*** = from home**

Night Info (AZ Time):

- Sunset: 17:53
- Nautical Twilight Ends: 18:43
- Astro Twilight Ends: 19:12
- Moonrise: 19:37
- Astro Twilight Starts: 5:00
- Nautical Twilight Starts: 5:29
- Sunrise: 6:19
- Moon Illumination: 87.4% at midnight

Plan:

PEPSI program, CD3 and CD5 configuration, UM Nova & two OSU BHB

LUCI (highest priority long-slit and imaging)

MODS targets

PEPSI end of night (CD3/CD5 config) rest of OSU BHB

Summary:

Mixed program working around a combination of bright moonlight, clouds, and technical problems. Seeing started out sub-arcsecond and only a few clouds, then >1-arcsec seeing and increasing clouds.

Could not execute the planned LBC imaging programs because of failure of the red tracking computer (RTech) which would not boot up (daytime service planned the following day to address this issue). Some jumps in the telescope were observed.

Observed with PEPSI, LUCI, and MODS

PEPSI successfully observed the UM Nova and two OSU BHB targets. One of the three end-of night BHB targets (J0635…) was also successfully observed. The targets successfully observed with PEPSI are here and the full PEPSI log, including calibrations and aborted exposures, is osurc_20221013UT.txt

Switched to LUCI but took more than an hour to start science observing on the first target due to a combination of telescope and LUCI problems before successfully executing the planned long-slit observation. Data were impacted by transparency (bands of cirrus) and variable seeing. LUCI imaging targets executed, but deteriorating transparency caused occasional loss of guide stars.

Briefly switched to bright MODS targets, but moonlight and increasing clouds caused problems, and some images were compromised by telescope mount oscillations.

Reconfigured back to PEPSI for the end-of-night BHB targets with the night's CD3/CD5 configuration. First target successfully observed through clouds, but increasing clouds and telescope mount jumps required aborting the following target.

Closed for end of night calibrations after the last PEPSI target was aborted.

Issues:

Had to reboot azcam for agw7 and agw8 at the start of the night

LBC Red Trackers - RPC error. The machine does not seem to be coming up, or it comes up but is not on the network. Critical IT 8742. Had to cancel the LBC part of the program for tonight since we have no way to guide with LBC Red.

Occasional jumps in the telescope mount were observed (same jumps on both sides). One jump with LUCI occurred during slit acq and required re-acquisition.

Weather:

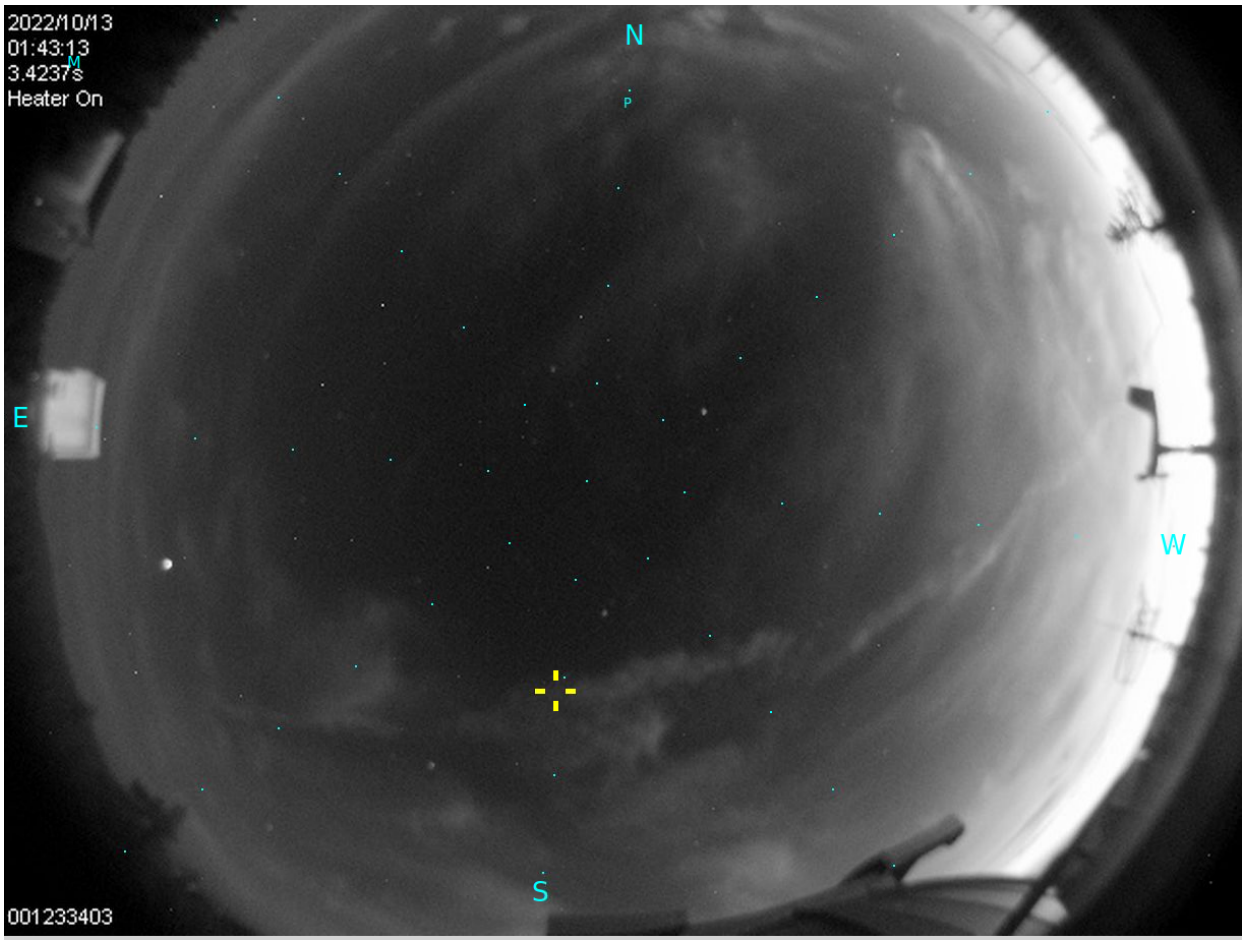
Sub-arcasecond seeing with bands of cirrus at the start. Clouds increased in sky coverage through the night and seeing degraded to >1-arcsec. Both seeing and cloud coverage followed their respective forecasts (ALTA and NWS). Clouds made moonlight a factor, but a good choices of bright targets and guide stars helped.

Night/Closed Dome Log (times are given in UT)

58 Aql & V1405 Cas

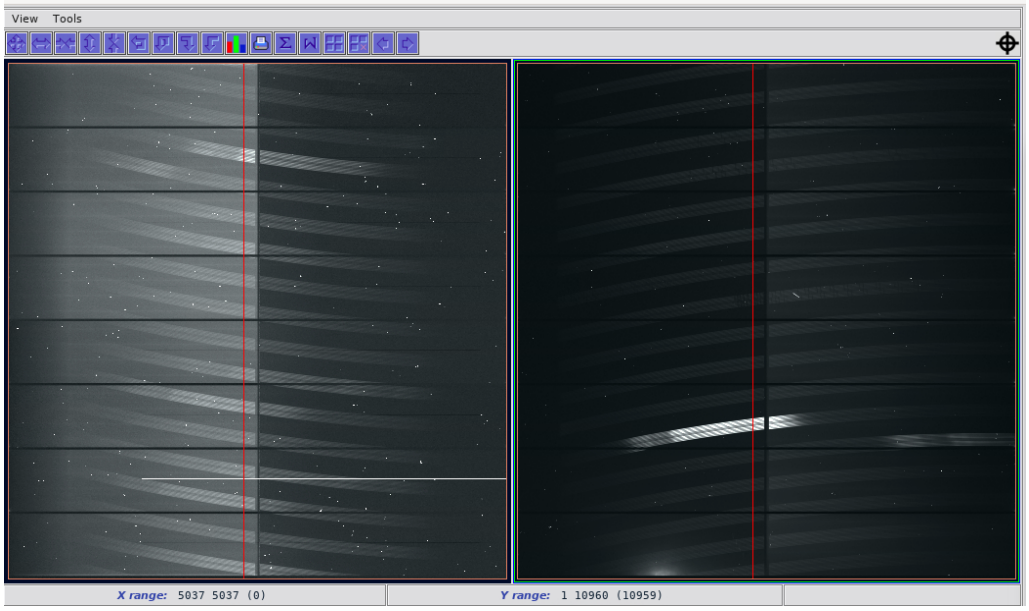
01:38 Preset to 58 Aql

01:44 Starting the exposures.



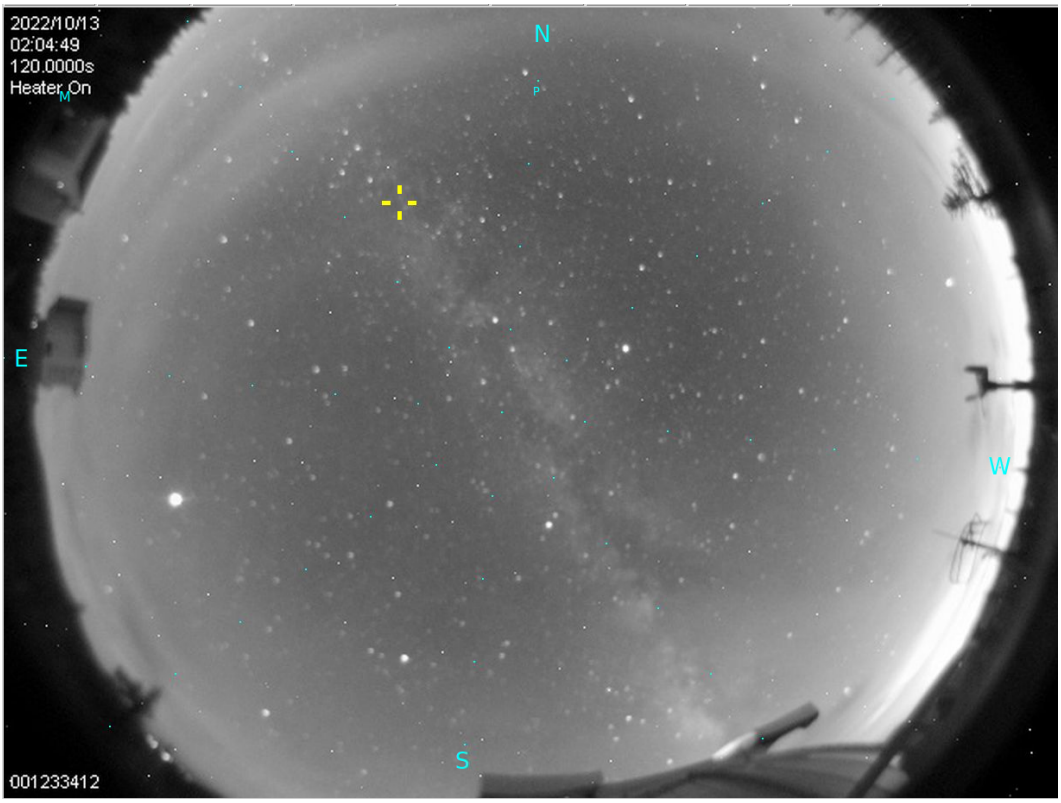
01:54 Slewing to V1405 Cas

01:59 Starting the exposures, stopping after 1 minute so we can verify it is the correct source (Ilya's test). We see Hbeta in CD3 and Halpha in CD5.



02:02 Starting anew.

02:09 All sky camera image:



02:11 Seeing is 0.52"/0.72" on SX/DX

02:39 Finished and we got about SNR ~ 200 in continuum on CD5 in 30-min and huge SNR on Halpha. Max 11,000 counts on Halpha.

2MASS J19375484+2947371

02:39 Slewing to J19375.

Pointing check needed - no star found on DX.

02:56 Starting the exposures

02:57 A jump on SX (see WFS image).

Finished - SNR 133 in CD5 and 76 in CD3

2MASS J00153291+3841198

03:22 Slewing - no star found on SX. David did a pointing correction and I resent preset on SX - OK now.

03:37 Finished - SNR is 171 on CD5 and 67 CD3. Seeing was 0.7" on average.

03:45 Reconfiguring to LUCI

03:53 Pointing check — no star on either side, so David is spiral-searching.

04:23 Looks like we've found the star on both sides. I'm not sure what the problem was, but he had to go to a star closer to zenith (star was at elev ~40 deg). Reset encoders.

04:25 Collimation

OSU_XMDs_LUCI/SDSS J0133+1342

SDSS J0133+1342

04:28 Slewing to SDSS J0133+1342, but no guide star on the SX side…

04:30 Another pointing check is needed.

04:32 trying again - slew to J0133+1342

Acquisition: There was a problem with the acq mirror on LUCI1 but it doesn't appear it was fatal:

> 2022.10.13 04:33:28 s | error high | luci.luc | Luci ONE | ONE_Compensatio | AdjustMirrorThread.java#call(217) | Error during mirror adjustment
>
> 2022.10.13 04:33:28 s | instrument med | luci.luc | Luci ONE | ONE_Compensatio | SequenceImpl.java#executeTransition(312) | error while executing transition: "mirror four.2 - move motor"
>
> 2022.10.13 04:33:28 s | error high | luci.luc | Luci ONE | ONE_Compensatio | MCUClient.java#move(687) | Motion of motor card number: 2, motor number: 4, type: "mirror four.2", description: "fold mirror four motor 2" at motor control unit "rmi://localhost:60001/ONE_MCU_LUCIFER" was not completed in expected time! Check the hardware!

2022.10.13 04:33:28 s | error medium | luci.luc | Luci ONE | ONE_MCU_LUCIFER | ElectronicConnection.java#manageGrammar(260) | Timeout while sending "2 123 4 -727

" type:move! Should wait for 4,091ms.

The guide stars are oscillating on both sides of the hotspot, on both SX and DX — has to be a problem with the mount.

LUCI1 and LUCI2 images 0003 show this oscillation but it was also on the guider.

04:40 Initializing LUCI1 acq mirror - did not change the pos'n of field. Needed to adjust via AFC tab (the gap was 50 pix or so). Did so and resent the OB to re-acquire, but…

04:48 LUCI1 detector focus mechanism failed - reinitialized it and it was OK.

2022.10.13 04:46:00 s | error medium | luci.luc | Luci ONE | ONE_DetectorUni | MCUClient.java#move(693) | Error while moving motor card number: 2, motor number: 6, type: "detector focus", description: "detector focus" at motor control unit "rmi://localhost:60001/ONE_MCU_LUCIFER"!

Resent the OB:

L1: 8 & 9, 10 → 0.0401, -0.0059 to put target (1045.3,1035.36) on slit at (1045.64, 1035.31)

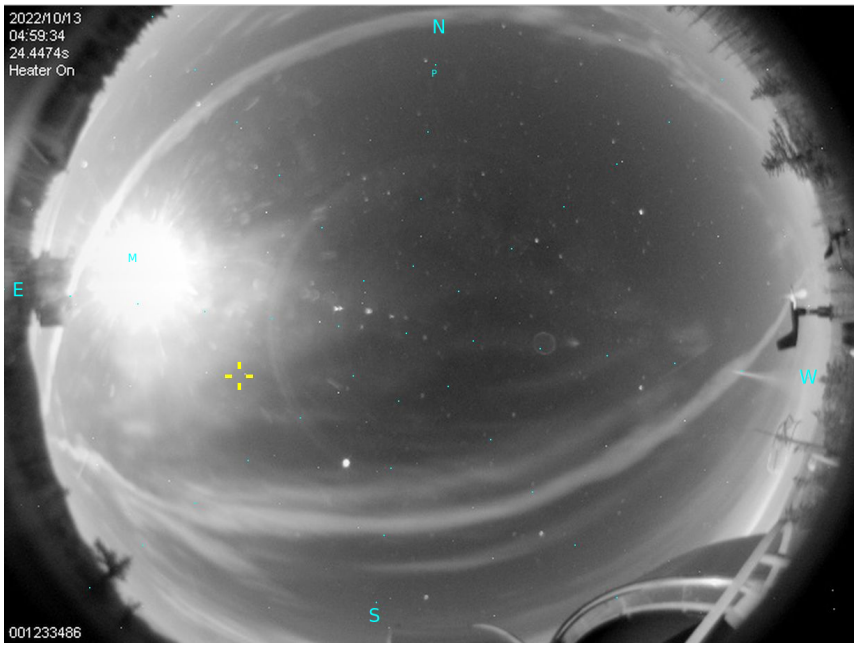
L2: 6 & 7, 8 → -2.6097,-00345 to put target (1054.10, 1043.04) on slit at (1032.17, 1042.75)

FWHM during acq is 5.5 pix (0.65")

Confirmatory slit images: L1 11 and L2 9 look ok - we can see the target.

05:02 Starting the science:

L1: 12-17 and L2: 10-15



05:09 or 05:10 the guide signal dipped about 0.5 mag as a thin band of cirrus passed over.

05:33 Seeing has worsened a bit and is now ~1" on the guiders.

We're seeing HeI and PaG on the differenced spectra.

HIP116886

06:07 Slewing to HIIP116886

L1 18 & 19 -9.78, -0.3935" to move star (1124.27, 1035.97) to slit at (1041.24, 1032.63)

L2 16 & 17 -13.27, 0.1678 to move star (1146.08,1041.56) to slit at (1034.53, 1042.97)

06:16 Starting the observations: about 3400 counts at the peak - nowhere near saturating the star.

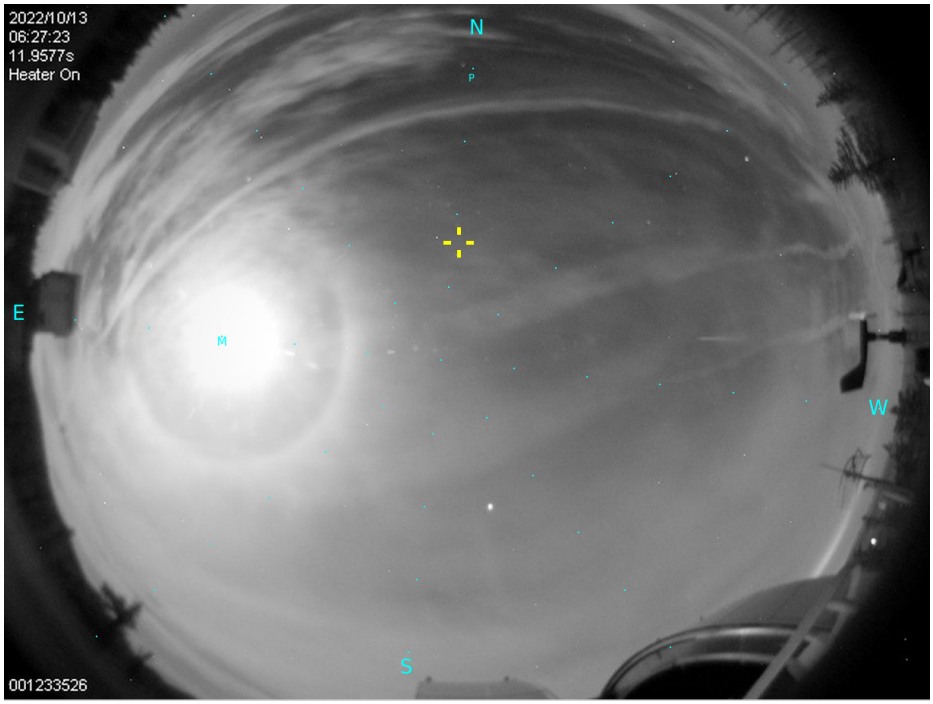
L1: 21-22 and L2: 19-20

UVa_nirjets/IRAS00259+5625 (clouds, did not finish)

The cirrus is increasing.

06:24 Failed to find the guide star on SX (due to pointing not cloud). David is doing a pointing check.

06:27 Resending the preset. The guide star was found on both sides - with clouds and moon, its signal is not that high above the background, but the guider/wavefront sensor are working with it.



UT	filters	L1	L2	comments
06:29-06:48	K+K	23-33	21-31	0.7"/0.8" on SX/DX (opt guider ~1")
06:48-07:19	BrG+H2	34-48	32-46	0.95" (opt guider 1.2/1.4")
07:19-07:54	J+H	49-53, 54-59	47-51, 52-57	15-min pause in the middle due to clouds, during which seeing worsened (1.5" on imges)
07:54	PaB+FeII	60-64, 65-67	58-62, 63-65	GS lost at 08:05, resume 08:06 for 3 more pairs, but the guide star was lost again. A thicker band was passing to the S - opted to switch to MODS.

06:35 During K+K, WFS is having trouble because of the weak signal.

06:46 Guide star is lost. At best, the guide star is 17.5-17th mag according to GCS but we're seeing dips of about 1 mag when clouds pass over. If guiding would not be required for the sky position, a brighter star might be used.

06:49 Guiding again - now star registers as 16.7 (DX) or 17.2 (SX).

07:03 There is a glint from the moon on the SX WFS images in the sky position, but this does not seem to be affecting collimation.

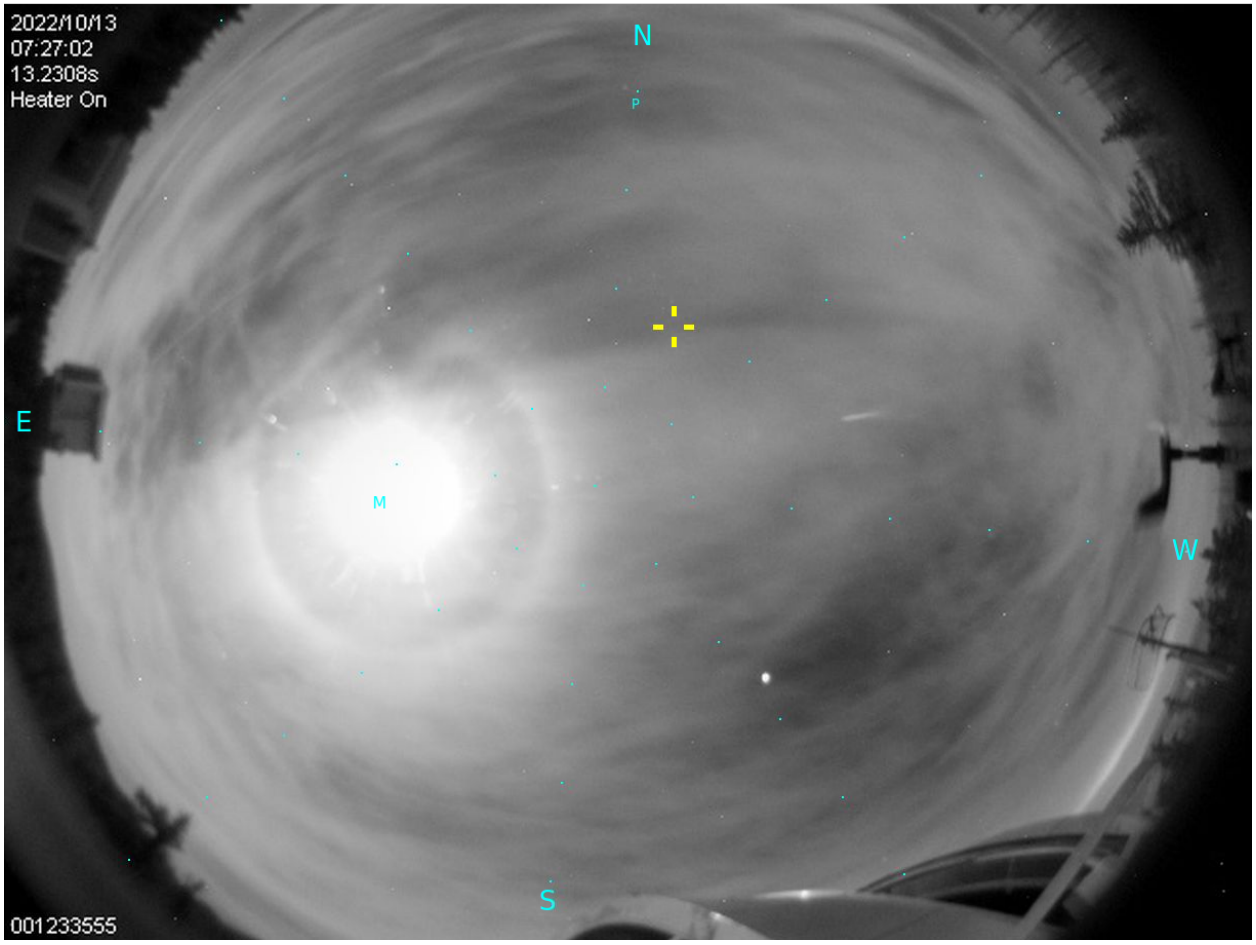
07:13 Lost guiding. 07:14 coming back on DX. This is on the 2nd to last BrG+H2.

07:15 Offset failed - because of lost guiding. I tried again, but the star was not found. 07:18 success. The last BrG+H2 image was taken, but there's a gap between it and the penultimate one.

07:19 J+H started

07:28 No star found on SX, but guiding on DX.

07:29 offset failed because we lost the guide star. Downtime as we wait for the guide star signal to come back.

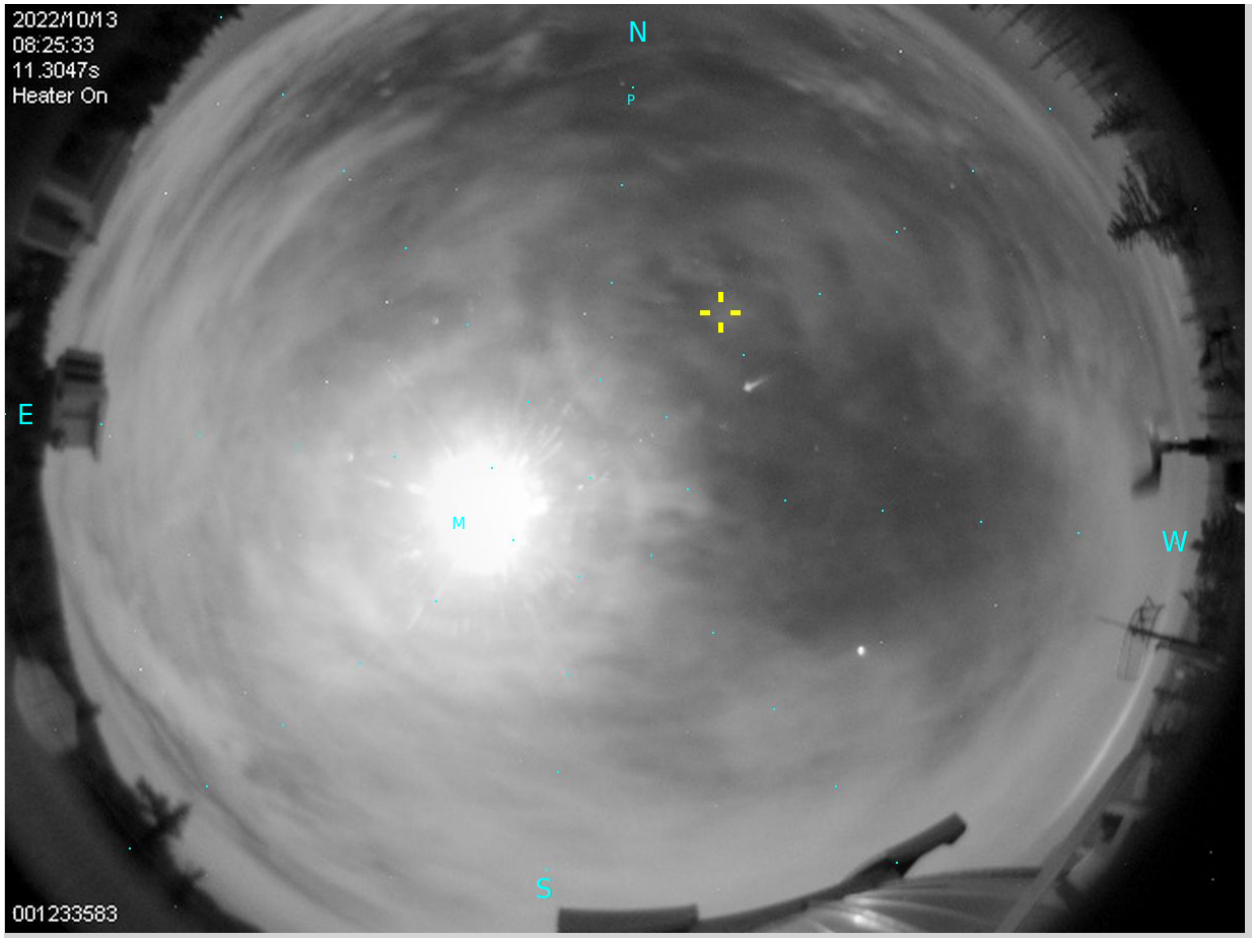


07:43 resume at L1 54 and L2 52.

08:05 - guide star lost again and the series, this time PaB+FeII is paused after L1 64, L2 62.

08:06 resume - but not for long. Lost again at 08:08 and came back at 08:11 (L1 66, L2 64 being taken, but the guiding is again lost and I'm pausing the script at 08:14 after L1 67, L2 65.

08:14 - no observing due to cloud



The situation is not getting better here - the guide star is faint and not showing up on the GCS images - guide star not found. We'll switch to MODS. 7 PaB and 7 FeII images were not taken.

09:04 Reconfiguring to MODS

09:29 David is checking the pointing. The clouds seem to be thinning a bit, but are still covering most of the sky.

Seeing is about 2.2"

OSU_ASASSN/ELLJ001532

09:40 acqBinoMODS ELLJ001532_UT1100.acq (uses PA=80, within only a few deg of estimated PA at midpoint of exposure so no change).

09:43 Resending the acq script since the preset initially failed. Guide star not found - clouds and poor seeing or oscillations again - we think the latter. David noted some jumps in the EL axis.

Sending an acquire preset to a 6.4 mag star. We see nothing.

10:14 Trying again

acqBinoMODS ELLJ001532_UT1100.acq

Seeing bouncing from 1.3 to 1.7-1.8".

m1r: 3 & 4 → offsetxy → 5, dx=-0.35 → 6, dx=0.2 → 7

m2r: 3 & 4 → offsetxy 4.020 8.305 → 5, dx=-0.123 → 6, dx=-0.13 → 7, dx=0.2→ 8, dx=0.123

Seeing has settled down, but hard to center up.

10:31 execBinoMODS ELLJ001532.obs

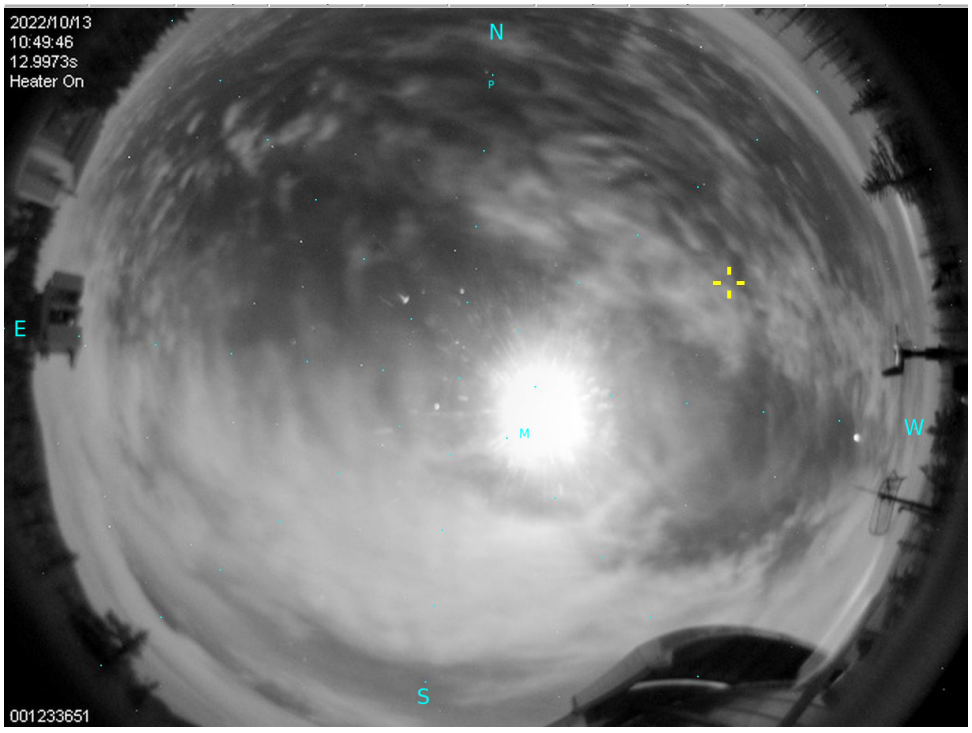
ut	m1b	m1r	m2b	m2r	AM	seeing
10:31	3	8	3	9	1.644	1"

10:40 - start of 2nd exposure in the series of 3, on both SX & DX, the star oscillated above and below (along EL axis) the hotspot and we lost the preset. The set of images m1b 4, m1r 9, m2b 4, and m2r 10 are all compromised by this oscillation.

10:40 lost preset.

10:49 Resending the preset (updated PA to 72 deg to match the parallactic angle better). The guide star is not found.

10:52 David is checking pointing.There are clouds, but the 6.4 mag pointing star was found.



10:55 Slewing again, but again the guide star is not found. The target is setting and there is no longer time for the acquisition and the 2 additional exposures. We are going

to switch to PEPSI. We did not observe a spectrophotometric standard, though the program was not completed and the standard, BD+28, was observed in dual grating mode last night (20221012).

11:02 Reconfiguring to PEPSI

11:12 Retaking calibrations as we reconfigure.

2MASS J06355255+1842337 (good)

11:37 Slewing to the target

11:40 Starting the exposures

Seeing is 0.92"-0.94" on the guiders.

There are still passing clouds causing about 1.5 mag of extinction.

But the SNR in CD5 is still quite good, 159, so meets requirements. Moving on.

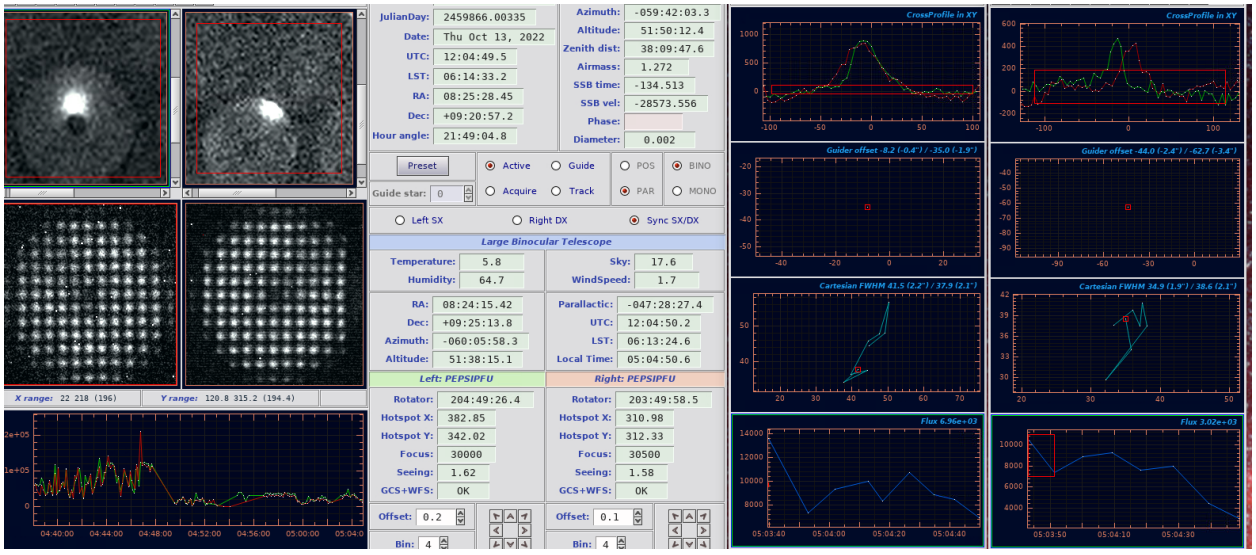
2MASS J08241542+0925137 (not completed)

We lost the guide star on SX.

Resent the preset with BS2 - I can see the back-reflected light,

and the WFS is working, but the star is off the fiber.

12:04 Resent the preset. Star started out on the fiber, but it is jumping.



12:11 read out the exposures and resent the preset with BS1 again

12:14 Starting the exposures. Seeing estimate 1.67". Lost the guide star on DX due to clouds. And now (12:17) we lost the star on SX due to clouds.

12:24 - clouds have thinned a bit, trying again. The DIMM and guiders report >2" seeing.

12:25 Starting the set of exposures - the FWHM on the guiders is 2.5" and it is not currently WFSing (the spots are too dim).

12:28 We lost the guide star again - stopping and reading out what we've got (5 minutes). SNR in CD5 is about 41 - I can barely see the spectra.

12:31 Closing up

Calibrations:

23:07UT (20221012): PEPSI calibrations with 200, 300 mic fiber and CDs 3 & 5.

01:03 Taking another set of PEPSI calibrations - same setup (only flats, got both flats & ThAr lamps 2 hrs ago and will repeat all after the PEPSI observations are done tonight).

12:31 Closed-Dome Calibrations: LUCI LS and LUCI imaging

Though the LS will leave persistence, I'll prioritize these calibrations since this was the program that was fully observed and clouds became thicker and compromise the imaging program.

LUCI

	L1	L2	
G200 zJ flats	68-72 73-77	66-70 71-75	lamp off lamp on - cont
	78-79 80-81	76-77 78-79	lamp off 60-sec Ne 60-sec (Ne did not fire)
	82-83 84-85	80-81 82-83	lamp off 5-sec Ar 5-sec
G200 zJ flats (rep) to get L2 Ne		84-88 89-93	lamp off lamp on - cont
		94-95 96-97	lamp off 60-sec Ne 60-sec (again Ne did not fire)*

The 60-sec lamp-offs show what looks like a dice-5 of Saturn.

* The L2 Ne lamp is not always firing. I took a couple manually.These are L2 98 & 99 are Ne lamps

Trying UVa_nirjets calibrations, but check for image persistence…

UVa_nirjets	L1	L2	
PaB+FeII	96-100 101-105	100-104 105-109	lamp off lamp on
J+H	106-110 111-115	110-114 115-119	lamp off lamp on
BrG+H2	116-120 121-125	120-124 125-129	lamp off lamp on
K+K	126-130 131-135	130-134 135-139	lamp off lamp on

… I don't see persistence from the lines in the arcs taken just previously, though in the lamp off flats, I see a hint of the dark, Saturn-shaped image noted above - very low-level.