The SARA Observatory
Southeastern Association for Research in Astronomy

SARA-KP OBSERVATORY DIRECTOR'S REPORT

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I. Introduction

The October 2021 – March 2022 observing period occurred with pandemic constraints winding down. Mountain staff were initially still at a minimum and winter weather was quite poor. The telescope focus mechanism was finally repaired, however, leading to more efficient observing. Although nights were lost to technical issues, most of these were intermittent or single night failures that were resolved. The major observing issue currently is a very dirty main mirror leading to significant loss in flux to the instruments.

II. Telescope Usage

Table 1 on the next page illustrates the statistics for use of the telescope compiled from the observer's report archive. The format mainly provides simple percentages for the hours used versus the hours lost due to either weather or technical issues from the nightly observer reports. The last column lists the number of nights for which a report was not filed for each month. As can be seen in the table, three months had more unreported than reported nights leading to very poor statistics. There was an extended shutdown in November due to the repair of the focus mechanism and at the end of December as ACE was not available for emergency dome backup. A brief review of KP LTO reports did indicate periods of extended poor weather, but using March as a huge outlier with 19 unreported nights, LTO reports indicate only 10 nights fully lost to weather. I will note numerous nights given up by scheduled observer (several with late notice) were not utilized by others as shown in the reports. For those nights with observers reports, the semester average was 66% clear skies versus 30% lost to weather and 4% lost to technical issues (December was outlier). A shutter failure due to a loose

cable led to the major December technical loss, but most technical issues have been with a sticking filter wheel or software glitch requiring restarts or initialization delays.

Table 1: Telescope Usage Statistics for 01 October, 2021 to 31 March, 2022

Month	Hours Worked	Clear	Weather Losses	Tech Losses	Unreported Nights!
October	109	78%	17%	4%	13
*November	46.5	75%	24%	1%	*22
December	33	31%	57%	12%	**18
January	121.5	68%	30%	2%	10
February	125	67%	32%	1%	7
March	77.5	77%	21%	2%	19

*Focus Repair Closed Observatory for about a week, weather was also quite poor this month
** Bad weather and extended Holiday closure as ACE out of town end of month

III. Observatory Issues

Focus mechanism was repaired, a few glitches have been reported but essentially it is now working fine. The most common reported issue is a sticking filter wheel. This dominates the reported technical problems. ACE is aware of the issue. Cause is not known for certain but initializing the wheel typically allows move to be completed. Wheel movement has not been reliable for filter sequence observing, however. ARC ccd shutter had one instance of failure traced to a loose cable. There was one instance of guider stage appearing unresponsive but not repeated. There were several reports describing poor tracking, typically at low elevations and in the west. Observers did not indicate use of autoguider or not in these instances but the telescope has always had poor tracking in those quadrants. I have noted a flux decrease for spectra observations and Bill Keel provided flux comparisons for the present conditions (in February) versus a cleaned or new mirror surface from previous years. Compared to a “new” surface, the flux level is now down about 30% and the mirror was last resurfaced in 2018. ACE is currently checking with KP staff about getting the mirror aluminized during the upcoming summer shutdown which is highly recommended.

Dome UPS was still offline at end of 2021 leading to extended holiday closure with ACE out of town. Its current status is not known at the writing of this report as ACE was attempting repair versus the more expensive replacement of the entire unit. Both weather station and all-sky camera are not currently operational. ACE was working on both in late fall 2021 but their status is also currently unknown. Although KP weather information and sky imagery is still available through resources at other KP sites, local conditions for wind and humidity are very much needed.

IV. Main Instrumentation

- **ARC Camera -** Other than the one shutter failure incidence, camera appears to be cooling fine with no reported problems as to noise, readout issues, etc.
- **Spectrograph –** Few observers use this instrument, ASC observers were trained this semester, reported issues due mainly to unfamiliarity with the operation. No known problems with spectrograph and detailed operations guide is available as well as training by G. Henson.
- **Computing Facilities** - There are no currently known problems with the observatory computers. Disk storage space is currently adequate for observers but they are reminded to periodically remove old files.
- **Weather Station** - Currently not functioning as described previously. Observers have been using KP resources but will push ACE to get the weather station back online.
- **Dome Cameras** - The OWL DVR is still accessible through browser pages, although only one camera gives consistent video of the telescope. Instructions for access will be put on computer desktops as several observers have not made note of them.

V. Action Items

Mirror should be resurfaced this summer.

ACE needs to perform thorough maintenance on filter wheel.

Dome UPS needs repair or replacement ASAP.

Weather station (all-sky camera) needs to be brought online.

Future, less urgent needs, with long histories: tracking problems in the west and thermal control (maybe secondary re-configuration) for poor seeing but these are long-term and likely very costly efforts.