



# **SARA-KP OBSERVATORY DIRECTOR'S REPORT**

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*by*

*Dr. Gary Henson, Director*

*SARA Observatory*

*and*

*Department of Physics & Astronomy  
East Tennessee State University*

## **I. Introduction**

The November 2023 – April 2024 observing period was affected initially by problems with the shutter for the main ARC ccd camera. Winter weather also appeared to be exceptionally poor with some long term storm systems early in 2024. Normal procedures for road access to Kitt Peak finally resumed (although precautions still needed from summer 22 fire damage). Although a couple of equipment issues led to some extended down time periods, it seems (though not confirmed) that weather closure was abnormally high for this period. An alarmingly high percentage (**50%**) of scheduled nights have no observers reports for this period!

## **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 for data acquisition 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 stated in the introduction, observers did not report for half of the scheduled nights. This was particularly extreme for the months of March and April and the mountain weather was clearly not so poor as to lose half of all nights to poor observing conditions. The large percentage of tech losses in November was due to the failure of the replacement shutter for the ARC ccd camera and the poor timing of its occurrence (a weekend with clear skies!). The tech losses in December and February were primarily communication issues with computers or a failure of the dome UPS to come back on after extended main power outages. ACE has been asked to look into the cause of the UPS problem, but a report from them has yet to be received. The reports do indicate major winter storms of a week or longer in duration occurring at least once in January and once in February. The winter weather pattern for the US west in general was very wet with significant late winter snows in mountain areas.

Table 1: Telescope Usage Statistics for November 1, 2023 through April 15, 2024

| Month                      | Hours Worked | Clear | Weather Losses | Tech Losses | Unreported Nights! |
|----------------------------|--------------|-------|----------------|-------------|--------------------|
| November                   | 97           | 50%   | 25%            | 25%         | 11                 |
| December                   | 102          | 63%   | 32%            | 5%          | 11                 |
| January                    | 73           | 43%   | 57%            | 0%          | 14                 |
| February                   | 58           | 39%   | 54%            | 7%          | 13                 |
| March                      | 51           | 50%   | 50%            | 0%          | 19                 |
| *April to 15 <sup>th</sup> | 19           | ?%    | ?%             | ?%          | 13                 |

\*Total Solar Eclipse on 8 April, long weekend disrupted observing for many, only 2 of 15 nights reported so no relevant statistics to report.

### III. Observatory Issues

Several nights at the beginning of November were lost due to a power supply problem with the replacement shutter. This was fixed and the shutter has worked reliably since then. This issue was discussed at the November 2023 Board meeting as the replacement shutter required a retrofit and design effort from ACE and the availability of such large mechanical shutters for the future is uncertain. The only major issue of concern involves dome control after a long-term main power outage. The dome does have a new large UPS which performs as required for brief periods and allows for safe closure during a main power outage. However, it appears that after an extended power outage when the UPS has itself shutdown, it fails to restart when main power is restored. This has required an on-site visit by ACE to manually restart. I've asked ACE to check on a fix for this issue (which last occurred in mid-February), but have not had a response.

Observer reports indicate no other major or consistent issues. The filter wheels appear to be working ok; the new dome camera works well and the weather station should nominally be working, too. However, observers must be aware that the software (or website) for both must be restarted/reinitialized after computer restarts and the weather station may also require a power recycle for it to re-establish communication. I am looking to update observer guides this summer, perhaps send out a "short form" of a "faq" or "troubleshooting" list for the more common and typical issues noted in the observer logs that could be easily addressed by the observers themselves. There were also a couple of reported issues with remote communication to the dome computer(s). It's not clear if the cause was at the dome or local to the observer but the issues apparently did not persist and a resolution was not reported.

Bill Keel recently noted a light leak issue for the ARC ccd which I suspect is arising from the new shutter mount (requiring a new spacer between the dewar and telescope backplane). However, this appeared with 1-hour dark frame integration times *during the day* and the count rate is negligible and on the order of bias variations. Overall, the ARC ccd and its closed cycle cooling unit are operating fine. The spectrograph should also be working

nominally but I have used it only sparingly this period, primarily due to the loss of many nights to poor weather.

The camera computer has sufficient hard drive space, but Board members should remind all observers to clean up both their hard drive directories and more importantly their “Dropbox” files for data transfer back to their home institutions. We have limited space for the Dropbox associated with the observatory computer account and use for file transfers is only temporary!

Finally, the primary mirror is in desperate need of aluminization. We need to both budget for that and get ACE to schedule for it with a local vendor (or with Kitt Peak) for the summer shutdown period.