



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

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*by*

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## **I. Introduction**

The April 2023 – October 2023 observing period occurred with an early onset to the monsoon season and major instrument issues upon the September restart. Access to the mountain was still being tightly controlled by ADOT as the mountain road remained dangerous for travel after the summer 22 fire damage. Spring and early summer operations were typical, but fall has seen huge time losses due to instrument failure.

## **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. Too few nights were reported for September and October although there were extended times with the main imaging CCD unavailable and observers informed of the non-operational status. I can note those extended periods in my records or through contact with ACE, but it is still the case that too many nights go unreported for reasons unknown.

With a potential for an early monsoon pattern and conflicts with ACE staff scheduling, the observatory was shutdown about 1 week earlier than normal in July. There was also a weather delay in opening for the end of August, 1<sup>st</sup> of September time frame. No work was done at the observatory or on observatory equipment during this summer shutdown period.

Table 1: Telescope Usage Statistics for April 1, 2022 through September 30, 2022

Month	Hours Worked	Clear	Weather Losses	Tech Losses	Unreported Nights!
April-from 16th	82	100%	0%	1%	4
May	82	60%	34%	6%	12
June	110	89%	11%	0%	15
July up to 10th	50	78%	18%	4%	2
August	SHUTDOWN				
September	17	24%	26%	50%	21
October	48	51%	3%	46%	19

Weather statistics were good for the spring and early summer. Tech losses were minimal and mainly due to a sticking filter wheel. Ace identified a worn belt and disabled access to little used filters as a temporary fix. Although lingering monsoon weather affected September observing, problems with the ARC ccd dominated the lost time. Spectroscopy was still operational but few observers use that instrument.

### III. Observatory Issues

Good news is that at the time of this report, the observatory is fully operational. However, issues with the ARC camera electronics and shutter led to extended down time for photometry operations in September and October. There was also a dome control failure, continued filter wheel glitches, and lack of a decent dome camera as well as local weather station issues.

The ARC camera was having over-heating problems with its external electronics so ACE replaced the camera with the backup from CT. The problem turned out to be related to the power supply at the telescope so the original camera is also still in working order and we have, thus, still a backup. The diagnosis and replacement took about a week. However, upon restarting photometry operations, the mechanical shutter failed. ACE disassembled the shutter and found it was worn out and beyond repair. No spare shutter was available (it is uncertain what happened to the CT shutter) but ACE was able to locate a suitable replacement which required design and manufacture of a new housing. Although the ccd was operational without a shutter during this down time, science observations were questionable so ~2 weeks without photometric observations. The new shutter experienced a temporary failure due to a power supply issue that was quickly resolved with only a few nights lost.

The primary mirror was not aluminized during summer shutdown and this should be done asap. A dome circuit breaker was replaced which should prevent dome control issues (this was a safety problem for remote observations), a new filter wheel drive belt was installed in October, the guider X stage was serviced, and a new dome camera (PZT type) has also been installed. UPS batteries were replaced for the computers. Communication with the dome weather station was also re-established although most observers still tend to use the mountain weather sites. There is still no All-Sky camera for the dome but again the mountain camera is accessible.

NOIRlab reopened Kitt Peak for public access (limited to weekends for now) at the beginning of November. Overall, Kitt Peak operations have slowly come back to normal after the June 2022 fire and all SARA observatory operations are currently back to normal.