SARA OBSERVATORY DIRECTOR'S REPORT

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by
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I. Introduction.

Text was lost.

II. Research at SARA.

The current setup with the AP7 CCD, and now the U55 continues to yield high quality publishable data, and some observers are also using the larger format Ap4. Martha Leake is operating her low-resolution spectrograph during visits to the dome as well. Once again, a variety of research projects are carried out at the SARA observatory.

- White dwarf stars (Oswalt FIT)
- Cool variable stars are also monitored (Henson ETSU).
- Cataclysmic variables, white dwarf and delta Scuti variables (Wood FIT)
- Binary star light curves are observed (Van Hamme and Samac FIU and Shaw UGA)
- Structure of Galaxies (Smith ETSU)
- Asteroids studies (Leake VSU).
- The search for and monitoring of gamma-ray bursts (Hartmann CU)
- Micro-variability observations of Blazars (Webb FIU)
- Photometric observations Seyfert galaxies (Rumstay VSU)

The research publications page is attached to the SARA web pages and was recently updated to include new publications. Please submit your publications to Bev Smith at ETSU so she can keep this page updated.

The acquisition of a new large format U55 camera should help in making SARA even more versatile than it already is. Plans to further cool the dome and telescope tube to improve the image quality are still pending. The amount of science we are doing is a testament to the efficiency of the SARA telescope and how well it operates on a day-to-day basis. In view of this success, the SARA board has discussed the possibility acquiring another instrument. A second telescope would be chosen to increase sky coverage (southern hemisphere), time coverage (longitude) or increase aperture

Although I am not completely familiar with the interests of the new member at our current universities, or the research at the prospective new SARA members, I am confident that the research will broaden and increase as we add new astronomers to the SARA mix.

III. Telescope Usage.

"All but 4 nights subscribed with observers adjusting to the ACE back-up schedules. The 4 were holidays.

There was much more swapping around including GRB TOO and nights being released and picked up by other observers. Some, but not all, of this was due to the need for experience faculty observers when there are no ROAs.

More split nights than before and I think that is a good sign of our flexibility.

57% usage The other statistics are approximate since not everyone records everything in the nightly reports. But we lost 31 hours with equipment failure vs 308 hours used.

Clouds were the biggest problem as expected with few partial nights closed for wind and humidity."

The telescope is fully subscribed and ROA coverage is adequate, although not as comprehensive as we would like. Every night where there was ROA coverage was allocated for research and nearly all clear nights were used by a SARAn. The new policy that states "seasoned observers can, if the weather conditions are stable and excellent, keep observing even after the ROA has left the mountain" has been used by several observers with great success. This policy has not endangered the telescope nor caused any trauma so we are leaving it intact for the upcoming observing session. Roughly 68% of the scheduled nights were used, a total of 94 out of 139 nights. The nights not scheduled included the August shutdown and nights when no ROAs were available. Forty-five nights were not used due to weather, etc. In all, forty-four nights were affected by clouds, 13 were affected by high winds, and only 11 nights were affected by equipment failure.

IV. Telescope Problems.

No major telescope problems to report. ACE continues to update the software, incorporating more and more "robotic" features. We now control the cameras from the ACE windows, and the weather station is also tied into the ACE software. This allows ACE to pass the telescope location, RA, DEC, JD, ST and filter information into the FITS headers. This also allows us to program the CCD and filters to carry out cyclic

observations, cycling through different filters while recording the filter information into the FITS header. This transition went very smoothly and did not interrupt scientific observations! My kudos goes to Peter Mack and ACE for these upgrades.

V. Instrumentation.

- **Cameras**

    1. The small format AP7 Apogee camera remains a productive camera in spite of the fact that most observers have been experimenting with the U55. The U55 has much shorter readout time, and there were some shutter problems recently reported with the Ap7.

    2. We finally took delivery of the ALTA U55 large format camera from Apogee. The camera has a very large field of view and a very short read-out time. The camera is not without problems. The bias is very high, the gain is seemingly set very low, and there are substantial fringing effects in the IR which do not flat-field out. We are ordering a filter to chop off the IR that is causing fringing. The cooling is not optimal either, reaching only about –24C. I am not a fan of the camera for my observations!

    3. The apogee Ap4 is still serviceable and useable but will not be on the telescope in normal operations.

- **Computing facilities**

    Computers continue to work well. The saraccd computer is set up to run both the Ap7 and the U55 cameras, while saratel remains the telescope computer. Security has been upgraded in the past year and we are considering further VNC upgrades that might provide even better security.

- **Weather Station**

    We had some problems with the wind direction on the weather station, but it appears now to be functioning well. This weather station is great, much better than the previous one. The weather station is accessible from the ACE software and Matt Wood has also connected it to the SARA web site.

- **Auto guider**

The auto guider is on the telescope and is in regular use by observers. The autoguider is connected through the saraccd computer.

- **ISTeC** - The ISTeC web site is no longer up due to a computer crash. Dr. Henson has recently found copies of the web sites and info and was planning to reinstall the

web site using frames. However, if a new member would like to take up the task of managing the web site, Dr. Henson would be amenable to giving it up.

- **REU Program -**

  The REU participants were excellent this year. The talks were like a mini AAS meeting with the high quality of the papers. Great job Matt Wood! This program is a definite success we can all be very proud of. Matt Wood has re-submitted the REU proposal for four more years. Hopefully the NSF will fund it again.

- **ROA's** - Our current group of ROA's are exceptional! Adam Block unfortunately, in the past few days, has notified us he has left NOAO abruptly but is willing to NOAO from Tucson. This is a blow to our ROA corps and hopefully we can resolve this issue in the next few days.

VI. Future.

Here is a list of important action items I feel we need to address in order of urgency.

1. ***Possible SARA expansion.*** Ball State University in Muncie Indiana will be presenting a proposal to join SARA at the September 2005 board meeting. The Ball State group is led by Ron Kaitchuck, Thomas Jordan, and Thomas Robertson. The Agnes Scott group is led by Chris De Pree and Amy Lovell, and hopefully will also submit a proposal at the board meeting. We are excited about the prospects of adding these two schools and look forward to working with our new colleagues. The addition of the money (buy-in) will allow us to investigate a southern hemisphere telescope. In addition to the cash inflow, the most important addition will be the talents and expertise these astronomers bring.

2. ***SARA South.*** If everything goes well with the new members, we can legitimately start preparations for a "SARA south". These are exciting times for the SARA consortium.

3. ***Secondary mirror fabrication and image quality improvements.*** No one has investigated alternative funding for Secondary mirror fabrication. This is a major project and someone who has the time needs to be the driving force behind this project if we really expect developments.

VII. Summary.

In my last summary, I noted that "We are perhaps poised on the brink of a new era for SARA." That "new era" is perhaps here with the possible addition of two new members. Remote observations are still normal operation. Improvements remain to the SARA 0.9-meter at Kitt peak such as thermal control, but the other things like header information is

now fully functional. The SARA observatory remains a fully functional research and teaching observatory!

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