

SARA OBSERVATORY DIRECTOR'S REPORT

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by

*Dr. James R. Webb,
Director, SARA Observatory
Professor of Physics
Florida International University*

I. Introduction.

First off, as is becoming a trend, I would like to welcome Bruce Hirvnaak and Todd Hillwig Valparaiso University as active members of the SARA consortium. SARA is operating every clear night with relatively high efficiency (with a few exceptions that will be discussed below). We have signed the memorandum of understanding with Lowell observatory for access to their 24-inch telescope at CTIO, but we have been slow in getting things going. There are reasons for this, but the upshot is we are behind schedule to get it operational by next summer. I will be more specific below as to the needs for SARA South.

In this intro, however, I want to mention a few things specifically. I was rather vocal about board member participation last time, and am happy to say discussion has improved as a result of the last board meeting. I look forward to continuing discussions on important issues. Secondly, we need to stay cohesive in order to make progress, and not just be satisfied by doing our own thing as far as research is concerned. We also need to insure that our universities abide by their financial commitments. I commend Dieter Hartmann for his efforts on behalf of SARA. I am sure we all feel Clemson is a very important part of our consortium and I am personally delighted he was able to come up with the Clemson dues. Finally, Bruce Rafert of Clemson has inquired about the possibility of us hiring an outside consultant to evaluate the current SARA North system, consortium operation, and the approach to SARA south. This suggestion was discussed briefly at the previous board meeting, but after a "dome close" failure it was recast. While most of us agree an outside, independent look at our operation would be a positive, the problem comes when trying to budget for a reputable outside consultant. The advantages of an outside evaluation are obvious, but what is also obvious are most of the problems the consultant will uncover. As Peter has pointed out repeatedly and I believe we actually budgeted last time, we need to upgrade both the back of the telescope and the computers. We all know the CCD cameras are not good enough for our needs, and finally the thermal control of the telescope should be improved. We have discussed each of these things at previous board meetings. No one has come up with an outside proposal to acquire a top rate CCD camera for SARA North. Until this is done, it is not likely we can buy the camera we need. Thus our primary hurdle is money! We need more expensive CCD cameras, we need to refurbish the back of the telescope, and we need to improve the thermal control. The rational course of action is this: 1) Appoint a board member to inquire about the expense of a suitable consultant. 2) Budget necessary improvement we currently know we need, 3) Budget for SARA south. Lets agree to at

least look into the possibility of a consultant, but make sure it will yield useful information we don't already know.

II. Research at SARA.

We continue to use the SARA telescope every clear night for research and teaching. SARA research consists of projects ranging from binary stars to Blazars. The list below is indicative of the research done at SARA by the member institutions.

- 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 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)
- red dwarf stars (Jordan and Robertson BSU)
- CV Binaries (Kaitchuck BSU)
- Massive Star formation in the Milky Way (Chris De Pree ASU)
- Asteroids and comets (Amy Lovell ASU)

Please continue to submit your publications to Bev Smith at ETSU. Cooperative projects highlight the remotely accessible abilities of SARA and most of all the "extended astronomy department" feeling of the consortium

III. Telescope Usage.

Ron Kaitchuck has taken over the scheduling duties. Thanks Scott Shaw for all your incredible hard work on behalf of the consortium. As Scott retires and UGA leaves SARA, we will certainly miss Scott, his work and his attention to detail. We will miss all our colleagues in Athens as well, but since Scott was one of the founding members of SARA, and one of the most active board members, his presence will be sorely missed.

Previous complaints about observers failing to fill out observation reports have worked, and most observers were very attentive to this duty. Ron and I depend on these reports to keep abreast of telescope usage, telescope and camera problems, and the weather at Kitt Peak.

Operating without an ROA! (Repeated from last report for the convenience of new users) We would like to remind remote observers that without an ROA the weather must be exceptional and that they must be properly qualified to operate in that mode. We recently had a misunderstanding about this issue and it appears prudent that a recap of the important rules here is in order. Note our definition of "Faculty" applies ONLY to Ph. D. astronomers who are faculty at a SARA member institution.

1. New faculty must train either in person or on-line with a qualified SARA faculty member for a minimum of 3 nights, and with an experienced observer on call for another 3 nights.
2. Post Docs must train in person with a qualified SARA faculty member for a minimum of 3 nights and always have an experienced faculty on call.

Must

be “Board approved” to observe without faculty on call.

3. Graduate students must train in person with a qualified faculty member for a minimum of 3 nights. Their faculty advisor may then petition the Board to have them approved as a “qualified observer” who may only observe with an experienced faculty observer always on call.
4. An undergraduate student may NEVER operate SARA alone without a qualified SARA faculty member or other qualified observer present in person.
5. Non - ROA observing – Experienced Faculty (Those having met the training criteria under point 1 above) may observe without an ROA after an additional 3 nights of remote observing (total 6). Non-Sara faculty, Post Docs

Docs

and Graduate students may NEVER observe without an ROA unless they are Board approved. Essentially their faculty advisor must make a strong case for allowing them non-ROA clearance..

For new members, these rules were created over a period of years of operation and seem to work well. Earlier in SARA history, there were absolutely no operations without an ROA, but as we grew more comfortable with the system, we have systematically relaxed our requirements to their current status.

If there is a problem while you are observing the following is the “*Chain of command*” to follow:

1. Consult ROA for weather problems, computer reboots etc. ROAs cannot perform complicated repairs or diagnostic functions.
2. If you are an eligible grad student operating alone, call faculty advisor to report any problem before continuing.
3. If the problem is too severe for the ROA, call the observatory director for a recommendation. I do answer the phone at night, but I do screen calls to if you get the machine, keep talking! If it is before 11:00 MST Peter and Josie Mack have been excellent about responding to a phone call in case of evening-threatening problems. Don’t call for minor problems! If you are unsure as to whether to call Peter, call the observatory director first. We can decide together whether to involve ACE.
4. If you can’t get in contact with anyone, shut down!

The telescope is fully subscribed and ROA coverage is adequate, although not as comprehensive as we would like. Every night when there was ROA coverage was allocated for research and nearly all clear nights were used by a SARAn. The policy of

allowing “seasoned observers to stay open after the ROA has left the mountain” has been used with great success. Only four of the 330 available nights were unclaimed by observers and these nights were holidays.

Last semester, out of the possible 183 days, 112 nights were used to gather observations. Weather was the primary cause for losing nights. Some usable nights might have been lost due to the rules of “experienced observers only” on non-ROA nights, but most were traded off successfully or covered by ACE. Although I could find no record of whole nights lost to equipment failure alone, substantial portions of night were taken up rebooting computers to regain CCD control of filter wheel control. Once again Peter has been very responsive to observer calls and problems, personally logging in remotely and fixing things when observers could not. We should do something nice for Peter for his services in this regard.

IV. Telescope Problems.

Although we have been operating with a fairly high efficiency, there have been numerous reported problems with the SARA computers and communication between computers. It seems like the frequency of the problems have been increasing, but Peter Mack thinks that the problems have been systematic and coincide with the acquisition of the newest CCD camera from Apogee. The interface of this CCD and the MAXIM DL software might be the real problem.

V. Instrumentation.

- **Cameras**

1. Apogee has sent us a new U42 CCD camera to replace the U55 camera. Although the camera is now our primary instrument, and is performing relatively well, it is not the quality of camera we really need to do our science. It appears there is an ongoing communication problem between the camera and MAXIM DL that requires rebooting computers remotely. The new ability to cycle the power remotely has been critical. It has sucked up a lot of observing time however.
2. Finger Lakes camera with SITE chip is our backup camera but it hasn't been used very much lately as our primary camera has been doing well.
3. The apogee Ap4 is still serviceable and usable but will not be on the telescope during normal operations.
4. The status of the low-res spectrograph is unchanged as far as I can tell. Any update Martha?

- **Computing facilities**

Computers continue to work well. The saraccd computer is set up to run both the Ap7 and the U42 cameras, while saratel remains the telescope computer.

- **Weather Station**

The weather station is up and running and appears to be accurate. We would still like to buy “fish-eye lens” camera to aid in determining whether the night is photometric or not. No one has taken action to actually purchase one.

- **Autoguider**

The auto-guider has been functioning adequately, but we really need to refurbish the back of the telescope as per Peter’s suggestions.

- **ISTeC** – nothing has changed from previous board meeting.

- **REU Program** -

New interns, mentors, another great year coming up this summer.

- **ROA's** - Our current group of ROA's are exceptional. I would like to formally thank Elaine, Chuck and Roy for their excellent work. It is always a pleasure to work with them, even though the telescope is operating so efficiently only rarely does there need to be much interaction. Due to the departure of Adam Block, there was a rather severe hole in the ROA coverage. A combination of the new more lenient rules and ACE stepping up and providing ROA services has really lessened the impact of losing Adam. Thanks ACE!

VI. Future.

The future is here! These are some of the challenges we face starting this week and in the near future.

1. ***New SARA North back.*** We need to refurbish the back end of the telescope with the new instrument arrangement. I believe we budgeted for it last time, but we have not arranged it yet. This is a priority as far as I am concerned.
2. ***SARA South CTIO 24-in.*** We need to immediately schedule the dome replacement ASAP. We also need to now schedule Peter to refit the telescope after the dome is replaced.
3. ***Image quality improvements.*** If we do anything here, we need to write a grant to do it.

Air conditioning the dome is a possible way to substantially improve the image quality and is reasonably inexpensive, but will be an increase in the operating costs.

No one has investigated alternative funding for secondary mirror fabrication.

This

is a major project and someone who is interested needs to be the driving force behind this project if we really expect developments. The board should consider hiring an optical expert to evaluate the current SARA 0.9 after the back end replacement and the air conditioning are in place,.

VII. Summary.

We are at a critical stage where we need to take action. Action on the following items:

- 1) refurbishment of SARA north instrument selector
- 2) SARA south dome replacement order
- 3) SARA south automation order with Peter
- 4) SARA North and South CCD camera proposals

I propose we get commitments from board members to tackle each of these action items and set a deadline for it. The longer we wait, the longer it will take to get things done.

Dr. James R. Webb
Director, SARA Observatory
Professor of Physics
Florida International University
Miami, FL 33199
E-mail: Webbj@fiu.edu
Ph: (305) 348-3964.