



SARA NORTH OBSERVATORY DIRECTOR'S REPORT

May 2010

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

I. Introduction.

SARA North is functioning so well we are almost taking it for granted! Aside from a few of the normal problems, things are running as smoothly as they ever have (with the exception of the snow storm). This is a great thing, since most of our effort has been directed toward the SARA South observatory in the past few months. The bottom line, SARA North is now just 1/2 of the SARA observing capabilities.

We are still waiting on the CCD's and spectrographs from the NSF MRI through ETSU. Hopefully the orders will be placed soon, as the new CCD's will be especially welcome at both SARA North and SARA South.

The most excitement we experienced was during the January 19th snowstorm which severely damaged the lower shutter on the SARA dome. The observatory was out of commission for 12 days due to this problem and continuous inclement weather. ACE responded very well to the situation and the telescope was never in real danger. We just couldn't open the dome for a week or so. I want to thank Peter and everyone at ACE for their hard work in welding and repairing the lower shutter and getting the observatory back into operation as soon as was safe. We even observed some nights with an immobile lower shutter, but we were still able to take data. Most of the other technical issues concerned re-booting computers, autoguider problems, or CCD camera issues.

ACE is continuing to do great work for us! Thanks Peter, Josie and all the rest of the ACE staff for their great work.

I also want to thank Chris DePree and Matt Wood for the continuing reworking and revamping of the SARA web pages. ACE also provided us with a detailed observing guide for the first time. Much appreciated!!

II. Research at SARA North

I will take the liberty to spotlight my own research in this issue of the director's report since I don't have anything from others to include. Everyone else has been using SARA North to its full efficiency, but I neglected to ask for input this time around. For instance, during my latest visit to Indiana I spent some time at Butler University and Brian Murphy showed me some impressive observations of planet transits, both with SARA and with their own local telescope. I also know Bill Keel of Alabama is continuing his impressive work on peculiar galaxies, Walter Van Hamme and his collaborator Ron Samec have collected a ton of observations of eclipsing binaries, and several GRB's have been observed at SARA. All of the other institutions are also using SARA North regularly for research and teaching observations.

Blazar Microvariability

The FIU microvariability monitoring program has been in operation since 2008. We have collected hundreds of microvariability curves for our list of 12 highly active Blazars, especially the very interesting near-by BL Lac object 0716+71. These images have all been reduced and the data are organized in XLS files and tested statistically for microvariations. We are working on calculating the duty cycles for microvariability for each object, and searching for correlations between the microvariations and longer term variability.

We organized an international campaign to observe this object continuously over a three day period. We received data from 42 observers in 17 countries and ended up with a 72 hour nearly continuous microvariability light curve. Our SARA North data was extremely important to the observation. Other SARA schools also contributed observations using their home institution telescopes. The analysis of this unprecedented light curve is continuing, and is currently being written up for publication, but the bottom line is the SARA North observatory made it all possible and anchored the observations in a very significant way.

Out of these observations, we finally see a picture emerging on the nature of the microvariations. Stay tuned as we work on the papers that will report these exciting results!

III. Telescope Usage.

With the exception of a few major problems, the telescope, operating system and cameras have been operating at a high level of efficiency. There were a total of 130 nights reported, but unfortunately ***68 nights do not have observing reports on file (34%)***. We need to do much better than this. A large number of those were due to extended down time, but we still should submit reports if we are scheduled for that night. We might want to consider a penalty for observers who frequently do not submit reports.

Using the reports that were filed, data was collected on **86** of the **130** (66%) reported nights (about 690 hours). About **550** hours were lost to weather and **98.5** hours were lost due to technical problems. Of the nights lost due to technical problems, most of those

were due to the lower shutter problem. So by far, weather was the largest factor in not obtaining data.

IV. Telescope Problems.

The major problem was the lower shutter which was damaged in the windstorm. A variety of connection issues and reboot issues were tackled by ACE, but in general, these issues were not substantial in the final analysis.

V. Instrumentation.

- **Cameras**

1. The U42 came back better than ever. The cooler is much better allowing us to cool the CCD to a much lower temperature (-35 to -40C). The decrease in thermal background and the increase in light throughput due to the removal of the tertiary mirror led to a much more sensitive system. Personally, I found I had to reduce exposure times by 25% to avoid over exposure of comparison stars.
2. Finger Lakes camera was sent to Chile as the primary CCD there, but failed to work properly. So, currently the FLI is dead and needs to be either scrapped or sent to the factory for repair. The end result is that we have no backup camera for either SARA North or SARA South.
3. We are currently in the process of ordering a new Bob Leach CCD camera as well as an ACE spectrograph for both the SARA north and SARA south observatories. The new cameras will be the prime instruments and we will keep the U42 as a back-up for SARA North and the Finger Lakes as a backup for SARA South. The details concerning the CCDs will be discussed at the board meeting.

- **Computing facilities**

No changes from previous systems.

- **Weather Station**

The weather station is currently working well.

- **All Sky Camera-** The all-sky camera has been functioning well. It is very nice to be able to see the sky while observing. It would be nice to be able to set it to automatically update, but frankly that would be shutter wear and tear when it is not really necessary, so in my opinion it is fine the way it is. **OBSERVING NOTE:** Occasionally it does refuse to operate, and it is necessary to go to the ACE computer, open an internet browser window, click on favorites and open the “APC_rack_PDU”

web site. From there you can cycle the power on and off for the all-sky camera and it usually comes back up. This is a common thing that some observers do not know!

- **Dome Cameras -** The cameras are situated well and are very helpful.
- **SARA North ROA's –** We finally have an ROA-MOU in place and ROA operations are working as usual.

VII. Future.

These are some of the challenges we face starting this week and in the near future. We need to at some stage replace the slip rings and rollers in the SARA North dome. This should wait until summer shutdown.

VIII. Summary.

The success of the MRI grant, the nearing completion of the SARA south telescope, and the hopefully successful negotiations concerning the ROAs make for a bright future for SARA observers!

*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.*