
News from our Alumni
Roy Kilgard, University of Leicester, and
Ken Rumstay, VSU

This summer we heard from two alumni who participated in the SARA REU program during our first year of operation in 1995. Roy Kilgard received his undergraduate degree in astronomy from Valdosta State University in 1997, and was one of VSU's most outstanding majors. He spent the summer of 1995 studying quasars with Jim Webb of Florida International University. Roy writes:

"In the more than eight years since my SARA REU experience in the summer of '95, I have pursued a number of different projects in astronomy ranging in wavelength from radio to X-ray and in telescope aperture from four inches to eight meters. I received a B.S. degree in astronomy from Valdosta State University in June 1997 and went to work at the Harvard-Smithsonian Center for Astrophysics as a research assistant on the Chandra X-ray Observatory (then called AXAF). After three years of answering questions from irate Chandra users, I transitioned to a research-oriented position, analyzing Chandra observations of nearby galaxies. A year later, in the autumn of 2001, I took this project with me to the University of Leicester in England where it has become the center-point of my Ph.D. thesis. My work concentrates on the discrete X-ray source populations of nearby galaxies and what they can tell us about (1) X-ray binary formation in nearby galaxies and (2) the star-formation history of the local universe. I divide my time between Leicester and the CfA, thus allowing me to keep up active collaborations with people on both sides of the Atlantic and to stay up to date on both Chandra and XMM-Newton. I expect to complete my Ph.D. in October 2004. The SARA REU program was my first step into the world of professional astronomy and it helped me to understand what it really means to perform high-quality scientific research. It also taught me a healthy fear of IRAF!"

Roy is scheduled to present a paper at the January AAS meeting, and we look forward to seeing him again in person.

Also participating that year was Allison Morrill, a Space Sciences major at Florida Tech. She has since married, changing her last name to Hall, and now lives in the Atlanta area. In January she gave birth to son Nathaneal. We were pleased to have Allison and Nathaneal, and husband Chris, join us for dinner during our June REU meeting in Athens. It was a pleasure to see her again after so many years!



Roy Kilgard, now a graduate student at the University of Leicester, was Jim Webb's first REU student. (Photo by Roy Kilgard)



Allison Hall (*nee* Morrill) and her newborn son Nathaneal joined us at the first REU meeting at the University of Georgia. Allison, a graduate of the Florida Institute of Technology, participated in the SARA REU program during its first year of operation in 1995. She was also my first REU student! (Photo by Ken Rumstay)

SARA Observatory Newsletter
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Kenneth S. Rumstay, Editor

The SARA web page is www.saraobservatory.org
This newsletter is available as an electronic PDF file

For paper copies, comments, questions or contributions,
Please contact the editor at krumstay@valdosta.edu

The Pisgah Astronomical Research Institute Ken Rumstay, VSU

Enroute to the September board meeting at ETSU, SARA board members paid a brief visit to the Pisgah Astronomical Research Institute (PARI). Nestled in the mountains of western North Carolina, PARI is a nonprofit public foundation whose mission is to provide research and educational access to radio and optical observational facilities to a broad cross-section of users. Dr. Michael Castelaz, a former ETSU faculty member who was for many years SARA's Observatory Director, currently serves as PARI's Director of Astronomical Studies and Education.

PARI started life as the Rosman Research Station, which was a NASA facility used during the 1960's and 1970's for tracking manned and unmanned space flights. In 1981 the facility was transferred to the Department of Defense for use as an intelligence gathering facility; its twin 26-m radio dishes were originally designed for satellite communication purposes. The facility maintains its Cold War mystique; visiting school children are often heard to ask "Where are all the spies?" In 1995 the Department of Defense closed the facility, and turned the site over to the U.S. Forest Service. In 1999, the site was purchased from the U.S. Forest Service by Don Cline, President of PARI, for use as an astronomical research and educational facility.

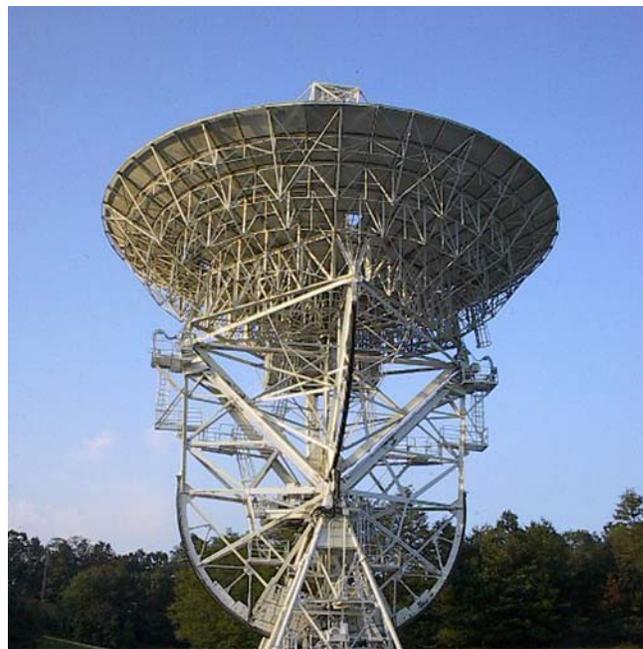
In addition to offering radio and optical research facilities to visiting astronomers, PARI regularly offers a wide variety of workshops for teachers and for college and high school students. Students also conduct research projects at PARI on an individual basis, and professional astronomers have spent sabbaticals there. A STARLAB portable planetarium is used by PARI astronomers to present astronomical programs at nearby schoolsystems. SGRA, the School of Galactic Radio Astronomy, is a particularly innovative experiment in education. Taking its name from Sagittarius A, the radio source at the galactic center, SGRA is an experience-based school room (reliant on Internet access to the PARI radio telescope) for regional use by elementary, middle, and high school teachers and their students.

In October PARI initiated a partnership with UNC at Asheville when officials from the two institutions announced the formation of PARSEC, the Pisgah Astronomical Research, Science and Educational Center. These centers are established by the University of North Carolina system within their campuses to foster multidisciplinary programs of research and public outreach. PARI also recently received a \$249,000 grant from the National Science Foundation to develop a multimedia planetarium presentation on the radio universe.

As our first Observatory Director a decade ago Mike Castelaz oversaw construction of the SARA observatory at Kitt Peak; now he is doing great things for PARI! We thoroughly enjoyed our visit, and look forward to returning soon. For more information about PARI visit their website at www.pari.edu.



Former SARA Director Mike Castelaz demonstrates the radio telescope control room. (Photo by Ken Rumstay)



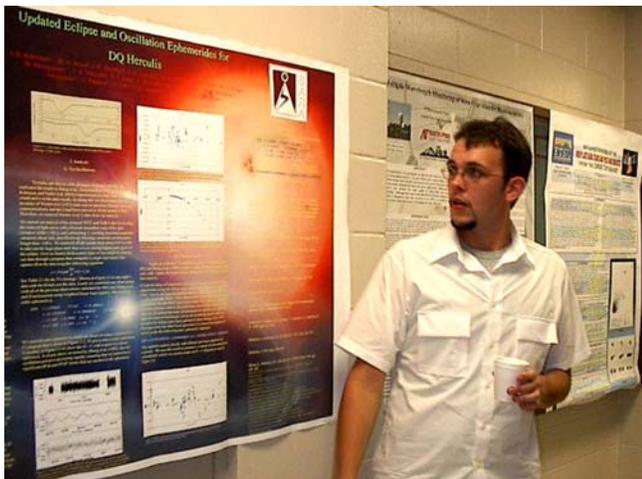
One of two 26-m radio dishes at PAR, originally designed to track low-altitude artificial satellites. (Photo by Ken Rumstay)



Dome housing a 0.3-m Meade optical telescope, used for CCD imaging. (Photo by Ken Rumstay)



After nights spent observing the heavens, Stephanie Cortes explores the caves at the Tucson Desert Museum. (Photo by Ken Rumstay)

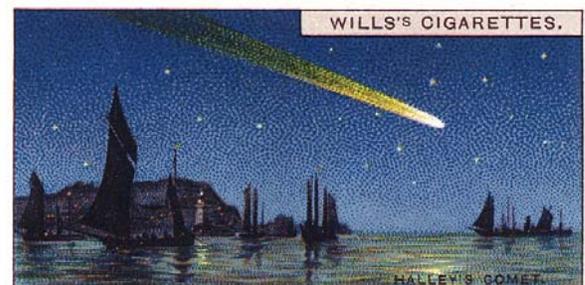
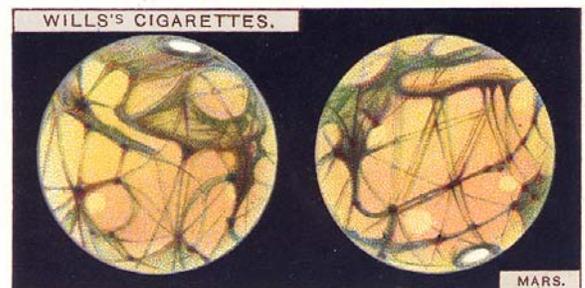
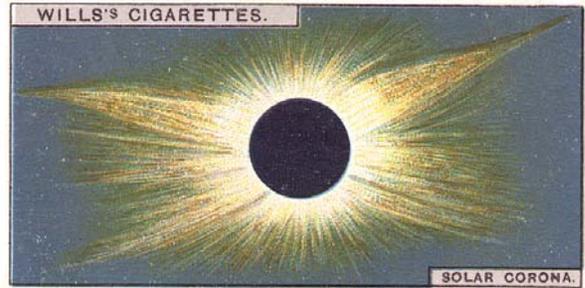


John Robertson describes his research on the eclipsing binary system DQ Herculis during the poster session. (Photo by Ken Rumstay)



Sarah seems to be enjoying the airboat ride! (Photo by Ken Rumstay)

Astronomy in our Culture Ken Rumstay, VSU



Although not widely collected today, during the first half of the twentieth century cigarette cards were very popular. In 1928 the Wills's Cigarette Company of Bristol, England produced a beautiful set of fifty cards entitled Romance of the Heavens. Five examples of these cards are illustrated above.

2003 SARA-REU Participants

Name	Home Institution	Faculty Mentor
Roggie H. Boone	Valdosta State University	Dr. Cecilia Barnbaum (VSU)
	<i>U Equulei: A Photometric and Spectroscopic Anomaly</i>	
Stephanie R. Cortes	Clemson University	Dr. Jeremy R. King (CU)
	<i>Blue Metal-Poor Stars: A Search for Periodicity</i>	
Sarah E. Eyermann	University of Missouri at Rolla	Dr. Kenneth S. Rumstay (VSU)
	<i>New and Revised Magnitudes for Stars Within Four Arcminutes of Selected Active Galaxies</i>	
Cece H. Hedrick	University of Nebraska at Lincoln	Dr. J. Scott Shaw (UGA)
	<i>Variable Star Madness: Mining the OGLE Database</i>	
Leigh A. Korbel	Buffalo State College	Dr. James R. Webb (FIU)
	<i>Correlating Short-Term Variability and Microvariability in the Blazars 3C-279 and 3C-446</i>	
Moshe Molcho	Los Angeles City College	Dr. Walter V. van Hamme (FIU)
	<i>Transiting Extrasolar Planets in the OGLE Database</i>	
Stuart J. Robbins	Case Western Reserve University	Dr. Bradley S. Meyer (CU)
	<i>Modeling Nucleosynthesis: Web-Based Tools</i>	
John R. Robertson	Appalachian State University	Dr. Matthew A. Wood (FIT)
	<i>Updated Eclipse and Oscillation Ephemerides for DQ Herculis</i>	
Twyla G. Smith	East Tennessee State University	Dr. Donald G. Luttermoser (ETSU)
	<i>Fluorescent Clues to the Atmospheric Structure of AGB Stars: Data Analysis of IUE Spectra</i>	
William K. Teets	Austin Peay State University	Dr. Gary D. Henson (ETSU)
	<i>Multiple-Wavelength Monitoring of Mira-Type Stars for Microvariability</i>	
Elizabeth A. Wennerstrom	Rhodes College	Dr. Terry D. Oswalt (FIT)
	<i>The Quest for Variability</i>	
Rachel I. Baker*	East Tennessee State University	Dr. Beverly Smith (ETSU)
	<i>Infrared Variability of Very Late AGB Stars and Post-AGB Objects from the DIRBE Database</i>	
Tamalyn Heinz*	Florida Institute of Technology	Dr. Terry D. Oswalt (FIT)
	<i>A Further Look at the Extrasolar Planet System HD 209458: What Other Mysteries Remain?</i>	
Stephanie Rafferty*	Florida Institute of Technology	Dr. Terry D. Oswalt (FIT)
	<i>HS1136+6646" Photometric Time Series on a DAO/dK6 Binary System</i>	

*Non-REU students supported by other funding sources



The 2003 SARA REU students and mentors pose for a group photo on the pier at the Lone Cabbage Fish Camp. (Photo by Matt Wood)

The 2003 SARA REU Program

Ken Rumstay, VSU

During the summer SARA operated its ninth Research Experiences for Undergraduates program. Sponsored by the National Science Foundation (grant AST-0097616), this program brings talented undergraduates from around the country to the six SARA institutions for a summer of astronomical research.

As in previous years our project director Matt Wood sent over 3000 flyers to virtually every college and university science department in the country. Eleven highly gifted students were selected from a pool of over one hundred applicants. Two additional students from Florida Tech, and one from ETSU, were supported by other funding sources and participated in REU activities. As the table shows, these individuals conducted a wide variety of research projects during their time on the SARA campuses.

Our program began with a group meeting held on May 30th and 31st at the University of Georgia in Athens. This first gathering is intended to provide an opportunity for everyone to become acquainted. Faculty mentors present brief overviews of their research, and students are given advice regarding research ethics, scientific paper preparation, and professional conduct. We also enjoyed a variety of social activities, concluding with a dinner party at the home of Scott and Beth Shaw.

After returning to the various SARA schools, most of each student's waking hours for the next several weeks were devoted to research. Their project titles, presented in the table on the facing page; indicate the wide range of interests among the SARA faculty. Projects were observational (in several wavelength ranges), theoretical, and computational in nature. All students however traveled to Kitt Peak to gain observational experience with the SARA 0.9-m telescope. This trip is the highlight of the program for most students!

The second workshop was held August 1st and 2nd on the campus of the Florida Institute of Technology in Melbourne. Each student presented his or her research in two formats, representative of the ways in which research is presented at professional scientific meetings. On Friday each student gave a fifteen minute oral presentation. All seemed well-versed in current technology; for the first time every one of our students prepared a PowerPoint presentation! Saturday morning was devoted to a poster session. The posters were for the most part of outstanding quality, and many will be presented again at the next meeting of the American Astronomical Society. The meeting ended with a party at the home of Matt and Diane Wood.

On August 3rd we all headed home (stopping enroute to visit the Kennedy Space Center), and the students soon after returned to their academic institutions. But we'll see many of them again soon! Several will be presenting their research at the January AAS meeting in Atlanta. Readers are invited to meet our students at their posters (sessions 4.12, 8.03, 9.01, 54.03, 54.04, 55.05, 57.05, and 83.05).



REU students and mentors listen attentively during the first group meeting at the University of Georgia. (Photo by Ken Rumstay)



Elizabeth, Tamalyn, and Steffanie describe their observing run at the SARA observatory. (Photo by Ken Rumstay)



Roggie prepares to go aloft to seal a minor leak in the dome of the SARA observatory. (Photo by Ken Rumstay)

Observatory Director's Report (Summary)

James Webb, FIU

I. Introduction

It is a pleasure to say that observing at SARA has become routine for all of us. A large number of observers are now observing from home over DSL or cable modem lines. Although there are features we would still like to see implemented, we have a very productive observatory as is.

II. Research at SARA

Research continues to thrive at SARA; a partial record of accomplishments can be seen on the SARA web page. This year alone at least three multi-year NSF proposals were funded based on SARA data. Targets of observation ranged from asteroids to gamma-ray bursts, binary systems to cool stars, and white dwarfs to quasars.

III. Telescope Usage

The telescope is fully subscribed and ROA coverage is adequate. A rough average of twenty-eight nights per month were scheduled since April (save for the August shutdown).

IV. Telescope Problems

The majority of problems with the telescope have been minor, and were almost immediately fixed by ACE. The tracking problems have become inconsequential since the autoguider came online. The telescope continues to have pointing problems; it is consistently off in right ascension and slightly off in declination. Peter Mack needs to make new observations to improve the pointing model, since the telescope balance has drastically changed during the August engineering time.

The ACE telescope operating system is still not communicating with the MaximDL software, thus much of the pointing and filter information is not automatically

placed into the fits header. We hope to remedy this situation in the coming months.

V. Instrumentation

The AP7 Apogee camera remains the workhorse of the observatory. An order for a large-format CCD was placed nearly fifteen months ago, but the camera has yet to be delivered.

As a result of attempts to "hack" into the saratel and saraccd computers, Peter has installed a new firewall to supplement the previously installed KPNO firewall. During the August shutdown saratel had to be reloaded; sarccd was updated and the disk wiped clean. No data was lost in the process.

The weather station is unfortunately not working as a result of lightning strikes which fried the control board. Peter contacted the company we bought it from; apparently it cannot be refurbished. Cheaper models are now available; we need to investigate these and purchase a new one.

The autoguider is on the telescope and is in regular use by observers. It works beautifully!

VI. The Future.

Here is a list of important action items we need to address:

- 1) Take delivery on the wide-field CCD camera.
- 2) Replace the weather station.
- 3) Fabricate a new secondary mirror, or take other suggested measures to improve image quality.

VII. SUMMARY

In summary, this has been another great summer and fall for SARA. We took full advantage of the August shutdown and made some necessary improvements to the telescope control system. We still await acquisition of a large-format CCD camera, and replacement of the weather station is a pressing necessity.

Submitted 2003 September 26



A panoramic view of the Kitt Peak National Observatory, as seen from the catwalk of the 4-meter telescope. (Photo by Stuart Robbins)

The Autumn 2003 Board Meeting Gary Henson (ETSU) and Ken Rumstay, VSU

The Autumn 2003 meeting of the SARA Board of Directors was held September 26th on the campus of East Tennessee State University. After the minutes of the March 28th board meeting were approved, Observatory Director Jim Webb reported on the status of the 0.9-m telescope facility at Kitt Peak. His report is summarized on page three of this issue.

Next on the agenda was allocation of telescope time for the period October 2003 to April 2004. Now that remote observing is a routine matter, and more remote observing assistants have been added to the roster, the telescope is completely subscribed. The telescope allocation process is characterized by some haggling and compromise, but invariably ends with everyone reasonably happy!

Then followed the most time-consuming task on the agenda: setting our budget for the next fiscal year. SARA operates on an annual budget of roughly \$50k per year; these funds come from annual dues paid by each member institution. Most of our fiscal resources each year are devoted to expenses associated with operating the 0.9-m telescope at Kitt Peak; about 10% of the budget is used to support faculty mentors in our summer REU program. Terry suggested that Richard Green, director of KPNO, seemed more willing to provide various services to tenants than had been the case; we should investigate what services might be of use to us, and analyze the relative costs and benefits.

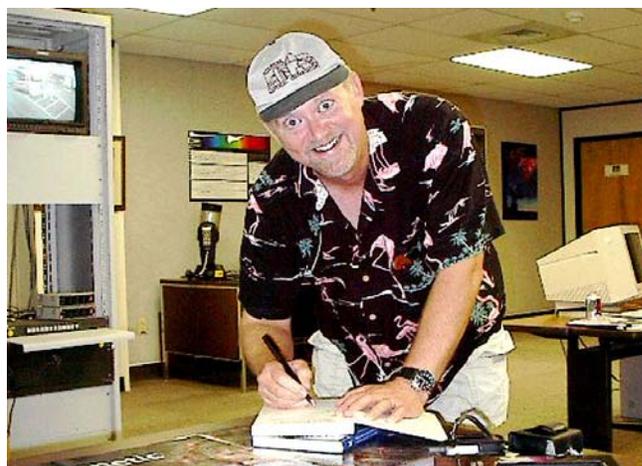
After an elegant luncheon in the President's Dining Room, discussion turned to a variety of issues. Matt Wood summarized the summer's REU program; he estimated that perhaps half of the student participants would be presenting papers at the January AAS meeting. Gary Henson gave a status report on ISTeC, the International Small Telescope Consortium. The Board then discussed the new SARA video; progress on this had been stalled for several months. The planned thirty-minute video will now be produced by Remnant Digital Productions, at an estimated cost of \$3000 to \$4000. SARA board members were enjoined to provide video and still shots for incorporation into this project.

A final item for discussion was the special session, to be hosted by SARA, at the January AAS meeting in Atlanta. Session 100, *Research at Predominantly Undergraduate Institutions*, is scheduled for 10:00 am on Wednesday, January 7th. The session include presentations by a panel of five individuals, followed by an open discussion period. The panelists are Matt Wood (representing SARA), Leslie Brown (Connecticut College), Dan Caton (Appalachian State University), Kathy DeGioia Eastwood (Northern Arizona University), and Ed Guinan (Villanova University).

The day concluded with a lovely Mexican dinner at the home of Gary Henson; we are most grateful to Gary and his wife for their hospitality! The next meeting of the SARA Board of Directors is scheduled for March 26, 2004 at Florida International University in Miami.



Dieter, Gary and Terry converse with Dr. Harry Powell, semi-retired Professor of Physics at ETSU. (Photo by Ken Rumstay)



Terry Oswald signs a copy of *The Future of Small Telescopes in the New Millennium*, a three-volume work which he edited for Kluwer Academic Press. (Photo by Ken Rumstay)



Jim Webb has just released a new CD entitled *Time in the Tropics*. Here Jim signs CDs at the September board meeting at East Tennessee State University. (Photo by Ken Rumstay)



SARA OBSERVATORY NEWSLETTER

Issue #8

Autumn 2003

Florida Institute of Technology
East Tennessee State University

University of Georgia
Valdosta State University

Florida International University
Clemson University

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From the Editor's Desk

Ken Rumstay, VSU

Autumnal greetings to one and all! As I write this 2003 is drawing to a close, and it's been a productive year for the Southeastern Association for Research in Astronomy. The SARA telescope has been used on nearly every clear night to gather data on celestial objects ranging from nearby asteroids to distant quasars. A new video is in production; this should prove an invaluable tool in publicizing SARA and its goals. We enjoyed another highly successful summer REU program, and I look forward to being reunited with many of our summer students at next January's meeting of the American Astronomical Society in Atlanta. At that meeting SARA will, on January 7th, host a session entitled *Research at Predominantly Undergraduate Institutions*. The January meeting is relatively close to home, and we expect SARA to be well represented!

A number of astronomical events made headlines during the past year. On the evening of March 29th one of the brightest gamma ray bursters ever observed appeared in Leo. Its afterglow was monitored by astronomers around the world, including Clemson University's Dieter Hartmann using the SARA telescope at Kitt Peak. While the maximum luminosity of GRB 030329 remains unknown, it may have reached naked-eye brightness for west coast observers! This event helped confirm the prevailing theory that gamma ray bursters are linked to supernova explosions and the collapse of stellar cores into black holes.

At 5:46 am EDT on August 27th Mars passed closer to Earth than at any time in recorded history. While of perhaps limited scientific value, for the general public this was unquestionably the astronomical event of the year! At the six SARA schools a number of public lectures and viewing sessions conveyed the excitement of astronomy to an audience of thousands. At the close of the year Mars still blazes in our evening sky, joined by brilliant Venus in the west and by Saturn and Jupiter in the east.

Speaking of Saturn, this New Year's Eve the ringed planet will reach opposition and will in fact be closer to Earth than it has in a quarter century! I for one look forward to resuming classes in a few weeks, when the four brightest planets will be arrayed in our night sky for the enjoyment and enlightenment of my students. Best wishes to all our readers for an auspicious New Year!



Spiral galaxy M101 in Ursa Major, imaged 2002 June 20 with the SARA telescope. (Image by Martha Leake and Sarah McGregor)



The planet Jupiter shines above the SARA observatory atop Kitt Peak during the early summer. (Photo by William Teets)