



News from The Society for Astronomical Sciences

Vol. 8, Number 1

The 2010 Joint SAS/CBA Symposium: Final stages of Preparation

The final planning for this years Symposium is underway. On pages 2-3 you can see the tentative schedule of speakers. As in the past workshops will be offered. For this meeting they will be on Tuesday May 11th.

Olivier Thizy: Practical Aspects of Spectroscopy. He is the president of Shelyak Instruments, manufacturer of various spectrometers. This workshop will be in two parts. First, using IRIS and VisualSpec, participants will measure the temperature of stars using low resolution spectra, then using VisualSpec they will measure line profiles in a high resolution spectrum and determine their astrophysical meaning.

Richard Berry: The Calibration of a CCD Camera. Richard is the co-author of the popular image processing book and software, *The Handbook of Astronomical Image Processing*. This will be a hands on workshop with the participants split into five groups. One person in each group will be asked to bring his CCD camera and control computer to be used by the group. Controlled light sources will be provided to each group for these measurements.

The combined symposium will include many papers related to cataclysmic variables as well as asteroids, exoplanets, supernovae gamma ray bursts and much more. As always emphasis is on amateur research and amateur-professional collaboration with amateurs and professionals discussing the issues around CCD

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Chris Butler to deliver the Keynote address this year



John Christopher "Chris" Butler is an internationally renowned artist and public speaker whose work focuses on astronomy, nature, and maritime subjects. His illustrations are done with a passionate attention to accuracy and fine detail, and have appeared in thousands of publications worldwide. Chris's sensitive integration of nature and the universe in

his paintings portrays the harmony of the universe through unique perspectives that stimulate the imagination very effectively.

A captivating speaker, Chris is widely in demand for his insightful and entertaining lectures on astronomical and other topics, illustrated with his own art. Chris's unique art and presentation style reflects his diverse experience; he currently serves as a senior art director for planetarium and exhibit programs for the Griffith Observatory in Los Angeles. He has been the director of a children's science museum, a tour guide on the Queen Mary, a technical illustrator, a representative for a telescope manufacturer, an amateur astronomer, and a financial analyst on the space shuttle program.

Chris also has the distinction of having an asteroid named in his honor - 13543 Butler. He resides with his family in Buena

Committee:

- Lee Snyder – Co-Chairman
- Robert Stephens – Co-Chairman
- Robert Gill – Audio Visual Webmaster
- Dale Mais – Program Co-Chairman, Newsletter editor
- Brian Warner – Program Co-Chairman
- Jerry Foote – Program Co-Chairman
- Robert Buchheim – Program Committee

Advisors:

- Arne Henden
- Dirk Terrell

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*News from The Society
for Astronomical
Sciences*

Bob Buchheim joins SAS Committee

We are pleased to welcome Mr. Robert K. ("Bob") Buchheim to the SAS Committee. At the December 9, 2009 meeting of the Committee, he accepted the nomination to join the leadership of SAS. He will support the Program Com-

mittee and will be involved in some related special projects.

Many of you probably recognize Bob as an enthusiastic participant and presenter at our annual Symposia. He has published reports on asteroid light-curves, visual double stars, and asteroid occultations based on projects done at "Altimira Observatory" (in his backyard).

He is the author of 'The Sky Is Your Laboratory', a lab manual for small telescope astronomical research activities, and is also the Secretary of the Orange County Astronomers. He holds a BS in Physics from Arizona State University, and is a graduate of the Defense Systems Management College and the UCLA Executive Management Program. He lives with his wife (Eileen) and two cats (Archimedes and Cleopatra) in southern California.

SCHEDULE FOR SAS 2010

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Wednesday 5/12				
Coffee/Registration		8:00	8:45	
Welcome		8:45	9:00	
Robert Stencel	Epsilon Aurigae in Total Eclipse 2010: A Progress Report	9:00	9:30	
Jeff Hopkins, Robin Leadbeater, et al.	Epsilon Aurigae Eclipse 2009: Ingress	9:30	10:00	
Gary Billings	Rapid Cadence Monitoring of Epsilon Aurigae	10:00	10:30	
Coffee Break		10:30	10:45	15 MINUTES
Gary Cole	Developing a Polarimeter to Support the Epsilon Aurigae Campaign	10:45	11:15	
Lance Benner	Radar Observations of Asteroids	11:15	12:00	
Lunch		12:00	13:30	90 MINUTES
Alan W. Harris	Update on Asteroid Research and Opportunities	13:30	14:00	
Aaron Price, Arne Henden, Mike Simonsen	The First Decadal Survey of Amateur Astronomy and Astrophysics	14:00	14:30	
Thomas C. Smith, Arne Henden, Dirk Terrell	AAVSO Photometric All-Sky Survey Implementation at DRO	14:30	15:00	
Coffee		15:00	15:15	15 MINUTES
Jerry Horne	Examining ROTSE RRc Lyra Variables	15:15	15:45	
Doug Walker	Introducing Astronomy Related Research into Non-Astronomy Courses	15:45	16:15	
Joe Patterson	Cataclysmic Variables and the CBA	16:15	16:45	
Sponsor Infomercials		16:45	17:15	Sponsors Infomercials
Thursday 5/13				
Coffee		8:00	8:30	
John Menke	Here Today, Gone Tomorrow: Pursuing the U Sco Outburst	8:30	9:00	
Bob Koff	Unusual Behavior of the Cataclysmic Variable TT Ari	9:00	9:30	
Mike Simonsen	The Z CamPaig	9:30	10:00	
Olivier Thizzy	Classical Be Stars	10:00	10:30	
Coffee		10:30	10:45	15 MINUTES
Scott Degenhardt	Io and Europa Atmosphere Detection through Jovian Mutual Events	10:45	11:15	
Robert Buchheim	Asteroid Phase Curves at Altimira Observatory	11:15	11:45	



*News from The Society
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Thursday, Continued

Group Photo		11:45	12:00	
Lunch		12:00	13:30	90 MINUTES
Poster Papers / Meet & Greet		13:30	14:00	
Russell Genet, Arne Henden, Bruce Holenstein	Light Bucket Astronomy	14:00	14:30	
Wayne Green	Asynchronous Meteor Observations	14:30	15:00	
Coffee		15:00	15:15	15 MINUTES
Rodney Howe, Iakovos Marios Strikis	Imaging Dense Globular Clusters Like M3 and M15	15:15	15:45	
Ralph Menga, Robert D. Stephens	Meteors R Us	15:45	16:15	
		16:15	16:30	Closing Remarks
Dinner		17:30		
Keynote Speaker				
Chris Butler	Our Little Corner of the Milky Way	19:00	20:00	

Membership Information

Membership in your new Society for Astronomical Sciences (SAS).

As was pointed out with the last issue, it was felt that a modest membership fee would greatly help SAS to produce a better product for its members. This fee will be \$25.00 per year. What will this membership fee provide? Well for one thing it WILL NOT go to any committee members as part of their efforts within SAS. We volunteer our time for The Society.

Members will receive a discount for the registration fee each year for the Symposium at Big Bear. It will assure you that you will get a copy of the published proceedings each year, even if you do not attend the Symposium. It will help defray costs in bringing in outside speakers (professionals) to the symposium.

Membership is annual and runs from

July to June of the following year. To become a member, send \$25 to: Society for Astronomical Sciences, 8300 Utica Avenue, Suite 105, Rancho Cucamonga, CA 91730. You may also join online at the registration page of the web site. Membership dues are tax deductible.

The SAS is a 501(c)(3) charitable organization.

Your Participation Wanted!

As I have mentioned in previous Newsletters, we need your participation in the Newsletter. We don't want this to become a one person or just a couple person show. If you have an article which can cover a variety of topics, please put it together for a future Newsletter. Work in progress is always welcome. In addition, we have started a "letters to the Editor" section where we would like to add 2-3 letters from the members/participants. We had no letters to incorporate into this Newsletter edition. Con-

structive comments are always welcome as we are always looking for ways to improve not only the quality of the Newsletter but also the quality of the Symposium. We want the SAS to become a year around organization not just a once a year group.

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camera use, software and the latest techniques in data acquisition and analysis. If you want to learn more about photometry, astrometry, spectroscopy or CCD imaging along with the news on hardware and software techniques, this is a must meeting for you!

Contact Us:
8300 Utica Avenue, Suite 105
Rancho Cucamonga, CA 91730

Email:
Lee Snyder: lsnyder@socastrosci.com
Robert Stephens:
rstephens@socastrosci.com
Dale Mais: dmais@socastrosci.com
Newsletter Editor

Douglas S. Hall

Jeff Hopkins



Introduction

June 2010 marks the 30th anniversary of the IAPPP. It is fitting to present a brief article on how it all got started and the man responsible, Douglas S. Hall.

Doug Hall has been responsible for getting many interested people started with astronomical photometry. This began in the late 1970's back before the Internet, CCD cameras or even personal computers. Many people interested in astronomy and wanting to make a contribution found it nearly impossible to do so. Any contribution seemed to require a major observatory, a dark sky location and very expensive equipment. Doug showed that even a backyard amateur astronomer with modest and inexpensive equipment could make significant scientific contributions to astronomy by doing photoelectric photometry. Doug has been an inspiration to hundreds. Through collaboration between the new photometrists and professional astronomers hundreds of peer reviewed papers have been published in prestigious astronomical publications with the amateurs as authors and co-authors.

In the Beginning

I had read about amateurs making important contributions to astronomy by observing variable stars. All that was needed was an optical aid, e.g., binoculars or a modest telescope. The Ameri-

can Association of Variable Star Observers is devoted to just this. The AAVSO has star charts to help observers find and estimate a star's brightness changes by comparing the star to non-varying neighbor stars. There are many amateurs around the world doing this. They have contributed much to the understanding of variable stars. While this was certainly an option, I didn't like the idea of estimating. It seemed to me very imprecise, too subjective for me. While I heard some seasoned observers were very good at estimating magnitudes, I decided that was really not for me. Still, variable stars were interesting.

The February 1979 issue of *Sky & Telescope* offered another interesting option. (See page 5 of Newsletter) The article on RS CVn stars, binary star systems with stars that have giant star spots, caught my attention. While the star systems are interesting the idea of doing photoelectric photometry intrigued me. Here was a chance to do useful and objective astronomy in my backyard with a modest telescope and even with bright skies of Phoenix. I liked the idea of being able to measure starlight to a high precision and not rely on my judgment.

I contacted Doug Hall and my journey into photoelectric photometry began. Doug put me in contact with Russ Genet. Between Doug and Russ their efforts created an organization to help amateurs and smaller observatories get started with photoelectric photometry.

The organization, called *International Amateur-Professional Photoelectric Photometry* (I.A.P.P.P.) was formed in June 1980 in Fairborn, Ohio by Douglas S. Hall and Russell M. Genet. The first I.A.P.P.P. Symposium was held at that time. The proceedings of that Symposium, which was held at the Fairborn Observatory and the Apollo Observatory in the Dayton Museum of Natural History, were published as issue No. 1 of the *I.A.P.P.P. Communications*.

Two major items resulted from the formation of the IAPPP, the periodic publications called the *Communication*. and the yearly IAPPP Symposiums. Nearly 100 of the *Communications* have been published.

The Communications

Below is an image of the front cover of the first issue of the *Communications*.

The *Communications* was published approximately quarterly. Any member could submit their work for publication.



Articles included observational projects, equipment designs and review, techniques, software and other related topics. This has been a huge effort for Doug and several editors.

Symposiums

The yearly symposium allowed the meeting of those interested in photometry and allowed them to present papers, give demonstrations and hold workshops. With the help of Doug, Russ and The Reverend Donald Roe, I was instrumental in organizing the first IAPPP Symposium held at Camp Oaks, Big Bear Lake, California in May of 1982. That symposium and offshoots (including SAS) have been held each May nearly continuously since.

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Web Site

In June of 2005 I contacted Doug and we discussed having me setting up a web site for IAPPP information. While mostly for historical purposes it does have a lot of information regarding the IAPPP. The URL is www.IAPPP.com. I encourage those interested to explore the site. It may give you a better appreciation of how we got where we are today.

Equipment

Now days you can purchase various types of photometers and CCD cameras for use in doing photometry. In the early 1980's one was pretty much left to make their own equipment. While not really very difficult, it was said one needed to make at least 3 photometers before settling on one that was satisfactory. Most were photomultiplier tube based (1P21) photometers. You had to search for glass filters and usually ended up cutting your own. For readout, at first there were analog meters to read current or voltage level representing a brightness. Then chart recorders offered a permanent record at the expense of a lot of chart paper. The biggest improvement came when a company called LeCroy came out with an integrated circuit called MVL100. For around \$20 the output of the photomultiplier tube could be amplified and conditioned to provide an actual count of photons. This was a big advance for photoelectric photometry. Personal computers were still a bit over the horizon so data reduction was done with pencil and paper and sometimes the new pocket calculators like the HP35.

Conclusion

We have come a long way since the early 1980's. While the IAPPP has faded, SAS has sprung up to fill the gap. We owe Doug Hall a huge amount of gratitude for his inspiration and dedication in helping amateur astronomers become serious contributors to the science of astronomy.

The Strange RS Canum Venaticorum Binary Stars

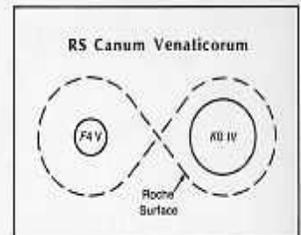
MICHAEL ZEILIK, *University of New Mexico*, DOUGLAS S. HALL, *Vanderbilt University*, PAUL A. FELDMAN, *National Research Council of Canada*, and FREDERICK WALTER, *University of California at Berkeley*

IMAGINE TWO STARS, each about 40 percent more massive than the sun. One of them, with a surface temperature of around 6,700° Kelvin, is about 1,000° hotter than the sun, while the other is cooler by about the same amount. Picture these stars, locked by the invisible ropes of gravity, in a binary system with an orbital period of 4.8 days. They circle each other only about 0.08 astronomical unit apart — a mere fifth of the distance of Mercury from our sun.

The stars are 145 parsecs (473 light-years) distant, and their orbital plane lies in our line of sight. Thus, every 4.8 days we see the hotter and more luminous star eclipsed by the cooler one. The system's total light dims by about one magnitude during such a primary eclipse.

The name of this binary system is RS Canum Venaticorum (abbreviated RS CVn). At first glance it seems a rather ordinary eclipsing variable, but there is much more to RS CVn. For example, a mysterious wave with an amplitude of about 0.1 magnitude migrates along its light curve. Bright lines of singly ionized calcium appear in its spectrum even outside the times of eclipse. The system gives off an intense glow of X-rays and sends out powerful radio emission, often in bursts. Finally, the orbital period varies continuously.

What's going on here? Why should two stars that would be so normal by themselves become so active in a binary system? That's the key question to answer for RS CVn and other binaries like it.



In this schematic cross-sectional view of the RS Canum Venaticorum binary system, shown perpendicular to its orbital plane, the center-to-center separation of the stars is 16.8 solar radii. At left is the dwarf component, of spectral type F4 and with a mass of 1.40 suns and a radius 1.88 times the sun's. The subgiant component is cooler, being of spectral type K0 and with a mass and radius of 1.34 and 4.10 suns, respectively. Within the Roche surface, matter can be exchanged between the two stars. This diagram has been adapted from J. P. Olivier.

THE RS CVn BINARIES

Until 1975 it wasn't fully clear that a peculiar group of binary stars had much in common. Then Douglas Hall proposed that the following features set these binaries apart from others: orbital periods from one day to two weeks; the strong calcium emission mentioned above; and the hotter star of spectral type F or G, the cooler of late G or early K. At that time about 24 systems came under this definition; 30 are now known, along with 15 long-period and six short-period cousins.

Recently, nine RS CVn and related systems have been discovered to emit soft X-rays as well as radio flares. Of special importance is HR 1099, a 6th-magnitude star in Taurus, at right ascension 3h 34.2m, declination +0° 26' (1950 coordinates). At the end of February, 1978, HR 1099 (recently given the variable star designation V711 Tauri) underwent a giant radio outburst. This dramatic event and the growing interest in the RS CVn stars prompted the first meeting, in April, 1978, of the newly formed RS CVn Working Group, at the New Mexico Institute of Mining and Technology in Socorro.

Sponsored by radio astronomer David Gibson, it was aimed at discussing old observations, coordinating new ones, and batting around ideas concerning the physi-



These participants at the RS Canum Venaticorum Working Group meeting visited the Very Large Array near Socorro, New Mexico. From left: Daniel Popper (University of California at Los Angeles), coauthor Douglas Hall (Vanderbilt University), Dorothy Fraquelli (University of Toronto), and David Gibson (New Mexico Institute of Mining and Technology). Photograph from the public information office, New Mexico Tech.