



News from The Society for Astronomical Sciences

Newsletter for the Society for Astronomical Sciences

Vol. 1, Number 1

Welcome to the first newsletter from the Society for Astronomical Sciences (SAS), the renamed IAPPP Western Wing. We are in the process of reorganization and have taken on a new name to better reflect the growing interests and the growing technology which allows us to do our science, both as amateurs and in collaborations with professionals. It was felt, not only by the committee but also by the feedback received at the past IAPPP-

WW meeting by the members that it was in the best interest of the group to strike out on its own and form a new organization. The committee worked hard coming up with a new name and logo which would better reflect the interests of the group. Thanks to Bob Stephens, we now have a new web site and domain name. (socastrosci.org) Keep posted on this web site, we have many plans to expand it and make it more useful for amateurs inter-

ested in doing science with their instruments.

We would like to see the newsletter issued quarterly, with the help of members and their submitted articles. This could consist of short updates on what a member is up to in his or her area of science. So... look on this as a call for articles from you, members of SAS. Your participation will help make this new group as successful or even more so as it has been over the past years.



Eighty five people participated in the IAPPP-WW meeting this year at Big Bear covering many areas of telescope sciences making this a highly successful meeting

Call For Papers and Newsletter Articles

We will be looking for articles by members for publishing in the newsletter. These should be on the less technical side, perhaps projects being pursued, evaluation of an instrument or software or an article with a historical slant. For the more technical articles, we will have an area at our new web site in the future will allow us to post papers by members. These would be technical in nature. In addition, I would like to have an area where members who have published papers in Professional journals as collaborations

with professionals can post their work. We have a number of members who have done this. So I would like those of you who have such papers to submit them to the editor as pdf files so at a future date they can be posted. Here is your chance to shine within SAS. If there are copywrite issues with this, and I will explore this, then we certainly can post

the citation. Lets show the world, not only what we are doing but what has been done recently in the way of publications!! More details to follow in the next Newsletter.

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If you wish to be a speaker at the 2004 Symposium on Astronomical Sciences, please see the schedule for the 2004 symposium below and visit our web site at

February 21, 2004	Last date to submit abstracts
February 24, 2004	Acceptance Information to speakers
April 4, 2004	Final papers submitted based on accepted abstracts
May 5, 2004	Anticipated printing run
May 26, 2004	Distribution at conference

An Early spectroscope used to fingerprint the elements



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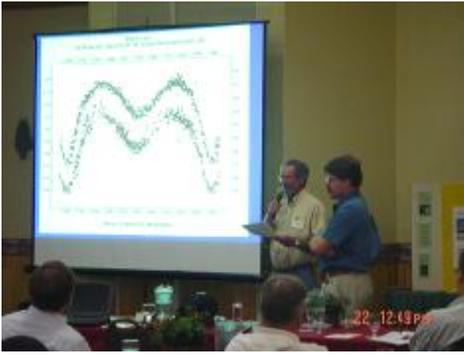
Committee:

- Leroy Snyder – Co-Chairman
- Robert Stephens – Co-Chairman
- Robert Gill – Audio Visual Webmaster
- Dave Kenyon – Program Co-Chairman
- Dale Mais – Program Co-Chairman, Newsletter editor

Advisors:

- Arne Hendon
- Dirk Terrell

The 2003 Symposium on Telescope Science



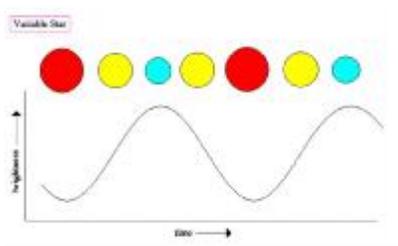
Robert Stephens / Robert Koff: Discovery of Variable Stars as a Byproduct of Asteroid Lightcurve Work



Rick Finberg: Can Amateur Astronomers Do Good Science?



Breaktime with the vendors. As always we greatly appreciate the support of our vendors who help make these meetings a success



Once again we returned to the Northwoods resort which is well suited for the symposium. This year was highlighted with workshops all day Wednesday. In the morning, Arne Hendon of the USNO conducted a workshop on photometry and improving your accuracy. In the afternoon, Dirk Terrell of the Southwest Research Institute gave a workshop on binary stars, different types and how to evaluate them. At the end of the day, the die hards got to try out software that Dirk brought with him.

Thursday was the general paper session. John Menke discussed his starting efforts at obtaining asteroid rotational periods while Bob Stephens and Robert Koff discussed what to do with those pesky variable stars that keep creeping into their asteroid images. We were privy to another outstanding talk by Dale Mais on the latest techniques in amateur spectroscopy. The keynote speaker was Rick Finberg, publisher of Sky & Telescope magazine, who asked the question, 'Can Amateur Astronomers Do Good Science?' His conclusion was, with proper training, yes they can. Finally, the funniest talk was delivered by Lee Snyder who discussed the trials and tribulations of

building a multiple telescope observatory at Western Nevada Community College. None of us will ever forget Lee 'Walking Naked' as he lost a bet on when the project would be completed.

The Hospitality Room was open both evenings where much of the education happens. The Bisque brothers once again demonstrated their Paramount setting it up, obtaining a T-Point Model, and taking images all over the sky. In addition, they demonstrated their new TheSky Version 6 which will be available in the Fall.

Eighty-five attendees came to the fabulous Big Bear skies to enjoy the mountains and learn from the talks. The Symposium was sponsored by Apogee, HighPoint Scientific, Santa Barbara Instruments, Sky and Telescope Magazine, and Software Bisque.

Workshops Presented:

Arne Hendon: Photometry Workshop

Dirk Terrell: Eclipsing Binary Workshop

Talks Given:

Lee Snyder: Building a New Observatory

Bob Denny: Automation Techniques for Scientific Astronomy

John Menke: Confessions of a Beginner Asteroid Light Curve Photometrist

Dale E. Mais: Mira Variable Stars: Spectroscopic and Photometric Monitoring of this broad class of Long Term Variable and Highly Evolved Stars.

Rick Finberg: Can Amateur Astronomers Do Good Science?

Robert Stephens / Robert Koff: Discovery of Variable Stars as a By product of Asteroid Lightcurve Work

Peter Cervolo: A New All Spherical Optical Design For Meter Class Telescopes

Roy Tucker: The MOTESS System



Dirk Terrell and his workshop on Eclipsing Binaries

Visit your Website at:

SocAstroSci.org

Membership Information

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

After debate among the committee members, it was decided 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, the same membership fee of the old IAPPP organization. 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. This past meeting, as you all know, we had Arne Hendon and Dirk Terrell participate by giving workshops. Since we pay for their travel and hotel expenses, this adds up, but enriches the content of the meetings, and it is something we will continue to do and hopefully even expand.

We have hopes or at least I have hopes, if we can achieve a critical mass of contributors, of starting an electronic journal as a means of publishing results from members.

In addition, in an effort to expand our ranks with those interested in the spectroscopy area, I have begun to advertise the group through the various spectroscopy user groups both nationally and internationally. Hopefully we will

be able to draw some others into The Society, and especially to participate in our yearly symposium, so you all will not have to always listen to just me beat upon the spectroscopy drums.

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.

The SAS is a 501(c)(3) charitable organization. As such, we can accept charitable contributions which are deductible to the giver, provided that they can itemize their deductions. Under IRS regulations, if membership dues to such an organization are less than \$75, then membership dues are entirely deductible as a charitable contribution.



Arne Hendon conducts a workshop on photometry on Wednesday morning

The upcoming symposium will be held May 26 and 27, 2004. Registration materials will be mailed in January 2004.



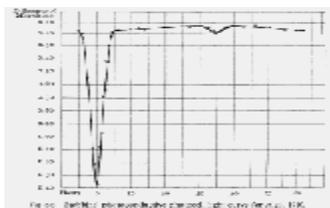
IAPPP-Western Wing meeting group photo. This is the last meeting under the IAPPP banner. Beginning in 2004, it will be The Symposium for Telescope Sciences.

Society for Astronomical Sciences (SAS)



A Brief History of Photoelectric Photometry: 1892-1942

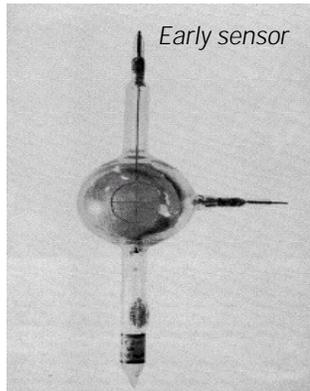
The history of astronomy is a history of attempts to measure starlight more precisely. After decades of attempts at using photographic plates to calibrate the magnitude system of the stars, the first experiments in photoelectric photometry (PP) were made in Ireland by amateur William Monck in 1892 with his 7.5 inch Clarke refractor. (Note here that as in spectroscopy, it was amateurs that lead the way in initial photometric experiments.) The primitive photoconductive cells consisted of an aluminum substrate with a selenium layer over it and mounted in a glass cell filled with acetone. He successfully measured current from the light of Jupiter and Venus. The cells improved significantly by 1894 by using a castor oil distillate in place of acetone. After many years of trial and error at the telescope, Joel Stebbins at the University of Illinois, using the selenium cell, published his seminal light curve of Algol in 1910. It is



difficult for us to appreciate these early efforts. Stebbins cell was cooled with ice, after a few seconds exposure for a measurement, several minutes of "dark time" were needed for the cell to recover. In addition, every selenium cell was very different in their spectral response and sensitivities con-

tributing to the early difficulties in standardizing measurements from different observatories. Needless to say, making these cells was an art unto itself. These photoconductive cells were the precursors of the photoelectric cells which first appeared in use in Europe a few years later.

These new photoelectric cells used potassium hydride as the sensor initially, and later other alkali metal hydrides such as



rubidium providing sensitivity gains of greater than 100 over the selenium cells. While very delicate and an irksome tendency for the zero point to drift, they could register 10^{-13} amp current. In addition, the early decades of measurements with these cells could only be done at wavelengths less than ~5000 Angstroms because of loss of sensitivity outside the blue region. Nonetheless, progress was made by experimentation such as changing the gas in the tubes, the type of glass used for the tubes, changing the temperature and of course using different substrates. Clearly, the early solid states physics research was of

direct benefit to astronomers as they sought new and better photosensitive materials.

Leading into the 1930's, electronic amplifier advances using direct current amplifiers allowed currents down to 10^{-16} amps to be measured. In other words, magnitude 16 stars could now be measured using the 100-inch Mt. Wilson telescope with a quantum efficiency of 1%. It should be noted here that the use and value of filters which allowed discreet wavelength bands to pass had not gone un-noticed. The use of filters for measuring colors and temperature was a direct ancestor to the Johnson-Cousins photometric system to come decades later.

Finally, as the 1930's advanced new materials were be tried that finally pushed the sensitivities of the photoelectric cell into the red region of the spectrum. The cesium-oxide-silver cell had a peak response around 8000 Angstroms. The cells needed to be cooled using dry-ice. No increase in quantum efficiency was obtained but now with red sensitivity, it finally made measurements of color more meaningful. John Hall first made use of these cells with a

now classic series of papers in The Astrophysical Journal between 1934-1942 measuring red and near infrared regions. He also was the first to use refrigeration to dry ice temperatures to cool the cells in order to lower the dark current. The success of Hall in the late 1930's with this tube prompted Joel Stebbins to initiate a program of multi-filter photometry with these tubes and filters designated as UBVRI. So the foundations of the Johnson-Cousins system were first established well before Johnson and his co-workers firmed it up as one of the established multi-wavelength photometric systems.

The first conference of photoelectric photometrists was a [Symposium on the photoelectric cell in astrophysical research](#) held in Seattle in 1940. There were 5 participants in this conference-workshop, the leaders of PP in North America in the pre-photomultiplier era. Soon to evolve was the use of photomultiplier tubes in photometry.

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