



# News from The Society- for Astronomical Sciences

Vol. 2, Number 3

## Changes in SAS Organization Structure 2005 Symposium Rapidly Approaching + Workshop

A few changes have resulted in the structure of SAS as a result of our October committee meeting. First we welcome the addition of Jerry Foote to the Committee. Jerry has been a long time member of IAPPP-WW and now SAS and has been an active participant during those years. We put him right to work as Program Co-Chair where he can help in organizing the Symposium. (Also we felt he could do the least amount of damage there) Secondly we determined that election of new Board members will occur on May 24, 2006. The current Board members include Bob Stephens, Bob Gill, Dave Kenyon, Dale Mais, Brian Warner and Lee Snyder. The function of the Board is to nominate Committee members which oversees such things as our annual Symposium, the Newsletter etc. The terms of the office are 3 years. A nominating Committee will be appointed to direct and run the 2006 elections. Here is an opportunity for you to participate to a greater extent if you are so inclined. The new Board will then appoint new Committee members. Previous members may be re-appointed.

There have also been some slight changes in how Sponsors will be able to participate in the Annual Symposium. We are

greatly indebted to our Sponsors support each year. Without it we would have a difficult time putting on the quality program we aim to achieve each year. This year we are opening up the opportunity for each of our sponsors to speak for approximately 15 minutes during the Program on a new or upcoming product they feel would be of interest to the SAS participants. The exact amount of time will be somewhat determined by the final number of Sponsors and whether they wish to participate.

### Other Changes of interest

Bob Gill has taken over the maintaining the SAS website. As a result Bob has re-built the website into a new and improved version. The new site maintains the same web address at <http://socastrosci.org/Default.htm>

The committee approved awarding Dr. Douglas Hall a Life-Time Honorary Membership in the SAS in recognition of all he has done over the course of 2 decades to promote amateur involvement in photometry.

*We thank our 2004 Sponsors whose support makes our meeting possible:*

- APOGEE INSTRUMENTS, INC
- SANTA BARBARA INSTRUMENT GROUP
- SKY & TELESCOPE
- SOFTWARE BISQUE

The 2005 Symposium is important dates to keep in beginning to take shape. mind as deadlines approach. The Speakers committee Remember, posters are just as continues to solicit participa- viable as a means to present tion from various Profession- some of your work, indeed in als. At this point there is many ways I prefer it because nothing definite we can com- of the interesting interactions ment on with regard to in- with those who come by and vited speakers. As always when dealing with Profes- sionals, their busy schedules make it difficult at times to commit to far in advance.

As always we actively invite you to submit an abstract to present a paper. Below are

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#### Committee:

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

#### Advisors:

- Arne Henden
- Dirk Terrell
- Alan Harris



## Your Participation Wanted!

### 2005 Symposium Rapidly Approaching + Workshop cont from page 1

question you. We on the Speakers/Program Committee are ALWAYS looking for new participants to present, its the life blood of any organization. Nobody wants to hear the same speakers year in and year out, only with new speakers presenting their efforts in a fresh light are new ideas and thoughts spawned.

On the Tuesday before the Symposium, Brian Warner will conduct a workshop that will focus on photometry and in particular the use of his MPO software for analysis of photometric data. His registration fee will include a copy of the MPO and PhotoRed

software packages. Participants should plan to bring their laptops as the software will be installed on your machines and active participation in learning/analysis will take place. Beginners/intermediate groups are being targeted for this workshop. Arne Henden has expressed interest in attending this workshop but details need to be worked out. Please note that this is NOT an SAS event, but is a workshop being put on by Brian Warner. Watch his web site at <http://www.minorplanetobserver.com/> for more details.

### Important Future dates for 2005 Symposium

February 21, 2005	Last date to submit abstracts
February 28, 2005	Acceptance Information to speakers
April 8, 2005	Final papers submitted based on accepted abstracts for proceedings
May 6, 2005	Anticipated printing run
May 25, 2005	Distribution at conference

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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. Constructive 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.

In this issue we have an article by Bob Buchheim and a letter to the editor on page 3. Please participate and don't forget to get your abstracts in for the 2005 Symposium.

## News from the Working Group for Professional-Amateur Collaborations (WGPAC)

In the last Newsletter (Vol 2 #2) I reported on some of the activities of the American Astronomical Societies (AAS) Working Group for Professional-Amateur Collaborations (WGPAC). At the time, Dr James C. White was the Chairman of the group and several new members were brought on board to serve terms. Teleconference calls were a regular thing and a special session at the Denver AAS meeting was organized. The web page of the group (<http://www.aas.org/wgpac/>) was expanding and a registry was created to allow both amateurs and professionals to input their needs/requests in the hope of forming partnerships (<http://www.aas.org/wgpac/registry/>). It seemed that the organization was truly ripe to bring a whole new

level of amateur participation in astronomy forward. Unfortunately, I am afraid that the steam seems to be coming out of the balloon. James White's term has expired and Richard Fienberg has taken over as Chairman of the committee. I fear that Rick is simply too busy to carry this additional load as nothing since the spring has happened within the group. I will certainly keep you all posted with regards to the groups activities and hopefully this will not be another good idea that simply withers away for lack of leadership.



## 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, 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.

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.

## Astrofest 2004 Toronto Canada

In August of 2004, I had the opportunity to attend a large Star Party called Astrofest outside Toronto Canada. This is one of the big star parties held on the eastern coast each year and is equivalent in size to Stellafane and RTMC Astronomy Expo. The group met in the rural areas of Toronto about 70 miles NW of Toronto. It was a very pleasant drive from the airport to the meeting during early evening after arriving at the airport. The theme the organizers put together for 2004 was doing science with your equipment. Bob Gendler was also there to speak. In fact I was scheduled to speak after Gendler and as the large meeting tent filled to hear his talk I got a little nervous as there were over 2000 listen-

ers. Needless to say I worried for nothing. Once his talk was over the tent emptied and the next group of science oriented speakers prepared. So there were only around 100-150 at the science talks.

This leads me to a new version of Fermi's paradox. Where are the amateurs interested in doing science? Several companies have conducted polls over the years in which they ask buyers of their products if they are or would be interested in doing science with their equipment. Well over 50% respond with a yes. Now simply adding up the numbers of people who purchase software/CCD cameras/telescopes/telescope

## Letters to the Editor

Brian,

I recently had the privilege of going to Blue Canyon Airport on a cloudy evening. Saturday, September 11th to be exact. I was one of four people up there that night. Two women who are not members and one other member. The other member gave up because of the cloudy sky and went home.

The SkyClock had predicted that there would be a window from 11 PM to 3 AM and it was partly cloudy until the 11 PM clearing. As a member of the Messier Group, I was the only representative attending, I think.

My targets for the night were M54, M69, M70, M25, M55, M11, M26, M107, M92, M56, M29, and M27. I added the Veil Nebula, M31, Pleiades, Pluto, the North American Nebula, and

the Pelican Nebula. I managed to find 11 and not find 7 for a 61% success rate. I was using my Meade SN10 10 inch Schmidt-Newtonian.

The evening started with partial cloud cover and gradually cleared by 11 PM. By then the seeing was good and the darkness was very good. Of the ones I found, the most spectacular was the Pleiades and the most intriguing was the Vail Nebula. The clouds only hid one object from me and that was M107, a ninth mag. globular cluster. It managed to be behind the clouds every time I turned my attention to it. All in all, it was a very productive evening. The lesson to be learned is to not trust the sky over Sacramento, and check the SkyClock to see what is predicted.

Astronomically yours,  
Robin Alexander.



Astrofest meeting 2004

mounts etc, multiplying by 50% one is left with a reasonably hefty number. Yet when you add up members of various groups such as SAS, AAVSO and ALPO one gets only 500-600 active members. So Fermi's paradox rears its head: Where are they? How can they be reached? Or perhaps, do they really want to be reached?

by Bob Buchheim (Altimira Observatory)

Those of you who were at the 2004 SAS Symposium will remember that Dr. Tim Castellano challenged us to observe the approximately 1.8% brightness drop of HD209458 when its planet (“b”) transits the stellar disk. I am pleased to report that it can be done from your backyard, just as Tim said, if you do a little advanced planning, and are very careful with your photometry.

This measurement presents three interesting challenges. First, it is a very subtle effect – less than two hundredths of a magnitude – so it demands high signal-to-noise ratio. Second, the star is very bright – visual 8<sup>th</sup> magnitude – so that you’ll use short exposures to avoid non-linearity in your CCD images of the target star. Third, the transit event is visible only approximately once a week, and you’ll need to gather a continuous sequence of images for at least 2 (and preferably 4 or more) hours in order to have a good record of the pre- and post-entry brightness.

In order to get properly prepared, I took a series of images of the target star on “non-transit” nights, using various filters and exposures. My objective was to verify the linear range of my imager (SBIG ST-8XE, NABG), and find a combination of filter and exposure that would provide good Signal to Noise Ratio (SNR), reasonably long (!) exposure time, and good “efficiency” of collecting photons. This advance planning is particularly important because of the brightness of the target star: saturation of the image could easily swamp the tiny photometric signal of the transit. I used a Johnson-Cousins “B” filter, and 30 second exposures with my NexStar-11 operating at F/6.3. The “B” filter presents relatively low sensitivity (compared to “V” or “R”), permitting longer exposures. The 30-second exposure is beneficial for two reasons. First, it tends to average out seeing-induced scintillation. (Theoretical models show that at exposures shorter than 30 seconds, the effective SNR is dominated by scintillation, and that the effect

can be really serious for ~5-second exposures that would be required with my set-up using “V” band). Second, the 30-second exposure seemed like a better use of photons than the shorter “5-second V band” alternative. This “efficiency” effect is based on the following:

action	“B” band	“V” band
science data exposure	30 sec	5 sec
image download	15 sec	15 sec
pause to allow auto-guider to stabilize after image download	15 sec	15 sec
total cycle time	60 sec	35 sec
imaging efficiency = (science exposure/cycle time)	50%	14%

That is, with the 30-sec B band sequence, about half of the time is spent collecting science data frames; the “5 sec V band” alternative, only 14% of the time is spent collecting science data. My formal SNR was about 800 on each image.

Auto-guiding is important – Tim’s recommendation (validated by my experiments) is that even after good flat-fielding, a stellar image wandering around on the pixels can generate a fraction of a percent of counterfeit fading or brightening.

My data reduction was pretty standard: dark frame and flat fields, then photometry using MPO Canopus with 17 pixel diameter measuring aperture. The resulting raw data was pretty good, showing random scatter of less than 1% RMS. In order to smooth the results further, I ran a “top-hat” running average over it, using the equation:

$$avg_i = (raw_{i-2} + raw_{i-1} + raw_i + raw_{i+1} + raw_{i+2})/5$$

The net result of running that 5-point average is shown in Figure 1: See page 5

The 1.8% fading caused by the transit is plainly visible, and occurs at exactly the correct (predicted) time. That’s the successful observa-

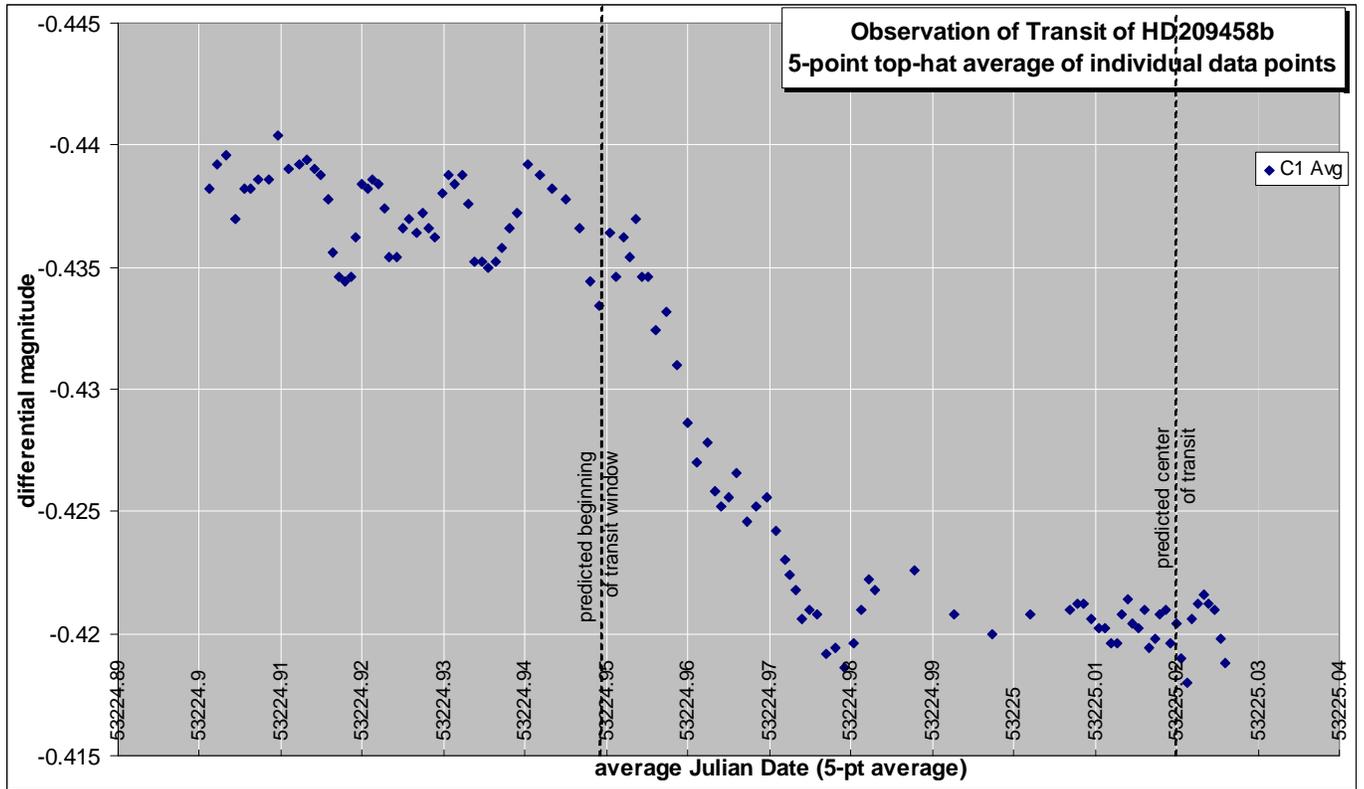


Figure 1

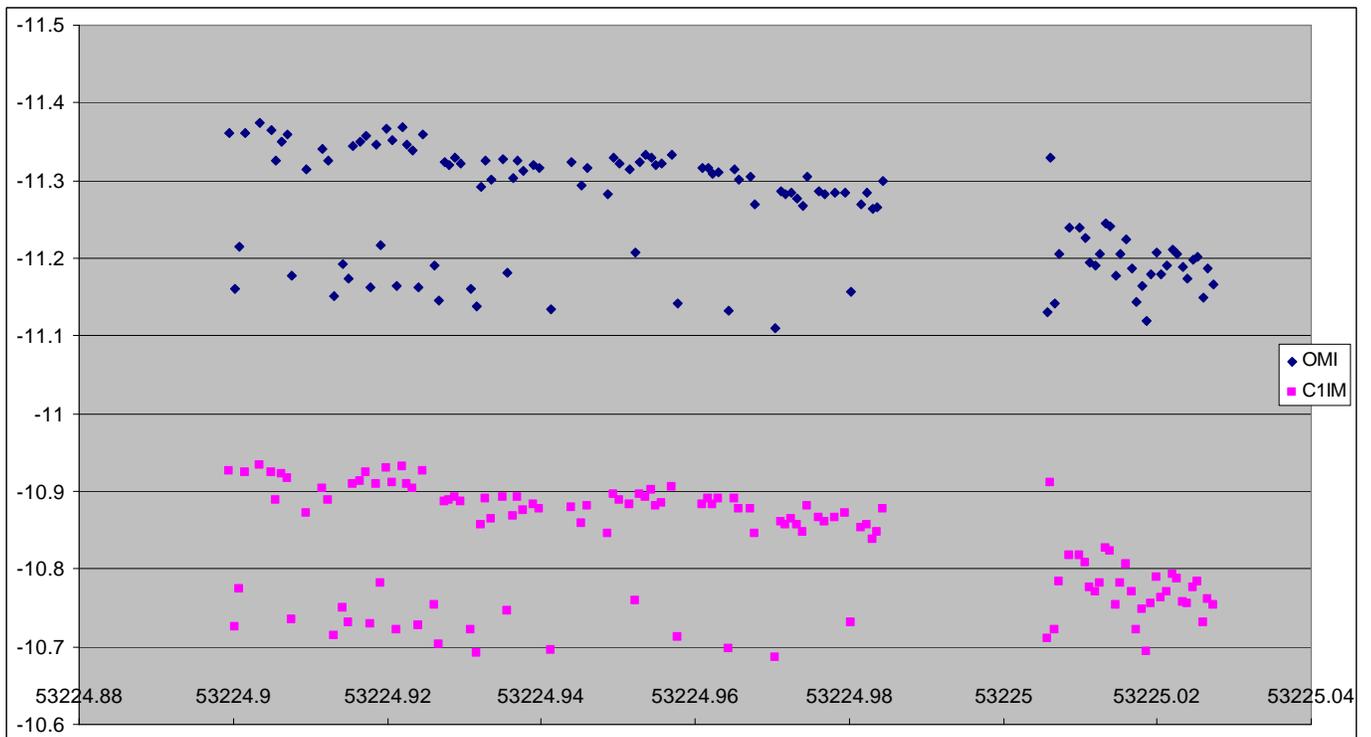


Figure 2

tion. The curiosity follows –

I noticed a curious effect in the raw photometry of the target and comp stars. If I plot instrumental magnitude vs. time, I get the following: See Figure 2 page 5. Both the target star and the comp star show the expected slight brightness reduction as they move away from the zenith, due to atmospheric extinction (the night seemed clear, and seeing was good, but I did not specifically measure the extinction coefficient). And the two stars move up and down in brightness in perfect synchronicity, as expected. Nevertheless, the curves are curious – each is almost a bi-modal distribution, in which the star spends most of the time at its “normal” brightness, but about 20% of the data points lie 0.1 magnitude below the main “normal” trend line. This doesn’t seem like noise or scintillation, because it’s so clearly bi-modal (noise or scintillation would randomly

“fill in” a continuous random distribution). Ordinarily I would blame this sort of thing on wispy clouds contrails passing through the FOV, but it is hard to accept that theory when the brightness bounces up and down by 0.1 magnitude in one minute.

I suspect that the effect is caused by a slight variability in the exposure time (i.e. inconsistency in shutter timing in the camera). According to SBIG, their shutter should be accurate to about 5 milliseconds (i.e. negligible effect). The best guess is that my PC (an old Pentium I) is so heavily worked running CCDSoft, auto-guiding, and exposing images, that it occasionally skips a beat, resulting in slight variation in the exposure time.

This is another lesson that when you’re attempting photometry at the one-percent level, “everything matters”.