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Observations from the SW Astrophysics Spectroscopy-Photometry Meeting

By Jennifer Polakis

Saturday September 6, 2008, At the Blue Hills Observatory, Dewey Arizona

Since childhood Christmas mornings and cartoon weekends, there have only been a handful of events capable of waking my dreams in the early morning of a non-school day. But here I was, meeting up with fellow Saguaro Astronomy Club member, Gene Lucas, in the too-wee hours of Saturday for a ride share to Stan Gorodenski's Blue Hills Observatory in Dewey Arizona for the Southwest Astrophysics Spectroscopy-Photometry Meeting AND I was excited for it!

Ten folks participated in this first of hopefully more events, including the five who made the presentations, Scott Louts of Desert Foothills Astronomy Club, Mark Trueblood of Tucson Amateur Astronomy Association/NOAO, Bill McDonald from Prescott Astronomy Club, and Steve Gifford from East Valley Astronomy Club.

Akin to the difference between my "Kumbaya" observing on a scope named

Magpie and Mr. Joe "a million objects beyond the Herschel 400s" Goss's observing time and technique, photometry/spectroscopy covers the entire seriousness spectrum from FUN to real published contributions to our favorite field of science. With varying amounts of \$astrodollars, learning curve elevations, and honeydew time reallocation, amateur astronomers can use photometry/spectroscopy to enhance visual observing or even make a switch to this aspect of observing (but please don't do that!)

The lower elevation of my learning curve enabled me to glean enough information from this conference to fill a nutshell, hopefully enough to

spill onto this edition of SACnews to spark some interest. Photometry is used to measure intensity of an object/star's electromagnetic radiation to determine magnitude. Sky Quality Meters are photometers that measure in sky brightness values. A camera light meter can be used as a weapon on light pollution by making exposures of artificial light sources to determine

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Some of the attendees at the Blue Hills Observatory: Clockwise from Lower left: Gene Lucas, SAC, Behind Gene (face not visible) Roger Serrato Desert Foothills Astronomy Club, Standing in back Left to Right: Bill McDonald, Prescott Astronomy Club, Steve Gifford, VAC/Mark Trueblood NOAO & TAAA, Jennifer Polakis, seated foreground right Jeff Hopkins.



The Chemical Weather Report

Sunny tomorrow with highs in the mid-70s. There's going to be some carbon monoxide blowing in from forest fires, and all that sunshine is predicted to bring a surge in ground-level ozone by afternoon. Old and young people and anyone with lung conditions are advised to stay indoors between 3 and 5 p.m."

Whoever heard of a weather report like that?

Get used to it. Weather reports of the future are going to tell you a lot more about the atmosphere than just how warm and rainy it is. In the same way that satellite observations of Earth revolutionized basic weather forecasting in the 1970s and 80s, satellite tracking of air pollution is about to revolutionize the forecasting of air quality. Such forecasts could help people plan around high levels of ground-level ozone—a dangerous lung irritant—just as they now plan around bad storms.

"The phrase that people have used is chemical weather forecasting," says Kevin Bowman of NASA's Jet Propulsion Laboratory. Bowman is a senior member of the technical staff for the Tropospheric Emission Spectrometer, one of four scientific sensors on NASA's Aura satellite.

Aura and other NASA satellites track pollution in the same way that astronomers know the chemical composition of stars and distant planetary atmospheres: using spectrometry. By breaking the light from a planet or star into its spectrum of colors, scientists can read off the atmosphere's gases by looking at the "fingerprint" of wavelengths absorbed or emitted by those chemicals. From Earth orbit, pollution-watching satellites use this trick to measure trace gases such as carbon monoxide, nitrogen

oxide, and ozone.

However, as Bowman explains, "Polar sun-synchronous satellites such as Aura are limited at best to two overpasses per day." A recent report by the National Research Council recommends putting a pollution-watching satellite into geosynchronous orbit—a special very high-altitude orbit above the equator in which satellites make only one orbit per day, thus seeming to hover over the same spot on the equator below. There, this new satellite, called

GEOCAPE (Geostationary Coastal and Air Pollution Events), would give scientists a continuous eye in the sky, allowing them to predict daily pollution levels just as meteorologists predict storms.

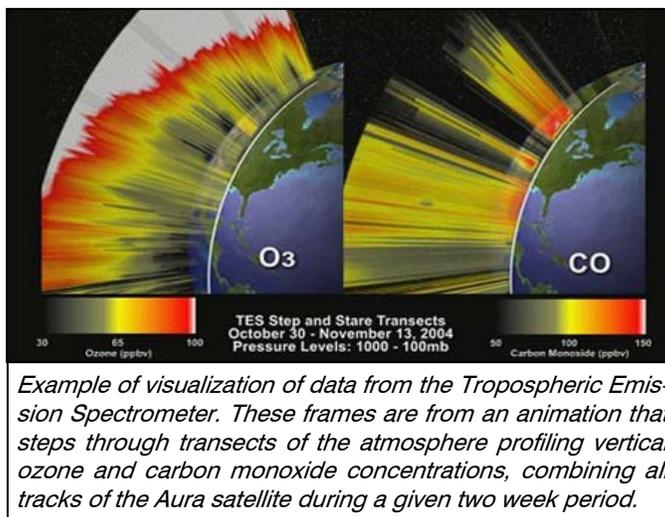
"NASA is beginning to investigate what it would take to build an instrument like this," Bowman says. Such a chemical weather satellite could be in orbit as soon as 2013, according to

the NRC report. Weather forecasts might never be the same.

Learn more about the Tropospheric Emission Spectrometer at tes.jpl.nasa.gov.

Kids can learn some elementary smog chemistry while making "Gummy Greenhouse Gases" out of gumdrops at spaceplace.nasa.gov/en/kids/tes/gumdrops.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Example of visualization of data from the Tropospheric Emission Spectrometer. These frames are from an animation that steps through transects of the atmosphere profiling vertical ozone and carbon monoxide concentrations, combining all tracks of the Aura satellite during a given two week period.

Citizen Scientists

By Mike Simonsen, [Simostronomy](#)

One of the many interesting and exciting programs being developed for the [International Year of Astronomy 2009](#) (IYA) is what is called Research Experiences for Teachers, Students and Citizen Science. I spent the majority of my time at the AAS meeting, before, during and after the sessions, with the people in the working group who are making plans for involving the public in real astronomy research projects.

I admit to being biased when it comes to variable star research, but the project they are working on that involves monitoring the eclipse of epsilon Aurigae is absolutely fascinating.

Now let's get this pronunciation thing out in the open. Auriga the constellation is pronounced aw-RYE-guh. The genitive of the name, Aurigae, is pronounced aw-RYE-gee. If you are a citizen and want to research this, here are some lists that agree, more or less.

[Sky and Telescope's page on pronunciations](#)
[AOL Hometown page](#) - don't laugh, they got it right.

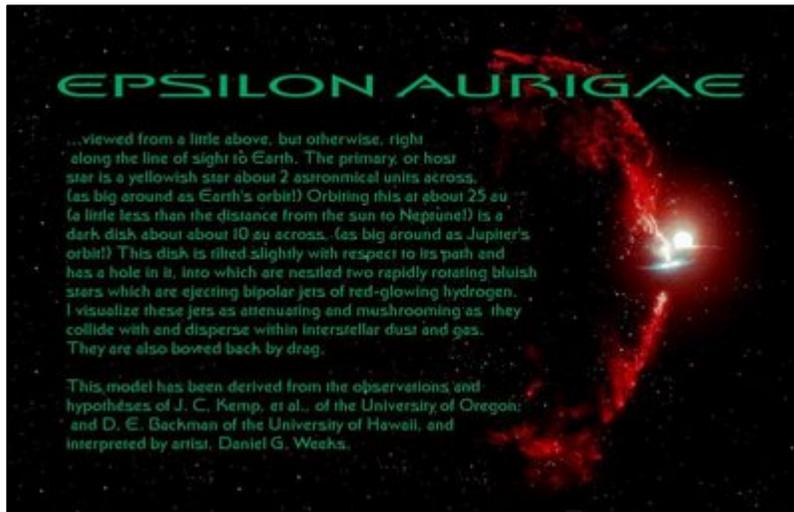
[Aaron B. Clevenson](#) - I never heard of him either, but he speaks the truth, and can pronounce it!

Okay, back to the point. Epsilon Aurigae (eps Aur) is an enigma. Even though it has been known to be an eclipsing variable star for over 150 years, and even though it is bright, easily visible with the unaided eye, we don't know much about its true nature at all.

Part of the problem is the eclipses only happen once every 27 years. You're living right if you get to witness two or three eclipses in a lifetime. Another challenge is the fact that due to its brightness it is not well suited for study by large ground based telescopes or space telescopes. We would blow up the instrument package on Hubble if we pointed it at a 3rd magnitude star! Another mystery arose when we began to study the system spectroscopically. Even though we could categorize the primary, there was no sign of the secondary object in

the spectrum. The companion is invisible, yet it eclipses the primary!

What we think we know is that the primary star of the pair is an FO1a supergiant. That is a spectral classification that reveals some characteristics of the star. These stars are typically 8-15 times the mass of the sun. They also sit precariously at the edge of the Cepheid instability strip on the H-R diagram. (Translation: this type of star typically evolves into another type of variable star that pulsates with a period that is proportional to its actual brightness, otherwise known as absolute magnitude). There is some evidence that the primary or something else may actually be varying with some periodicity, but not much is known for certain.



What we don't know could fill pages. Essentially, we do not know what the companion object is that orbits around the primary, periodically eclipsing it and dimming its light as seen from Earth. One popular model suggests it is a flattened disk-like object, perhaps with a hole in the center containing one or more stars, slightly tilted or warped in relation to its orbit.

The list of unknowns is impressive:

- How far away is it?
- What is the mass of the system?
- What is the mass of the primary?
- What is the mass of the secondary, whatever it is?
- Is the center of the disk empty?
- If not empty, what is at the center of the disk; one star, two stars, a black hole, something else?

Will the light curve this time resemble the last eclipse, or will it be different, indicating the system is evolving or changing in some manner?

There will be a coordinated observing campaign involving the public, using unaided eye, binoculars, telescopes, digital cameras and CCDs, to measure and ar-

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Call For Observations—Cygnus

By A.J. Crayon

The following are observations from Cygnus, the Swan and are from SAC members. It is always a treat to observing celestial goodies in this constellation anytime we have a clear night. Seems enough SAC members had some clear nights for the following observations.

NGC6819

8" f6, Newtonian, 38X; Charlie Whiting: from my urban site, I could only see 1 tiny spec of light in the vicinity where the cluster is supposed to be. At **60X** I saw that the tiny spec is a dim star beyond the cluster to the east. Now 5 or 6 faint stars show me where the cluster actually lives. At **150X** the number of faint stars visible is about a dozen. With AV the count increases by another half dozen. Using AV also increases the perceived brightness of the stars. I can also see the dusty background that tells me that lots more stars reside here.

8" SCT at 37x; Dick Harshaw: A nebulous cluster with a cigar shape, it is dominated by two "V"s that point NW with sharp voids between the legs. This cluster is 3.5 billion years old! It has survived so long because it lies 26,600 light years from the galactic center and 1,000 light years above the galactic plane.

11" SCT at 115x; Dick Harshaw: Beautiful, tight little knot of sparkly stars. At **193x**, it was very grainy. It boasts two columns of stars, the east one being a little richer and brighter. At **339x**, there is a trace of nebulosity in the eastern column. I counted 27 stars. It lies 8 min SW of a 7th mag star.

14.5" f5.2, Dobsonian, 220X; AJ Crayon: three nice groupings of stars separated by dark regions. There are 30 stars of 11th mag, 50 stars of 12th mag and a host of others from 13th mag with two very bright stars near-by. It is pretty small or about 5' in diameter.

16" f4.4 Newtonian, 200x; Rick Rotramel: OC - pL, fB, fRich, irregular shaped group of stars.

Fairy Ring

8" f6, Newtonian, 38X; Charlie Whiting: this asterism is visible as a circular group of faint stars a little SW of 6th mag BU 1481 (a double star - the 13th mag secondary is invisible at my urban site). At **60X** I counted about 18 stars participating in creating a roughly round wreath, including 8 sets of double stars. The western half of the ring harbors the brightest 4 pairs. Starting from the northernmost pair and working clockwise (towards the west in my telescope), the colors are: blue/blue, yellow/blue, blue/blue, blue/blue, yellow/blue, blue/gray, gray/gray, and gray/gray. Ten additional stars bridge the gap in a double line through the ring from NW to SE.

14.5" f5.2, Dobsonian at 90X; AJ Crayon: This asterism

is 20', contains 30 stars from 10th to 14th mag in an oblong shape and are unevenly spaced.

NGC6888

8" SCT at 47x; Dick Harshaw: It embeds a string of six stars, including STT 401. It is crescent shaped. Note the deep red star 25 min NE (this is the carbon star RS Cygni, which varies from 6.5m to 9.4m). A Wolf-Rayet star is involved in this nebula.

The next nearby entry is an open cluster **NGC7044**. This Herschel 400 entry is large, rich and faint with stars from 15th to 18th mag.

8" SCT at 206x; Dick Harshaw: Faint and not well-detached from the background. It is a nebulous knot at low powers; at **200x**, 7 stars were resolved, and formed a vague "?" pattern.

11" SCT at 115x; Dick Harshaw: Very poor, faint; not much range in magnitude. A 10th mag star dominates. I counted 16 stars down to 14th mag.

14.5" f5.2 Dobsonian at 90X; AJ Crayon: The Crescent Nebula is well known and well documented. It covers a 20'X10' region, forming an arc, in a northeast position and is very faint until a UHC or OIII filter is used. The actual arcs of nebulosity are about 5' wide. The center of the nebulosity has a protrusion to the inside that involves a 7th mag Wolf-Rayet star. There is another 7th mag and 8th mag star involved. With the filters the brightest part is to the north.

16" f4.4 Newtonian, Rick Rotramel: OC - pS, pF, vRich, irregular shaped, resolved at 100x.

Berkeley 86

8" f6, Newtonian, 60X; Charlie Whiting: I see a pattern of 8 stars similar to a sauce pan except the bottom is not flat. At **150X** I counted up to 17 stars that I think belong to this cluster. A few of them could only be seen with AV. The sauce pan morphed into a question mark figure with the straight part pointing east. 8 or 9 of the stars are bright enough to be seen easily. The other 8 or 9 stars are a challenge for my urban location.

8" SCT at 83x; Dick Harshaw: A triangular, grainy group 25 min S of a winding line of 8th and 9th mag stars. Not much denser than the surrounding field. The brightest stars (and they are really dim) resemble a mini-Lepus.

11" SCT at 115x; Dick Harshaw: It fills the field, but is very loose and spread out. The stars are bright, though, with the brightest being a rich, warm golden yellow in color. I counted 36 stars.

14.5" f5.2 Dobsonian, at 140X; AJ Crayon: There are 27 stars in 10' from 9th to 14th mag.

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NGC6910

9X50 finder; Charlie Whiting: Visible as a dim group of 3-4 stars forming a triangle.

8" f6, Newtonian, 38X; Charlie Whiting: the cluster and γ Cyg are in the same FOV. 4 fairly bright field stars form a broad-topped 'T' figure the center of which lies over the cluster. About 6 faint stars are resolved. At **67X** now 8 stars are resolved forming a semi-circle cup and a straight line. The cup faces northwest and the line runs southeast from the bottom center of the cup. At **120X** now 10 stars make up the cluster. Nebulosity is suspected but not confirmed. Tried 3 filters. All negative. At **240X** now I can count 12 stars not including 2 bright field stars. *Nice object!*

8" SCT at 65x; Dick Harshaw: The cluster is curved, and a 9th mag right triangle dominates. Note the two 7th mag yellowish-orange stars. It stands out well from the background.

11" SCT at 115x; Dick Harshaw: Nice bright group, shaped like a miniature Monoceros! It is dominated by two 7th mag yellow stars. I counted 14 stars.

11" SCT at 140x; Steve Coe: About 20 stars noted, in a 10m x 5m lozenge. Two 9th mag stars (one yellow) dominate. At **220x**, no changes.

14.5" f5.2 Dobsonian at 140/220X; AJ Crayon: 24 stars in southeast position, 10'X5', in a somewhat Y pattern, two 7th mag stars involved, others from 10th mag. One star is pale yellow, to the north of northwest and adds a colorful touch to the cluster. No attempt was made to view the near-by γ Cygni nebulosity!

16" f4.4 Newtonian, Rick Rotramel: OC - L, fB, Rich, about 80 stars, just north of γ CYG.

M 39

Spotter 10x; Dick Harshaw: This group looks best in the spotter. Three 8m stars lie on the N edge.

9X50 finder; Charlie Whiting: this cluster is visible.

14x70 Binocs; Dick Harshaw: I counted 11 stars in hazy skies. Brightest is 8.5m. Brighter on the NE end, but richer at the SW end. It was known to Aristotle (325 BC). Le Gentil noted it in 1750; Messier added it to his catalog on October 24, 1764.

8" f6, Newtonian, 38X; Charlie Whiting: this is one of those objects that can be enjoyed in spite of light pollution. This cluster is big, bright and fairly sparse. At this low power I count 22 stars. At **60X** the cluster just about fills the eyepiece FOV. I count 36 stars randomly dispersed. Very splashy object. But, I don't see how Messier could have mistaken this cluster for a comet.

11" SCT at 115x; Dick Harshaw: Very large and bright, very open. Mostly white stars.

Call for Observations

So far we haven't done anything in the constellation of Lacerta. Surprisingly it contains open clusters and

galaxies, which is what waits us for this session. Starting from the western part, near Cygnus, is **NGC7209**, a bright open cluster that is in both the *110 Best NGC* and *Herschel 400* lists. It has about 25 stars from 9th mag. Do you see it as scattered or compressed? About 5° south is the barred spiral **NGC7223**. What about the bar and spiral arms? Can you see them? Moving towards the northern part of the constellation is the open cluster **IC1422** and its 25 or so stars. The second galaxy, **NGC7265**, is same magnitude as NGC7223 but is larger and has a lower surface brightness. **NGC7296** is on the *Herschel 400* list is small and has 20 stars, so it may not be that easy to find. The last selection is the elliptical galaxy **NGC7426**. Beware it is just to the east of SAO72851, a double star, whose primary is mag 5.7.

Our constellation, for December, is Piscis Austrinus meaning *Southern Fish*. There are numerous galaxies in this constellation that should be within reach of 8" telescopes. So, let us hope the weather favors us for this unexpected trip below the celestial equator. Starting from the western end is the asterism titled **Air Balloon** and found at R.A. 21h 30.0m Dec -25° 30'. It is about 45' in diameter, contains a nice collection of 7th and 8th mag stars and is described as a closed loop of stars. What does it look like to you? Now on to the galaxies and we start with **NGC7135** that is mag 11.7, less than 3' and just southeast of 3 stars with mag 9.5, 10.3 and 11 that form a nice right triangle. Now we move on to a galaxy group containing 4 or 5 galaxies. The first is the spiral **NGC7172**, almost 12th mag, elongated and sporting an equatorial dust band. Can you spot it? The other galaxies are located just 7' due south and consist of NGC7173/74/76. They are located between 2 stars of 9th and 10th mag in a north of northeast position. **NGC7173** is the northern most, is 12th mag and somewhat elongated in a southeast position. **NGC7174** is a little larger, somewhat elongated in an easterly position and at mag 13.3 is the faintest of the group. The last is **NGC7176** only very slightly elongated with an uncertain position angle. Also involved in this triple grouping is the mag 11.9 galaxy **LEDA198475** located between NGC7173 and NGC7174. This grouping of galaxies is also known as Hickson 90. Moving on to the others, we continue with 11th mag **NGC7314**. This galaxy is quite elongated, not doubt because we are seeing the bar of this barred galaxy. Now mosey on to the spindle shaped **IC5269**, a rather small, elongated galaxy of mag 12.2. Next is the nearly edge-on **NGC7361** at mag 12.3. Can you detect a little brighter middle? Last we have the very elongated **IC5271** at mag 11.6. What do you see in the middle?

President's Corner

By Steve Dodder



Dear SAC members,

I've decided not to run for reelection for 2009.

While this position has been quite a lot of fun to execute, this year has been full of upheaval in my personal life, losing a job I thought was secure, then finding another, and losing it, too. Just the job searching alone is quite stressful. I thought long and hard to come up with a reason to continue, given my current employment and personal status. These things taken into account, I feel I am not in a position to continue this ranking within SAC. I've grown more and more distracted and also feel my focus is lacking to efficiently run SAC as it deserves.

In my time in office, I've achieved what I set out to do—set up and enhance our public outreach program and footprint for public awareness. I have confidence in Jack, Rick and Chris to carry on that policy. My agreement to carry on the legacy of Steve Coe with the Novice Group chairmanship, coupled with the coordination of the

Grand Canyon Star Party North Rim legacy should easily convey my commitment to the importance of this public outreach philosophy, as well as my commitment to the club's interests.

Surely, I have enough on my plate, coordinating the GCSPNR, along with the Kaibab Lodge contingent, not to mention the Novice Group.

It'd be useless to try to talk me out of it, so save your strength. Fortunately, I found and started another job at U-Haul last Monday, and this position seems much more stable than the others, so I'm hopeful. Perhaps later, when things settle down for Rosie and I, I'll consider another term as has been suggested by one of the board members. Until that time, I thank you for your support and encouragement and hope you'll consider nominating someone with a similar commitment to public outreach as I have.

Steve Dodder
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<http://www.stargazing.net/Astroman>

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chive the data. There will be discussion forums, scientific advisers, training, workshops, real-time feedback in the form of being able to see your observations displayed as distinct points in the up-to-the-minute light curve, and in the end all this will be turned into projects encouraging and assisting people in writing and submitting scientific papers to a refereed journal. The participants have the real opportunity to become "citizen scientists" indeed.

Think about that for a moment. You could be involved in writing a paper finally unlocking the secrets of a star that has baffled the likes of Gerard Kuiper, Otto Struve and Bengt Stromgren.

If you'd like to learn more, without having to spend a day and a half of your life Googling everything you've just read here, read the excellent [Variable Star of the Season](#) article by Matt Templeton on the AAVSO website.

As if that weren't enough, there are the beginnings of

plans to involve 'citizen scientists' in the [LCROSS mission](#). This is a mission something like the Deep Impact mission, where we slammed a spacecraft into comet 9P/Tempel to see what would come out of the blast; or more precisely like the [Lunar Prospector](#) mission, where the satellite was deliberately crashed on the moon to look for water ice in permanently shadowed craters. Both experiments caught the public imagination. LCROSS will bomb a permanently shadowed crater at the the moons' south pole to look for ancient ice buried there. Mission scientists estimate the LCROSS impact plume may be visible through amateur telescopes with apertures of 10 to 12 inches.

Although I doubt they will be looking for amateur collaboration writing the science results up for publication, they will be encouraging as many observers as possible to cover the impact. You never know, it might be cloudy in Hawaii that night, and your images with your home-built 20 inch scope and CCD could be the best ground based visual record of the event.

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November 2008

| SUN | MON | TUE | WED | THU | FRI | SAT |
|-----|-----|---|------|------|-----------------------------|-----------------------------------|
| | | | | | | 1 DOTM Star Party at Antennas |
| 2 | 3 | 4 | 5 ☽ | 6 | 7 | 8 |
| 9 | 10 | 11 ATM Meeting 1930, Paul Lind's House | 12 ○ | 13 | 14 SAC Meeting, GCU 1930 | 15 |
| 16 | 17 | 18 | 19 ☾ | 20 | 21 | 22 DOTM Star Party at Antennas |
| 23 | 24 | 25 | 26 | 27 ● | 28 Thanksgiving Antennas | 29 Star Party at Antennas |
| 30 | | | | | | |

Schedule of Events for November 2008

| | |
|----------------|---|
| Nov. 1st | DOTM Star Party at Antennas: Sunset 1742; Ast Twilight 1906; Moonset 2010; Ast Twilight 5:10 |
| Nov. 5th | Moon at first quarter at 2103mst. |
| Nov. 11th | ATM Sub group meeting at Paul Lind's house |
| Nov. 12th | Moon is full at 2317mst. |
| Nov. 14th | SAC Meeting at Grand Canyon University at 1930, Speaker TBA |
| Nov. 19th | Moon at Last Quarter at 1431mst. |
| Nov. 22nd | SAC Star Party, Antennas, Sunset 1728, Ast. Twilight 1855, Moonrise 0333 |
| Nov. 27th | Moon is new at 0955mst. |
| Nov. 27th-29th | Thanksgiving Star party at the Antennas, Friday: Sunset 1727, Moonset, 1805, Ast Twilight ends 1854, Ast Twilight begins 0552. Saturday: Sunset: 1726, Ast. Twilight ends 1854, Moonset 1858, Ast. Twilight begins 0552 |

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if lumens output comply with lighting laws.

In addition to measuring an object's brightness for magnitude and changes in magnitude, a spectrometer uses diffraction gratings to separate this radiation into measurable spectral components of emission and absorption lines which can be used to determine an object's chemical composition and abundances. It is also the tool for measuring velocities utilizing the Doppler shift of these spectral lines. Almost all professional telescopes are equipped with spectrometers.

A simple but ingenious application of spectrometry was illustrated in the first presentation by Dan Heim and Roger Serrato, founding members of the Desert Foothills Astronomy Club which they chartered with the mission of reducing light pollution. Dan was able to photograph spectra of artificial light sources utilizing his digital camera. He outfitted it with a diffraction grating glued to a lens cap drilled with an appropriate sized aperture hole, and a cardboard tube to extend a slit out to the correct length. From these photos, he could determine which types of light sources scattered the most blue light—the most damaging to the night sky.

After a nice lunch break and brain rest, Stan gave the first of his two presentations. The title, "Preprocessing and Flux Calibration" was a little scary, but Stan's excellent explanations enabled me to understand the gist of this talk.

Stan described the steps to take to optimize resolution and correct for instrument differences and differences in Earth's atmosphere compared to spectrographers at other locations around the Earth. I learned there are varying degrees of spectra resolution, that low resolution is fine for some applications, and that a wrongly tilted camera or slanted spectrum will reduce resolution. Cosmic rays and sky background are noisy problems that can be ameliorated with flat fields and dark frames, and software like IRIS and CCDSoft.

Gene Lucas gave his "Informal Notes on Astrophysical Topics" including the upcoming September 11-12 occultation of a 6th magnitude star by Asteroid Metis coinciding with an IOTA meeting on the path in Apple Valley CA, new track prediction software, and the Google Earth applications that assist in the coordination and manning of observing stations. He revisited the Orion Nebula's Trapezium variables, noting the newly detected 15 day period of Theta 1C—the star GREATly responsible for illuminating the nebula. And among other interesting doo-

dads, he noted the Society for Astronomical Sciences "SAS" and the AAVSO have teamed up for a joint meeting at Big Bear Lake corresponding to RTMC in May 2009, and that there is a call for papers.

Jeff Hopkins' talk titled "Hydrogen Alpha Wavelength Calibration" taught me that stellar atmospheres absorb H-alpha leaving a signature absorption line on the spectra. Heliocentric calibration corrects for Earth's rotation, which is 874mph at 33 North Latitude. He uses Vspec for wavelength calibration and the LHIRES III spectrograph on his 12" LX200GPS scope at his HPO observatory smack-dab in Central Phoenix. He just published another book, "EPSILON AURIGAE, A Mysterious Star System". This book explains the 27 year period of this variable star and how to contribute to unraveling some mysteries during the next eclipse in 2009-2011

Prior to a potluck BBQ, Stan gave the final presentation with his second talk on his method of calculating equivalent width—I surmised this was a time-saving discovery and well worth looking into if your interest lies along the more serious part of the interest spectrum.

I enjoyed this meeting and learned a lot, while maintaining the not so serious attitude of being amazed by the fact that you can determine star stuff by analyzing teeny rainbows.

We topped off this perfect astro day with the short drive to SAC's Cherry II observing site, where my visual observations were accompanied by a



Left to right: Jeff Hopkins, SAC/Dan Heim, President of Desert Foothills Astronomy Club, & Gene Lucas.

new curiosity of what a spectra of M30 might reveal, how would a spectra of the Carbon star T Lyrae appear, which galaxies are moving toward us, can galaxy inclinations be measured spectrographically by analyzing and comparing spectra from locations on the galaxy? Would an observing project using spectroscopy to locate 90 galaxies representing 90 to zero degrees inclination remain fun for the duration? Will the lightning on the far horizon catch up with our telescopes? Will our '91 SKYGZR's odometer make it to a light-second? Will Rascal get sick from all of these grasshoppers he's eating?

Abstracts of the talks are here: <http://users.commspeed.net/stanlep/Agenda.html> Yahoo group SW-Astrophysics: <http://tech.groups.yahoo.com/group/SWAstrophysics/> Stan Gorodenski's website: <http://users.commspeed.net/stanlep/HomePageNS.html>

Bits and Pisces, Minutes of the September General Meeting

By A.J. Crayon



time.

In the Treasurer's absence the president gave the report as follows; cash on hand \$121.00, checking \$3533.00, income \$1563.00 and expenses \$2795.00.

Steve Dodder discussed a 10" f7 Newtonian reflector he is offering for the sale price of \$1100.00. It includes, amongst other goodies, a rotating ring system and has been 60% refurbished. Steve says he is willing to deliver to not to distant places.

Paul Lind announced there will be no ATM meeting next month.

Upcoming events –

- ★ September 27th, DOTM at Five Mile Meadow
- ★ October 4th, DOTM, possibly at the Antennas site
- ★ There will be no ATM meeting for the month of October
- ★ October 10th General Meeting

In response to a question from Dan Gruber a discussion

Immediately after calling the meeting to order, President Steve Dodder requested visitors to introduce themselves. Upon which 2 did so. There were 31 people present at this

of observing sites in the desert centered around Rick Tejera, Andrew Goodwin, Dick Harshaw and AJ Crayon checking out a site at the end of Vulture Mine Rd and another south of Saddle Mt.

Speaking of the Grand Canyon Star Party at the north rim, Steve Dodder announced that one must have reservations before hand. This is due to the fact there is a limited amount of space for setting up telescopes, so please RSVP to him before hand because, if you show up unannounced with telescope, there may not be room for you to set up.

Wayne Thomas announced that Mesa Community College is setting up a planetarium in their Science Building and is scheduled to open October 10th. There will also be room on the roof of the building for setting up tele-

scopes.

After the break Vice President Jennifer Polakis introduced out speaker Adam Block. His talk centered around a new endeavor at Mt. Lemmon. It is open to the public and includes field trips, observing, and astrophotography. The cost is \$48.00 and includes a light dinner. For more information call Adam at 520.626.8122 or e-mail at SkyCenter@as.arizona.edu and he can answer your questions.



SAC Members pose for Speaker Adam Block's Infrared Camera.

Monthly Trivia Question

OK, we've covered two of the four "Trench" controllers. This month: GUIDO, What did he do?

Last month's Answer: This month, why don't you tell me what "FIDO's Responsibilities were.

FIDO was an acronym for "Flight Dynamics Officer". FIDO was the controller responsible for determining HOW to get from where the spacecraft was now, to

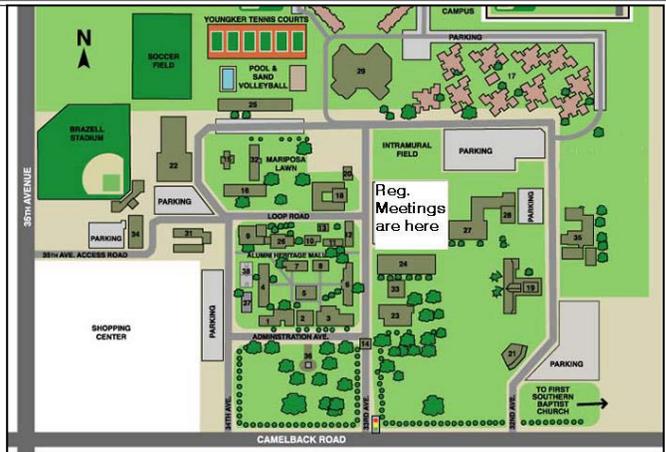
where it needed to be at some point in the future. He was the guy who worked up PADDs for the mid course corrections and the main burns required for TLI (Trans Lunar Injection) & LOI (Lunar Orbit Insertion).

In the movie Apollo 13, FIDO Jerry Bostick (portrayed by Ray McKinnon) is the Flight officer, who during launch Give the O to continue after the second stages center engine shuts down prematurely.

SAC Membership Services

General Meetings

7:30 p.m. at Grand Canyon University, Fleming Building, Room 105: 1 mile west of I-17 on Camelback Rd., North on 33rd Ave., Second building on the right.



Membership Reminder

Just a reminder that memberships expire at the end of December. There is a three month grace period for delivery of SACnews, so use the form on the following page and renew now to avoid any missed issues.

Our esteemed treasurer also advises if you have any magazine subscriptions (S&T or Astronomy, through the club, and the expiration date is Jan 09 or sooner. Now is the time to renew them as the processing takes some time.

Dark of the Moon Star Parties-2008

| <i>Date</i> | <i>Sunset</i> | <i>Moonset</i> | <i>Twilight</i> | <i>Location</i> |
|----------------------|---------------|----------------|-----------------|------------------|
| <i>January 5th</i> | <i>1737</i> | <i>-</i> | <i>1905</i> | <i>Antennas</i> |
| <i>February 9th</i> | <i>1813</i> | <i>2113</i> | <i>1937</i> | <i>Antennas</i> |
| <i>March 8th</i> | <i>1835</i> | <i>2001</i> | <i>1957</i> | <i>Antennas</i> |
| <i>May 3rd</i> | <i>1915</i> | <i>-</i> | <i>2049</i> | <i>Cherry II</i> |
| <i>July 5th</i> | <i>1944</i> | <i>2157</i> | <i>2129</i> | <i>Cherry II</i> |
| <i>August 2nd</i> | <i>1927</i> | <i>2022</i> | <i>2103</i> | <i>Cherry II</i> |
| <i>August 30th</i> | <i>1857</i> | <i>-</i> | <i>2024</i> | <i>Cherry II</i> |
| <i>October 4th</i> | <i>1814</i> | <i>2125</i> | <i>1937</i> | <i>Antennas</i> |
| <i>November 1st</i> | <i>1742</i> | <i>2010</i> | <i>1906</i> | <i>Antennas</i> |
| <i>December 27th</i> | <i>1734</i> | <i>1748</i> | <i>1903</i> | <i>Antennas</i> |

SAC Membership Services

Membership— Memberships are for the calendar year and are pro-rated for new members as follows: Jan– Mar: 100%; Apr– Jun: 75%; Jul–Sep: 50%; Oct–Dec; 25%.

- \$28.00 Individual Membership
- \$42.00 Family Membership
- \$14.00 Newsletter Only
- \$10.50 Nametag for members,
Pinned Clasp
- \$12.50 Nametag for members,
Magnetic Clasp
(will be mailed to address below)

Magazine Subscription Services

The following magazines are available at a discount to club members. Check the magazines you wish to subscribe to or renew, and pay the club treasurer. Please allow 3-4 months for the order to be processed.

- Sky & Telescope \$33.00/yr
- Astronomy \$34.00/yr
- Astronomy \$60.00 for 2 Years

Please Print

Make Check Payable to : SAC

Name: _____

Bring completed form to a meeting or
mail it with your remittance to:

Address: _____

SAC Treasurer
c/o Charlie Whiting
4526 W Purdue Ave
Glendale, AZ 85302

City: _____ **St:** _____ **Zip:** _____

Phone: _____

- Check here if this is an update of information already on file.

E-Mail: _____

SAC on the Internet

SAC has several E-mail mailing lists. To subscribe, send an email to the email address and put **Subscribe in the subject box.**

SAC-Announce@freelists.org: SAC-Announce is a mailing list for just club announcements. Typically 3-5 messages per month.

SAC-Forum@freelists.org: SAC-Forum is a general discussion mailing list. Topics should be related to Astronomy or SAC

SAC-Board@freelists.org: SAC-Board is a mailing list for discussions of club business. If you'd like to see how the club is run (or not run), or have a question about the club, this is the list to read. Typically month to month matters are discussed.

AZ-Observing@freelists.org: AZ-Observing while not a Sac list, is well attended by SAC members. This is the list to with observing places around Arizona. Find out where people are going and what they saw.

Printed Newsletter

SAC can save a lot of money if you download the PDF version of the newsletter. PDF files are readable by both PC's and Macs. When the newsletter is published, a message will be sent to the address indicated above with the URL of the newsletter. Check the box below if you don't have access to the internet or if your prefer a printed copy.

- Please send me a hard Copy of the newsletter

SAGUARO ASTRONOMY CLUB

September 2008

5643 W. Pontiac Dr
Glendale, AZ 85308-9117

Phone: 623-572-0713

Email: newsletter@saguaroaastro.org



Videmus Stellae



SAC Schedule of Events 2008

SAC Meetings

| | |
|---------------------|----------------------|
| January 18th, 2008 | July 11th, 2008* |
| February 22nd, 2008 | August 15th, 2008 |
| March 21st, 2008 | September 12th, 2008 |
| April 11th, 2008* | October 10th, 2008* |
| May 16th, 2008* | November 14th, 2008 |
| June 13th, 2008* | Holiday Party, TBA |

* Rescheduled Meeting Date

Future Planning

| | |
|--------------------------|------------------------------|
| April 5th, 2008 | All Arizona Messier Marathon |
| May 30th-June 1st, 2008 | 5 Mile Meadow Star Party |
| November 28th-30th, 2007 | Autumn Stargaze |

SAC Star Parties

| Date | Sunset | Astronomical Twilight Ends | Moonrise | Site |
|----------------|--------|----------------------------|----------|------|
| Jan 5th, 2008 | 1737 | 1905 | 0608 | A |
| Feb 2nd, 2008 | 1824 | 1929 | 0507 | S |
| Mar 1st, 2008 | 1829 | 1952 | 0346 | S |
| Apr 26th, 2008 | 1911 | 2042 | 0100 | S |
| May 3rd, 2008 | 1915 | 2049 | 0401 | C |
| Jun 28th, 2008 | 1945 | 2130 | 0142 | C |
| Jul 26th, 2008 | 1935 | 2113 | 0021 | C |
| Aug 23rd, 2008 | 1903 | 2033 | 2303 | C |
| Sep 27th, 2008 | 1815 | 1938 | 0455 | S |
| Oct 25th, 2008 | 1747 | 1910 | 0432 | S |
| Nov 22nd, 2008 | 1726 | 1853 | 0331 | S |
| Dec 12th, 2008 | 1730 | 1859 | 0128 | S |

S= Saddle Mountain; C= Cherry Road; A=Antennas