

# The High Desert Observer

The Bulletin of the Astronomical Society of Las Cruces

October, 2008

## Presidential Debate?

Not here, thankfully! We get enough of that on TV. Often our Society has the opposite problem – just finding folks willing to be our officers. The truth is, having a good support team like we have this year makes being President or VP rather pleasant. Keep that in mind when Bert Stevens, our nominating chief, comes calling.

Another September is behind us, and along with it WSSP IX, which had a new flavor this year along with the usual ups-and-downs. Thanks to our various members who helped make it the successful astro-gathering it always turns out to be.



Planning is underway for our club to run a “scopes & accessories” garage-sale (part of the Herron estate), probably on the 18<sup>th</sup> of October. Put that on your calendars if you are willing to help and/or have an interest in some bargains on nice astro-hardware (who doesn’t!). I will provide details as plans are firmed up.

Now we come to the main event that will make this October extra special – our regular meeting! How will that be, you might ask? Well, there won’t be anything regular about our meeting on the 24<sup>th</sup>. First of all, it will be held at the gorgeous hacienda of Mike & Carol Sherick, and will focus on “food, fun & robotic imaging.” There will be tasty refreshments, home & remote observatory tours & demos, a presentation by Mike on robotic imaging, Q&A, and even eye-candy views on the observing deck. This will be a blast, ladies & gents, something for everyone. For more info see the announcement article inside, or contact me. Please make a special effort to come out – you’ll be glad you did.

Last but not least - Ren Faire is coming soon! November 1 & 2 are the dates, obviously before the next HDO comes out. So be aware that we need volunteers to set-up & man our booth. More specifics will be forthcoming via the ASLCNM group – overall our plan is to duplicate our successful effort last year – telescopes, images, hand-outs. It’s fun & rewarding whether you help a little or a lot, so let the ‘ancient astronomer’ in you come forth! Remember, this outreach event is our single best annual activity to really let Las Cruces know what our Society is about.

Isn’t October just the best month all year for doing astronomy?! Many think so, so get out there & let’s have some Stellar Stargazin’! — Nils

*P.S. - So have ya’ll gone to the website to check out IYA 2009? [www.astronomy2009.org] I hope so – some intriguing initiatives are presented there. It will be fun to see how the ASLC can get involved & benefit from this powerful international drive to bring astronomy to “the people.”*

The Astronomical Society of Las Cruces (ASLC) is dedicated to expanding members and public awareness and understanding of the wonders of the universe. ASLC holds frequent observing sessions and star parties, and provides opportunities to work on club and public educational projects. Members receive *The High Desert Observer*, our monthly newsletter, membership in the Astronomical League, including AL's quarterly *A.L. Reflector*. Club dues are \$35 per year. Those opting to receive the ASLC newsletter electronically, receive a \$5 membership discount. Send dues, payable to ASLC with an application form or a note to: Treasurer ASLC, PO Box 921, Las Cruces, NM 88004.

ASLC members are entitled to a \$10 discount on subscriptions to *Sky and Telescope* magazine.

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## Next Meeting

The October meeting is being held at the home of Mike and Carol Sherick. See the enclosed article on page 6 for a locator map and meeting details. Mike will be giving a presentation on robotic observatories.

Due to the unusual location and format of the next gathering there will be no Astro-Tidbits meeting.

Other events planned for October include:

**ASLC MoonGaze at the International Delights Cafe, Saturday, November 8th, at dusk.**

**Dark Sky Observing at the Upham dark sky site, Saturday, October 25th, at dusk.**

Please see the ASLC website for further information:

<http://www.aslc-nm.org>.

## November Issue of the *HDO*

Articles for the November issue should be sent to Tony Gondola by Friday, October 10th. Text should be sent as email (acgna@comcast.net) or as an attached Microsoft Word document. Images should be sent in jpg format.

If you have any questions about submitting something to the *HDO*, please don't hesitate to contact me at 571-5118 or via email. Thanks in advance! Tony Gondola, Editor, ASLC Newsletter

# Minutes, September 2008 ASLC Meeting

## **Call to Order:**

Nils Allen, President, Astronomical Society of Las Cruces (ASLC), called the meeting to order at 7:35 pm., 19 September 2008, Rm. 77, Dona Ana Community College.

## **President's Comments:**

Nils Allen, Club President, welcomed the group and noted that no visitors were in attendance. He also elaborated on why the September meeting was being held one week earlier than usual (see White Sands Star Party below).

## **Secretary's Report:**

The minutes for the August meeting were submitted as published in the current issue of the Club newsletter, the *High Desert Observer (HDO)*. A motion to accept the minutes as published and dispense with the reading of same was offered by Rich Richins and seconded by Bill Stein. The motion passed by acclamation of the members present. There was not an additional secretary's report.

## **Treasurer's Report:**

The treasurer was not present at this month's meeting. There was not a treasurer's report.

## **Committee Reports:**

### **Observatory Committee:**

There was no progress to report.

### **White Sands Star Party (WSSP) IX, 26-27 September 2008:**

See Announcements below for an update.

There were no additional standing committee reports.

## **Old Business:**

1. Meade SolarMax telescope – no status update was available because of the treasurer’s absence. For the time being, once the scope is delivered, usage will be coordinated through the Board of Directors.

There was no additional old business discussed.

## **New Business:**

1. Nominating Committee – A slate of candidates for the 2009 calendar year is needed. Bert Stevens has agreed to chair the committee. Rich Richins offered a motion to allow Bert to form the nominating committee, George Hatfield seconded. After brief discussion, the motion was called and carried by acclamation of the members present.
2. Renaissance ArtsFaire, 2008 – This year’s Faire will be 01 & 02 November at Young Park. Nils Allen has completed the administrative part of arranging the Club’s participation. He needs team captains to volunteer to handle other tasks. Rich Richins will print information fliers and set up a C-11 scope for daytime planetary viewing. Steve Barkses will transport the display panels and coordinate set-up and tear-down of the Club’s booth. Bill Stein will provide a PST for solar viewing and may also contact Richard Jones to borrow his PST for the event.
3. School outreach – Rich Richins reported that 191 Las Cruces Public Schools teachers and staff have signed up to receive the Club’s AstroAlerts. He has also received requests from teachers for Club members to address individual classes during the day. He especially needs someone to partner with the 4<sup>th</sup> grade class at Alameda Elementary. Anyone who can help, please contact Rich.
4. *HDO*, Club newsletter – Tony Gondola has edited the August and September issues and will also edit the October issue. He may take on the editor tasks long term.

There was no additional new business discussed.

## **Announcements:**

1. Member updates – Chuck Sterling was present at the meeting and reported his daughter Melissa’s prognosis (leukemia) is good.  
  
Cecil Post was present at the meeting despite suffering a serious fall earlier in the week.
2. Astronomy equipment – There will be an astronomy equipment “garage sale” of Phillip Herron’s remaining equipment sometime in October. Nils Allen is working with Phillip’s ex-wife and will provide details via the Club’s yahoo group.
3. Christmas Party/December meeting – Nils Allen would like to start organizing/planning the December event as soon as possible and asked for volunteers. The meeting room at Furr’s cafeteria is a possibility.
4. White Sands Star Party, 2008 – Several Club members plan to attend. The mini-workshops and presentations by Club members are set. There is a good article describing the event in the current issue of the *HDO*. The main speaker for the event will be Steve Landeen, NM spaceport director. There will be IMAX and Space Museum tours available and several prize drawings, including a plug plate from the Sloan Digital Sky Survey.

5. Southern New Mexico Star Party (SNMSP) – SNMSP at City of Rocks State Park is planned for 24-28 September. The event is co-sponsored by National Public Observatories (NPO) and ASLC.
6. Club spring outing – a possible outing/star party in the Datil/Pie Town area in May 2009 is being considered. This event may develop into another state-wide dark sky event.
7. IYA 2009 NM Planning meeting – A planning meeting for state-wide and regional events for next year's IYA will be held 28 September at the NRAO facility in Socorro, NM. Contact Nils Allen if you can/would like to participate.
8. MoonGaze - A monthly MoonGaze was held 06 September at International Delights Café on El Paseo. The October MoonGaze will be 04 October, weather permitting.

There were no additional announcements made.

### **Observations:**

No observational reports were presented.

Rich Richins offered a motion to adjourn and Bill Stein seconded. The business portion of the meeting was adjourned at 7:51 pm by acclamation of those present.

### **Presentation:**

This month's program was presented by Nils Allen, Club President. His topic was "The Universe, Yours to Discover," the theme of International Year of Astronomy (IYA) 2009. He presented highlights of the global and local aspects of IYA 2009 and noted that more details are available at [astronomy2009.org](http://astronomy2009.org). He shared a pdf presentation that is available from the website, including the eleven (11) Cornerstone projects of the international effort. He reiterated the need for a Club representative to attend the New Mexico state-wide meeting in Socorro on 28 September. This presentation was recorded for rebroadcast on the Internet. It and other meeting presentations can be accessed on the web at <http://www.aicsresearch.com/lectures/aslcnm/>.

The September 2008 monthly meeting concluded at 9:05 pm.

-Respectfully submitted by John McCullough, ASLC Secretary

## ASLC October “Special” Regular Meeting, a bit different.

I know – it’s sounds confusing. But read on – you’ll be glad you did. This October 24<sup>th</sup> will be fairly unique for an ASLC monthly meeting – think Astronomy Extravaganza! Below are the essentials to remember, with more detailed info after:

WHERE: 5626 Tierra Sagrada, the Sherick hacienda (see map insert on following page), tel. 575-680-2788.

WHEN: Activities start at 6:30 pm, and could last as long as 10 or 11pm.

WHO: Visitors, members & their families are invited. Our hosts are Mike & Carol Sherick.

WHAT: Snack, visit, tour, listen & learn, remote image, watch astro DVDs, observe, relax.

HOW: Large house at a dark site, beautiful patio, home observatory, 2<sup>nd</sup> story observing deck.

WHY: Why not break out of our meeting “rut” and do something different!

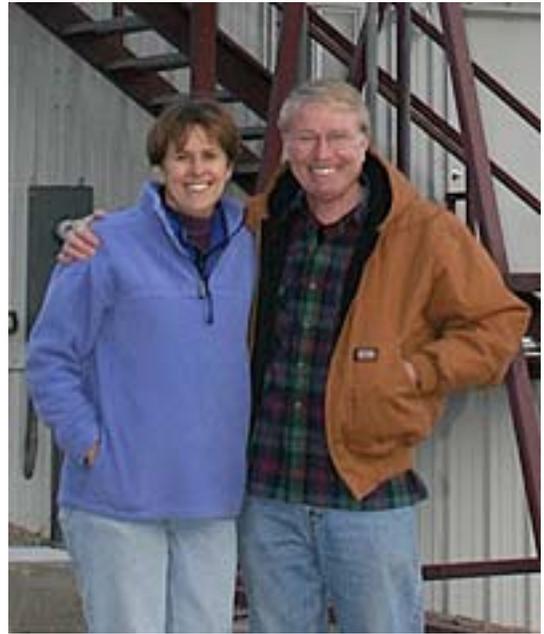
Ever attend an ASLC monthly meeting where you snacked on goodies and could enjoy the stars overhead as you listened to the speaker? No problem this month. Mike & Carol Sherick have been wanting to share their new astronomy-friendly home south of town with club members for awhile, and I have been wanting to have Mike give us a thorough presentation on his cutting-edge work with robotic observatories. So we combined these desires and added in a social aspect, etc.

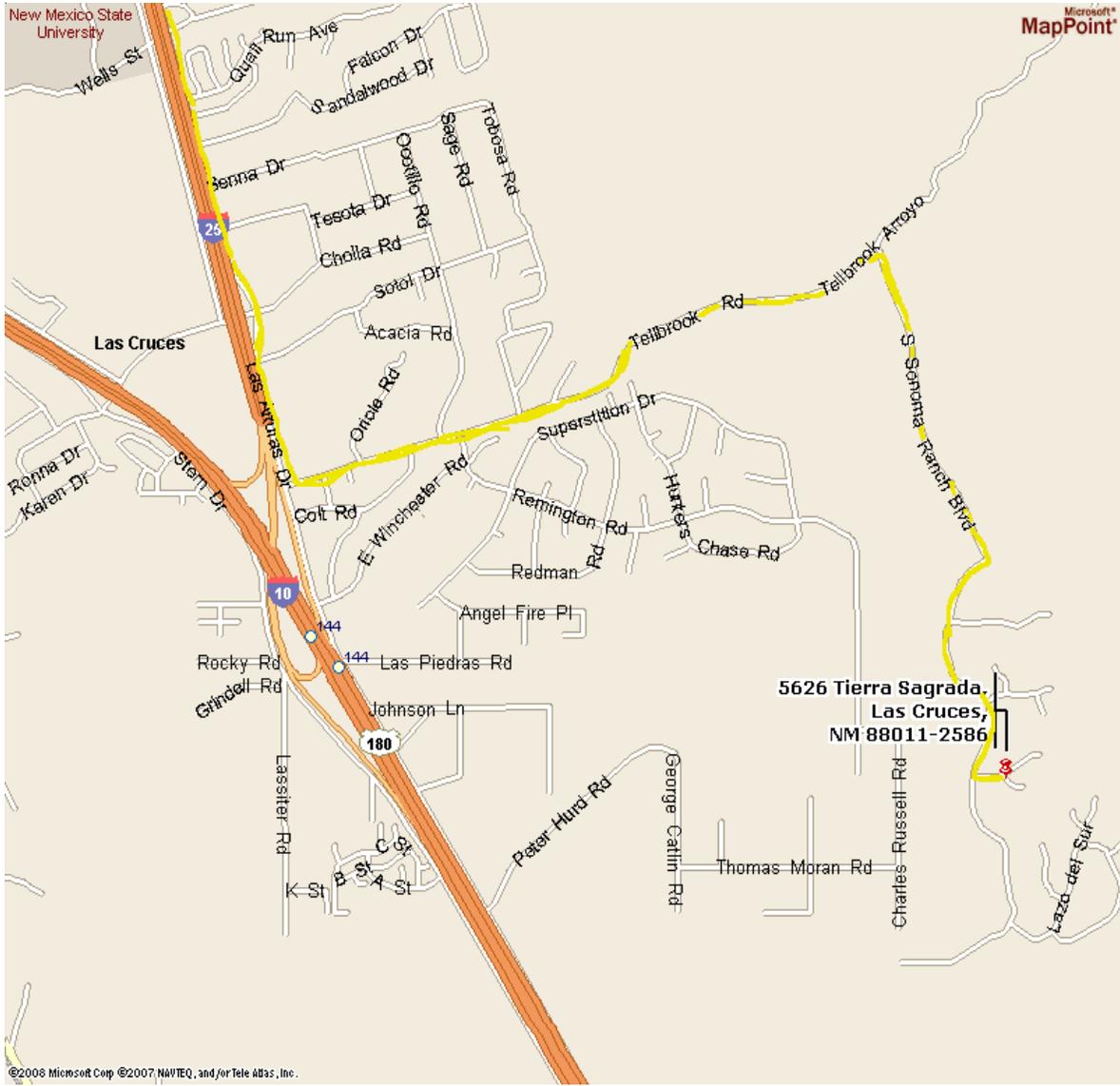
Mike & Carol’s home is eye-candy by itself, including the semi-enclosed patio and home observatory. Bring a sweater or jacket to keep you cozy on the patio - if the weather turns bad we can meet inside (but it won’t be as much fun). After visiting & looking around, we’ll have a *short* business meeting before Mike speaks on Robotic Observatories for CCD Imaging: how to enjoy astronomy & still get good sleep. Then we’ll have Q&A, possible hands-on demos and an aside on “R-C design & construction.” Various astronomy DVDs will be playing inside if anyone isn’t excited about robotic imaging. When our main activities wrap up around 9 pm, folks are welcome to stay till around 11pm and play with the software, observe visually from the deck, or eat, watch videos, etc, as you desire.

A few additional practical matters to remember: if you have nice folding chairs, please bring them (some will be provided). If you arrive after 7:30 pm, call for entry instructions. We’ll put out a few signs at the last few turns. Parking – the roomy driveway will hold several cars (go ahead & double park), the street is available. Use of a flashlight after dark is recommended due to the occasional snake warming itself.

This should be great fun, folks, so make a special effort to come out & enjoy the Sherick’s hospitality. See you there!

Nils





5626 Tierra Sagrada

575-680-2788

Link to MapQuest File:

<http://www.mapquest.com/maps?address=5626+Tierra+Sagrada%2C+Las+Cruces+NM#a/maps/m::11:32.25609:-106.714617:0::/e>

Directions: from University head south 2 miles on Las Alturas; turn east on Tellbrook and go uphill about 2 miles. Turn right (south) on to S. Sonoma Ranch Blvd (the only good choice) and go a mile to Camino Escondida where you turn right (only choice, SRB ends). Go 0.7 miles to Avenida Sonrisa, turn left (through gate). Mike's house is the second one, on the right.

## Variable Stars, Part 5

### How Amateur Astronomers Contribute

By Bill Stein

Since the early days of the telescope, amateur astronomers have contributed to the study of variable stars. As I mentioned previously, the young English amateur astronomer, John Goodricke (1764-1786), was the first to propose a mechanism to explain the variability of Algol based on his visual observations. Today, there are many organized groups of both professional and amateur astronomers who work in collaboration to observe and analyze variable stars. In this way, amateur astronomers can contribute to the advancement of astronomy and, potentially, become co-authors on published technical papers. The organization most familiar to amateur astronomers in the US is the American Association of Variable Star Observers (AAVSO). In addition, there is the Center for Backyard Astrophysics (CBA) and the Society for Astronomical Sciences (SAS). You will find many useful articles and information tips at these organizations.

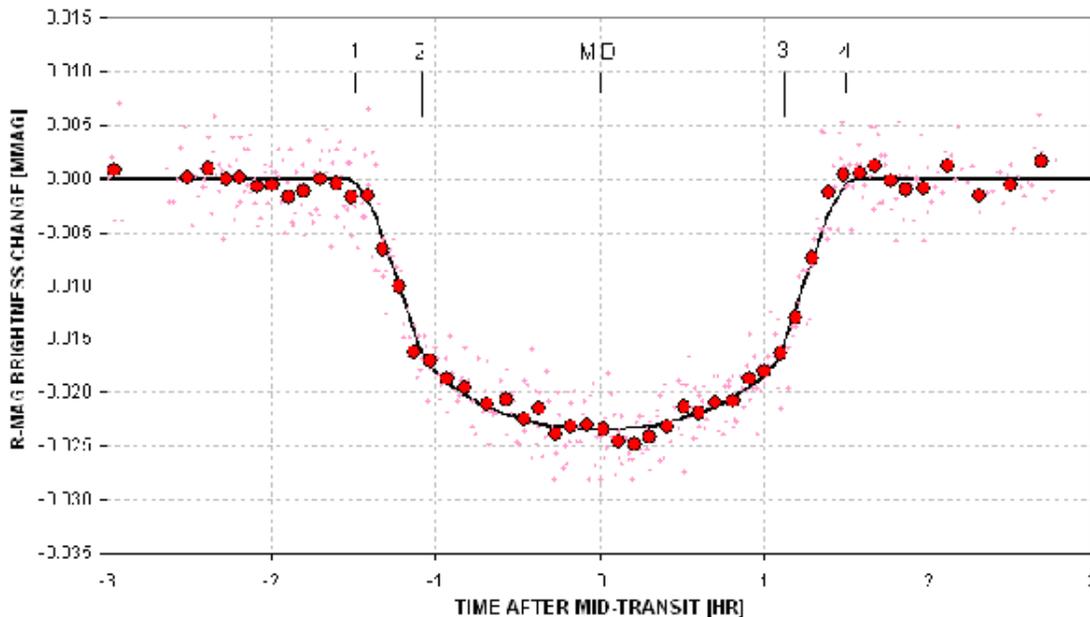


Figure 1. Exoplanet Light Curve

If the study of variable stars interests you, then you may ask, “How can I contribute?” Amateur astronomers may contribute using a variety of telescope sizes and sensors or cameras. If you are on a budget and do not wish to invest or take the time to learn how to use advanced instruments, then observing variable by visual methods is for you. If you wish to observe some of the more difficult fainter objects or those with small variations in magnitude (such as exoplanet eclipses which show variations below a tenth of a magnitude, see Figure 1), then you need to invest in a good scientific quality CCD camera and the associated scientific filters. However, there is a role for visual observations. As the AAVSO points out, CCD and visual variable star astronomy are collaborative and not competing endeavors.

Visual observations are quick and easy, and involve less equipment and less expense. However, the visual observations cannot go as faint as CCD observations nor can they provide the extreme precision needed for certain types of observations. The CCD observations provide improved accuracy, can go much fainter and can be automated. On the down side, CCD astronomy is more time consuming, is more complicated and involves more equipment and expense.

Recently, I have begun observing variable stars with my C14 telescope and SBIG ST10XME CCD camera. Also, I have procured a set of BVRI filters from Custom Scientific. This filter set is what is recommended by the AAVSO to support scientific observations of variable stars. The BVRI filters are commonly used as the standard filter set by professional astronomers. Taking observations with these filters ensures that the variable star observations can be combined with observations from other observers as long as the comparison stars have known BVRI magnitudes. The AAVSO provides finder charts for the variable stars along with comparison stars. The known BVRI and JHK magnitudes of the comparison stars are provided by the AAVSO along with the finder charts. Thus, I can either observe a variable star differentially with comparison stars or absolutely with BVRI transformation coefficients. The differential technique is less complicated than the absolute technique which requires one to establish transformation coefficients for the system (telescope, camera and filters combination).

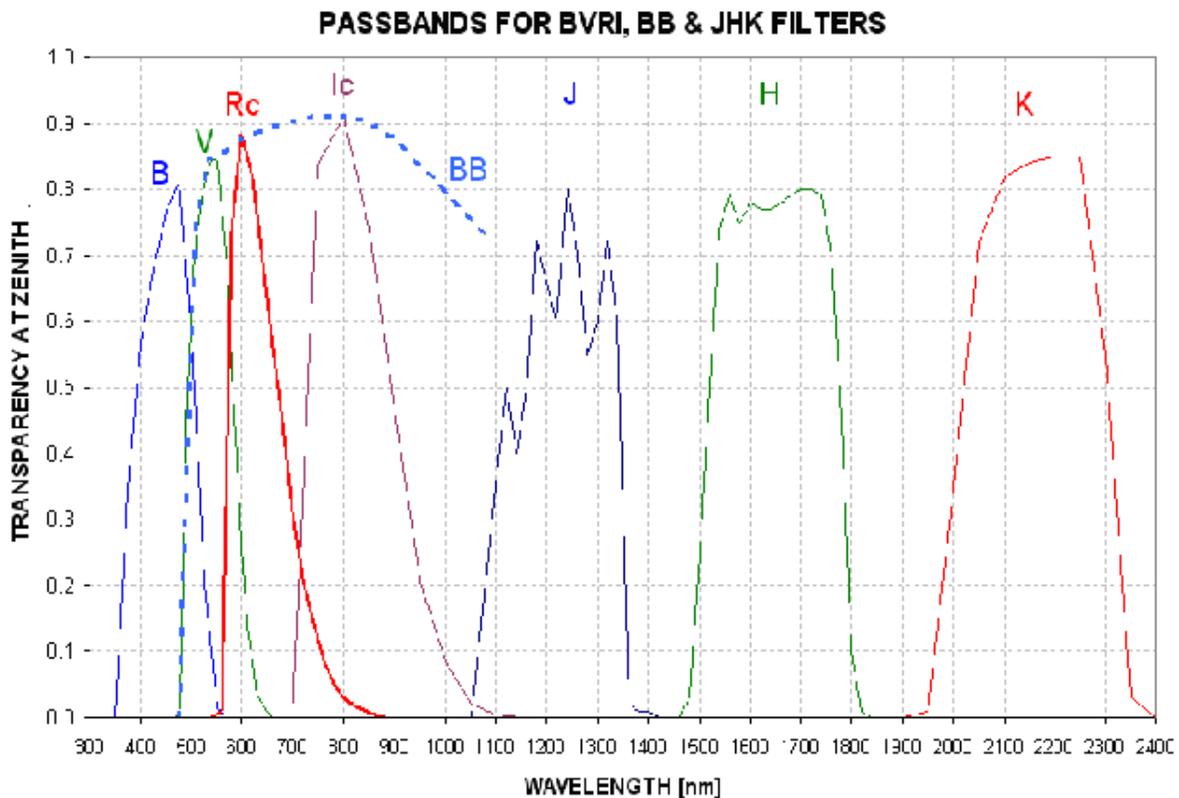


Figure 2. BVRI, BB, and JHK filter response curves

Figure 2 shows the spectral response of the filters used for variable star observations. The filters are based on the Johnson-Cousins system where BVRI stands for Blue, Visual, Red and Infrared while BB stands for Blue Blocking. The JHK are further in the infrared and require a different camera that is more sensitive in the infrared. Most amateur astronomers do not have equipment to use in this part of the spectrum.

I have been concentrating my observations on a type of variable stars known as cataclysmic variables (CV). The CVs are binary star systems which have a white dwarf and a normal star companion similar to our sun. The white dwarf is often called the primary star and the normal star is the secondary or companion. The secondary star has filled its Roche lobe and, consequently, loses material onto the white dwarf through a process called accretion. In many cases, the white dwarf develops an accretion disk around it. Sometimes, outbursts occur as the accreted material causes a sudden nuclear fusion of hydrogen-rich material on the surface of the white dwarf. This fusion causes what is known as a dwarf nova outburst. Some CVs are eclipsing and we can see the eclipse of the white dwarf and the accretion disk. The SX Sextantis group is this type of system and they have eclipse periods on the order of hours.

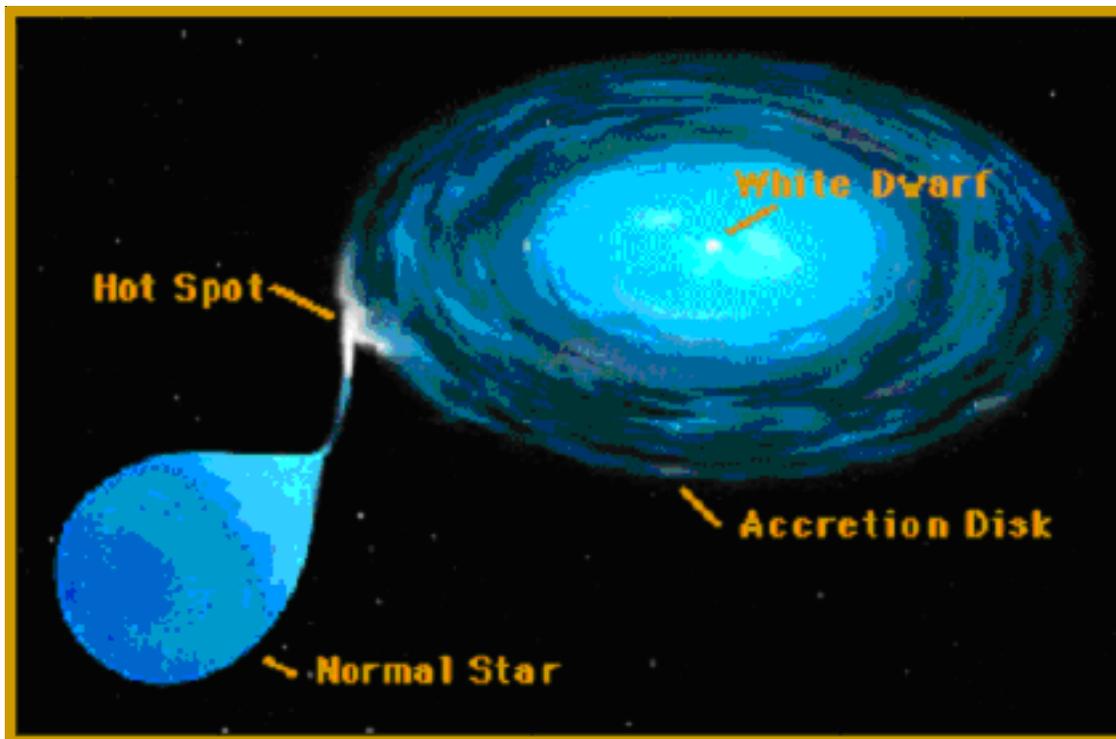


Figure 3. Cataclysmic Variable Model

When I observe a CV, I must take individual observations over a short time, usually over exposure times of sixty seconds or less. Thus, a single night can have many hundreds of images. In addition, since we want accurate measurements of magnitudes (a technique called photometry), I must ensure that I have taken both dark images and flats to support the accurate photometric analysis.

Generally, I take 25 darks and flats. The darks must be taken at the same temperature and exposure as the observations while the flats are taken to allow about 50% response of the peak camera response (about 32,000 ADU for my camera). I can create master flats and darks to apply for other nights as long as the temperature and exposure is the same for another night's observations for darks and as long as the camera orientation has not changed for the flats. Figure 4 shows typical a typical flat and dark image.

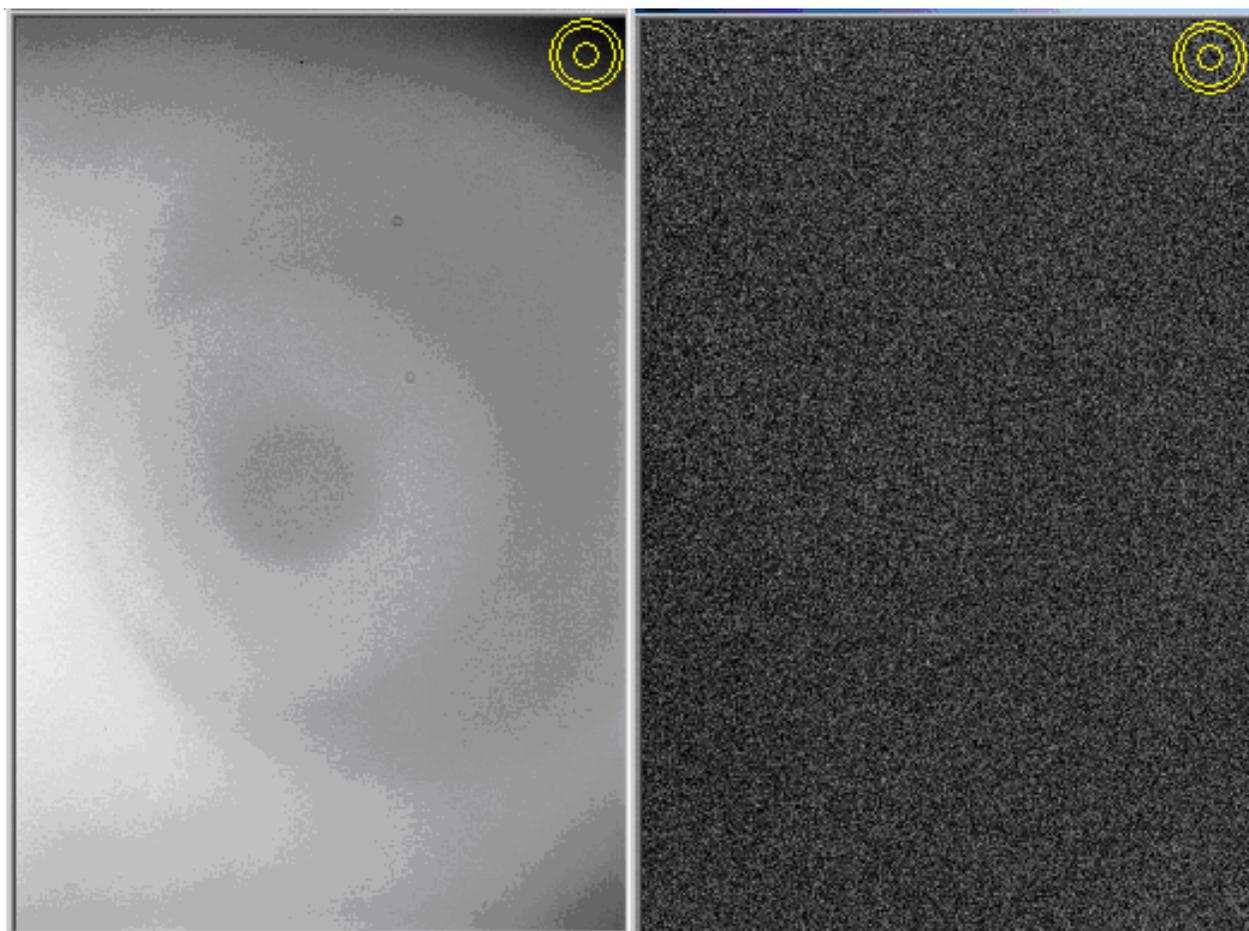


Figure 4. Flat field frame (left) and dark frame (right) for I filter

After the observations have been obtained, then I need to reduce the observations and provide the results to one of the requesting organizations such as AAVSO or CBA. The program I use for the photometric reduction of the variable star observations is AIP4WIN V2.0, purchased from Willmann-Bell. Of course there are other software packages one could use instead of AIP4WIN, such as Maxim DL or Canopus. For me, the AIP4WIN software works very well and you can obtain a lot of statistics about your image and the objects in the image such as signal to noise ratio (SNR) and Full Width Half Maximum (FWHM). Typically, I need to examine a few of the images to determine the photometric settings, including the star aperture size and the sky annulus for the target objects. The SNR and FWHM help in deciding what are useful images and the accuracy of the photometric measurements.

Figure 5 shows a typical image ready for measurement using Maxim DL.

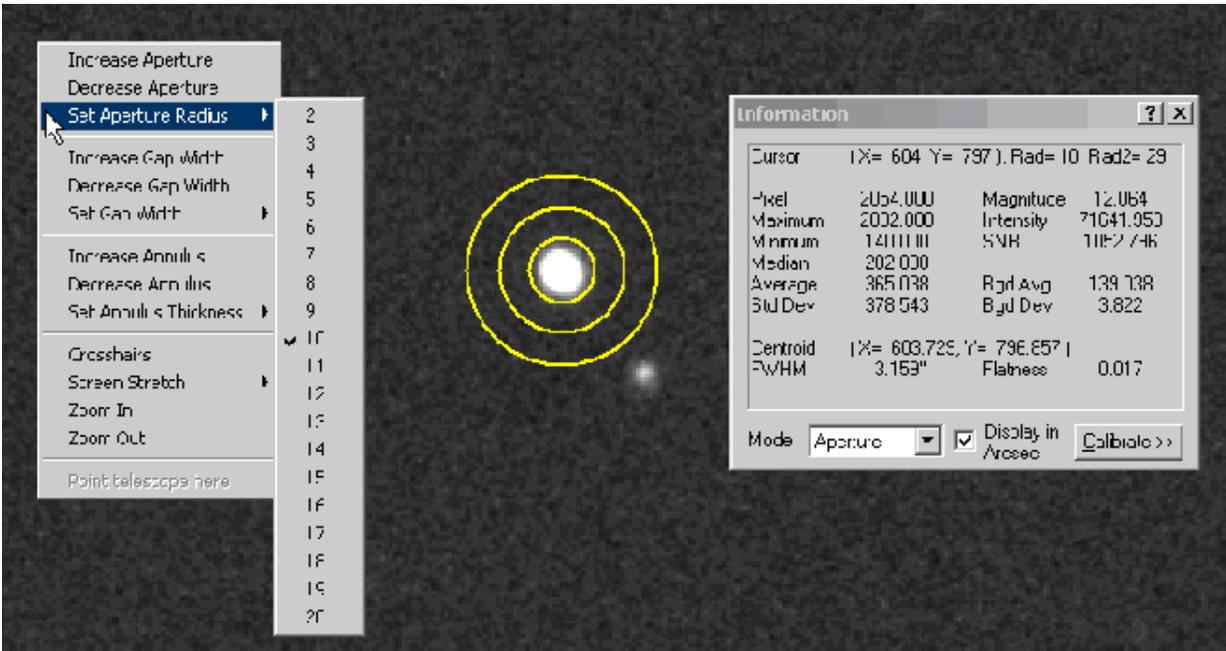


Figure 5. Setting the aperture and annulus for photometry

In general, I find that CCD analysis of variable stars is very rewarding. I would recommend that amateurs get more involved in this area because of the contributions and collaborations one can make to astronomy. However, even if you are interested in other areas, the references I have cited below for AIP4WIN and Bruce Gary would be useful for deep sky imagers. Bruce's book, *EXOPLANET OBSERVING FOR AMATEURS* is free on his website and contains lots of useful information.

Some Websites:

AAVSO: <http://www.aavso.org/>

CBA: <http://cbastro.org/>

SAS: <http://www.socastrosci.org/>

Exoplanet TransitSearch: <http://www.transitsearch.org/>

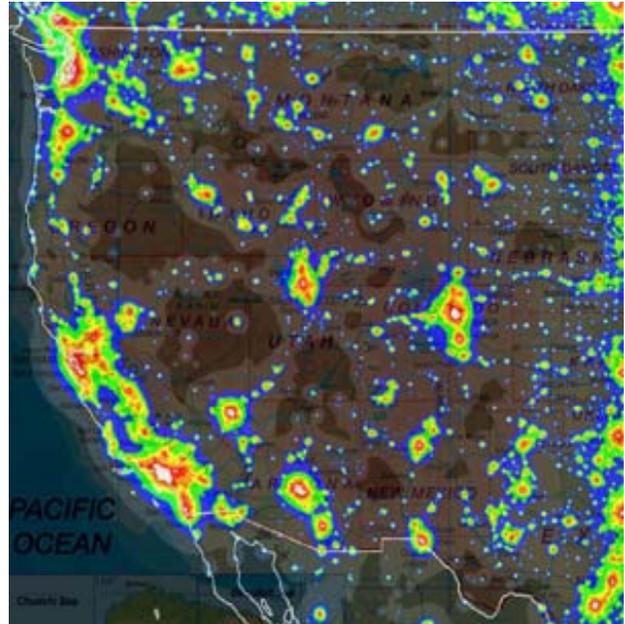
Bruce Gary: <http://brucegary.net/AXA/x.htm>

AIP4WIN: <http://www.willbell.com/aip/index.htm>

## In Search of Darker Skies

By George Hatfield

I became interested in dark sky areas earlier this year after visiting the website for the Light Pollution Science and Technology Institute (ISTIL- Istituto di Scienza e Tecnologia dell'Inquinamento Luminoso). Their home page can be found at <http://www.inquinamentoluminoso.it/dmsp/index.html>. This nonprofit Italian organization develops and promotes scientific research on light pollution. Using night time images of the Earth obtained from the Defense Meteorological Satellite Program (DMSP) and computational methods designed to show the impact of light pollution, ISTIL has produced maps of "Artificial Night Sky Brightness" for most of the world. One of these covers the United States. I was able to overlay their map with one of the western US so that the location of the darkest sites could more easily be approximated. My overlaid map has somewhat different colors than the ISTIL maps, but generally speaking the dark brown areas are the regions least impacted by light pollution and thus provide the darkest skies.



*ISTIL Artificial Night Sky Brightness image of the western US overlaying a map of the same area*



*The "Silver Twinkie" at the Montosa RV Park near the VLA*

In New Mexico one of the darkest sky areas is located near the Very Large Array (VLA) radio telescope facility, about 50 miles west of Socorro, NM, on Highway 60. In early June of this year, my wife Pat and I hooked up our Airstream and visited the area to judge its suitability as a possible site for a future star party ([http://www.geoandpat.com/Georgesastro\\_darksky.html](http://www.geoandpat.com/Georgesastro_darksky.html)). We camped a few miles to the east of the VLA in the Montosa RV Park and were there for a couple of nights. I can say that I was "blown away" by the quality of the night sky. It was like nothing I had seen before, including the sky at the TSP in 2007. The Milky Way was vivid, for lack of a better word, and had a cloud-like appearance with dark lanes clearly visible. As for stars, there were so many that common constellations were difficult to pick out. It seemed like it took several minutes to pick out the Little Dipper and Polaris. At

one point I had to defocus by taking off my glasses to find a constellation! All of the stars of the Little Dipper were visible with direct vision (faintest magnitude 4.95). That time of year Sagittarius was fairly high in the southern sky when I went out about 2 am. I was surprised that I could see M7 without the aid of a telescope.

These subjective descriptions do give a general impression of how dark the sky was, but is there a way to quantify the darkness of the sky? John Bortle published a dark-sky scale in *Sky & Telescope* some time ago (October, 2000: see [SkyandTelescope.com](http://SkyandTelescope.com) for a reprint).

It is certainly useful and I'd say the sky above the Montosa site was probably between Class 1 and 2. However, this scale is still based on a subjective evaluation of the sky by the observer.

A somewhat more quantitative way of evaluating the darkness of the sky is to determine the magnitude of the faintest star visible to the naked eye. However, this approach has the limitation that one person's magnitude-5 sky might be another's magnitude-6 due to differences in visual acuity between individuals. When I'm out observing the first thing I typically look at, to judge the quality of the sky, is the Little Dipper. If I can see all its stars, even with averted vision, it's a good night in terms of darkness and transparency. With my eyes I can rarely see anything fainter than magnitude 6, but there are reports of individuals seeing magnitude 8 stars under excellent dark sky conditions (<http://www.astronexus.com/node/45>).



*Sky Quality Meter*

Fortunately, there is an instrument that can be used to measure the darkness of the sky in quantitative terms, and that is the "Sky Quality Meter" (see <http://unihedron.com>). This photometric instrument measures the sky in terms of magnitudes per square arcsecond of sky, which is a fairly common unit used in astronomy for this purpose. It took me awhile to appreciate this unit of measure. Basically, a reading of 20, for example, would represent the light from a magnitude 20 star spread over one square arcsecond of the sky. As with star magnitude, the larger the number from the Sky Quality Meter, the darker the sky. The Unihedron website has a database of readings that have been submitted by users of the meter, and these vary from 12 for very light-polluted areas to over 23

for the best dark skies. According to the website, readings over 22 are rare. Jerry Lodrigus ([www.astropix.com](http://www.astropix.com)) has an interesting article on "The Brightness of the Night Sky" and cites the following readings from some observatory sites: Mount Wilson (19.8), Palomar Mountain (21.5), Lick Observatory (20.7), and Lowell Observatory (20.5). If you are interested in more information on how the Sky Quality Meter works, Chuck Bueter has some informative illustrations on his website (<http://www.nightwise.org/sqm.htm>).

Unihedron now markets several models of the Sky Quality Meter. The original model measures light from a cone of the sky that is about 80 degrees wide and thus it is necessary to point the meter toward the zenith at arm's length to ensure the relatively wide measurement cone is unobstructed. Once the red button is pushed, the meter provides a digital reading of the sky in a few seconds. The wide measurement cone does present a problem when measuring the sky in confined areas (e.g., in an area with a lot of tall trees). A newer model is now available which has a more focused cone of about 30 degrees. See the Unihedron website for additional information. The meters run from \$120 to \$135.

Fortunately, one of our members, Vince Duvydaitis, purchased one of the original meters and loaned it to me to take some readings during an RV trip that my wife and I took in August. During our month-long tour we visited six national parks and some of them were located in or near the darkest sky areas of the western US. The first part of our route took us up to Canyonlands and Arches National Parks in southeastern Utah, then north to Yellowstone and Grand Teton National Parks in Wyoming. Unfortunately, the weather was not cooperative in Canyonlands and Arches, but in Yellowstone, the reading in our RV park near West Yellowstone, MT was 21.4. The moon was out most of the night in Grand Teton, so I didn't get any readings from that area. But Grand Teton is a wonderful place otherwise and one of the most scenic we visited.

Both the moon and weather cooperated when we visited Bryce Canyon (21.6) and Zion (21.4) National Parks in Utah. The park rangers at Bryce have a very active astronomy program (<http://www.nps.gov/brca/planyourvisit/astronomyprograms.htm>) and while at the park we attended an interesting talk on recent planetary studies by astronomer Patrick Wiggins from the University of Utah.

His presentation was followed by a star party hosted by the Bryce rangers. Following the star party, Pat and I drove out to a remote site in the park (Paria View) where I took the reading. The sky was spectacular to say the least and very similar to what I described above for the VLA site in New Mexico.

For Zion we actually left the park and took a back road that runs along the west side of the park. It was very dark, but the readings were not as good as those we got in Bryce. The sky was beautiful though and the sunset was a wonderful sight. A panorama image of the sunset that night can be seen on our website [www.geoandpat.com](http://www.geoandpat.com) under panoramas. All in all, it was a wonderful night. That sunset drive out Kolob Road, which leaves from Virgin, UT, was one of the most beautiful of our trip.

From Zion National Park we traveled to Jacob Lake, AZ, to visit the north rim of the Grand Canyon. On the way we spent a night in Flagstaff. We stayed on the northeast side of town in a location that was somewhat shielded from the lights of the city by Elden Mountain. The reading there was 21.1 which is quite dark for a semi-urban area. However, this reading may not be reliable since I was in a fairly forested area and even at arm's length, the 80 degree cone may have been blocked somewhat by the trees.

Jacob Lake is about 40 miles north of the Grand Canyon National Park's northern entrance and I took my readings for this area about 10 miles south of Jacob Lake, just off the highway. It was late at night and the sky was wonderfully dark. I was hoping to get a reading over 22 and at first I thought that was going to happen. The darker the sky the longer the meter takes to complete its reading. As it is collecting photons, the meter clicks and it kept clicking and clicking. Finally, I lowered the meter and took a look. It was then that I realized that I had the meter pointed at the ground! I tried again and got several readings around 21.7, which it turned out was the best of the trip. It should have been, since I was many miles from any significant light pollution.

From the Grand Canyon we headed toward home via Gallup, NM. To break up the drive to Las Cruces we decided to spend the night in Montosa RV park near the VLA. So we headed south on Highway 117 from Grants, NM. This is a very scenic drive along the El Malpais lava flow which took us down to Quemado, NM, and to Highway 60. From there we headed east to the RV park where we had stayed in June. I didn't think the weather was going to cooperate with any viewing of the night sky since it was cloudy most of the day, but by about 3 am, the sky was clear and similar to what I saw in June. The reading was 21.7 which tied for the best of our National Park readings. So, you don't have to go far to experience some of the darkest skies in the US (just 185 miles and about 3 hours drive)! And you can have some pie in Pie Town while you are at it.

Finally, to put things in perspective, what are the readings from the Sky Quality Meter near Las Cruces? I've taken several readings near my observatory in the Talavera area (to the east of A Mountain) and all are around 20.5 on a dark, clear, moonless night. That is only about one magnitude difference from the best skies I have measured and should correspond to 2.5 times less light per square arcsecond of the sky. But what does that really mean in terms of what one will see? To my eyes, the Milky Way here is more of a light "fog" in the sky than the "clouds" I saw in the dark sky areas we visited. Constellations are easy to pick out because the number of stars is so much more diminished and only the three brightest stars of the Little Dipper are visible with non-averted vision. Thus, one magnitude difference in the meter reading represents a big difference, at least to my eyes. Jerry Lodriguss has some nice pictures on his website which show the difference in what one will see in a truly dark site and those that are light polluted. They can be found in his article on "Light Pollution and Observing Sites" on his website (<http://www.astropix.com>). It really is an amazing difference.

Finally, I found a very interesting website concerning an exploration of astronomy in American's National Parks. Astronomer and physics professor Tyler Norgreen visited twelve parks in twelve months starting in July 2007 and ending this past August. His tour represents a much expanded version of what I described above. The website is

[http://www.planetary.org/explore/topics/how\\_it\\_works/planetary\\_analogs/parks.html](http://www.planetary.org/explore/topics/how_it_works/planetary_analogs/parks.html).

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## News from member Tom Krajci

*This might be of interest to folks who are curious about photometry, but don't want to buy a CCD, computer, rig up a network, do image processing, etc. They spend more time under the stars, not at a computer. Instead, they can get a photoelectric photometer for free!*

*Email from AAVSO director is below....*

-----Subject: [AAVSO-DIS] Rejuvenation of the PEP team  
To: AAVSO-DIS

Matt Templeton and I have noticed that the number of PEP observations has decreased dramatically over the past year. I want to remind people that PEP observing is still viable and extremely valuable for many of the stars that have been traditionally on the AAVSO programs. As an example, the upcoming eclipse of eps Aur is a great opportunity for high-quality PEP observations, and I'll soon announce a continued campaign for P Cygni.

PEP observing is simple, requiring no flatfielding or image processing, and can be accomplished even without a computer or software. You can write down the raw numbers displayed on an SSP-3 photometer and upload those measures directly through WebObs - we'll take care of the processing. PEP is ideal for visual observers who wish to extend their skills to digital photometry; to those who are computer-illiterate; to those who really prefer to be out under the night sky; for observers interested in variable-star prototypes like Mira or delta Cep. Many of the targets of amateurs with spectrographs are bright stars, so you can help them in understanding their observations. The drawback of PEP observing is that it requires photometric skies, so for many observers, you may only be able to use your PEP system once a week or so.

Towards that end, I would be happy to have the AAVSO be a "lending library." If you have PEP systems that you no longer use, you can donate them to the AAVSO, get a tax break, and give us the opportunity to lend them to people who can make use of them. The requirement for such donations is that the systems must be in good condition and must be commercial units with all necessary documentation. Contact me privately if you either have such systems, or would like to get one of the donated systems to use with your telescope.

<http://www.aavso.org>

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