

# The High Desert Observer

The Bulletin of the Astronomical Society of Las Cruces

October, 2007

## President's Message

October brings with it the cooling of autumn and sets the stage for the final acts of the year. We will have many things happening in this final quarter. While it is not an official ASLC event, the Wirefly X-Prize Expo will be held at Holloman AFB on October 26, 27, and 28, the same weekend as our meeting. This should be a great event with the X-Prize events and exhibits as well as the annual Holloman Air Show.

The next weekend is the Renaissance Faire. Nils Allen is managing our booth this year, and he can sure use your help. While the event is only two days, we will need people on three days, starting with Friday, November 2, when the booth will be erected on the Faire site. Nils can sure use your help

in setting it up. Then on Saturday, we will need folks in costume to man (woman? person?) the booth. This is perhaps the most fun part, since you get to dress-up in costume and talk to people about the skies and the ASLC. Sunday is a repeat, but at the end of the day we will need people to help tear down the booth. Please try to make some time in your busy weekend to give us a hand.



Our November meeting will be our official business meeting, including the election of next year's officers. We have a real race on our hands for the board-member-at-large positions, with three nominees and only two positions. Our thanks go out to Vince for getting us a slate of great candidates! If you are not attending this meeting, you will need to get your ballot from the November HDO mailed in so we receive it at the post office box by meeting day, November 23, the day after Thanksgiving.

The Annual Holiday Party will be held in December. We are still working on details, and if you want to make any suggestions as to location, etc., please contact me no later than the October meeting. Finally, we will also make a bulk order of RASC Observers Handbooks and of their Calendar. We will need to know if you want one no later than the October meeting as well. We hope to have them available at the November meeting.

Last weekend one of our senior members, Cecil Post, celebrated his ninetieth birthday. His family threw a great party. Unfortunately, it conflicted with the White Sands Star Party, where many of our members were trying to get the sand out of their equipment, so we were greatly under represented. In any case, the society wishes Cecil a happy ninetieth birthday, and we look forward to being at his hundredth birthday party in ten years. See you at the meeting! Clear and dark skies! - Bert

## Next Meeting

The next meeting will be held on October 26 (fourth Friday of the month), 2007, at the usual place and time (DABCC, room 77, 7:30pm). Fred Pilcher will present a program on the construction of his new observatory and some of the methods he uses to determine asteroid light curves.

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Next Meeting, continued from page 1

The Astro Tidbits Group (contact: Nils Allen) will meet prior to the October meeting at 7pm. Nils will lead a discussion of "A Great Mystery: Where is the Rest of the Universe?" Despite all the on-going hype from astrophysicists about being close to a real understanding of how the Universe works, there is still a lot more to be learned. We will overview what is known and what is not known about unusual mass and energy in the ever-changing world of cosmology. The Imagers Group (contact: Rich Richins) will meet prior to the November meeting. Anyone is welcome to attend these special interest groups meetings.

Other events planned for October include:

Dark Sky Observing at the Upham dark sky site, Saturday, October 13, dusk

ASLC MoonGaze, International Delights Cafe, Saturday, October 20, dusk

Wirefly X-Prize Cup'07, October 26-28 (see President's Message, page 1)

Renaissance Arts Faire, November 3-4 (see President's Message, page 1)

Please see the ASLC website for further information (<http://www.aslc-nm.org>)

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## Reports from the 2007 White Sands Star Party

From Nils Allen.... Well, the weather was overall decent at the party, though thunderstorms were sighted each night not very far away from our site - they rolled on by without effecting our activity much. The major weather issue (as everyone pretty much expected) was the wind as the front passed through, especially Saturday night from late afternoon until around 11:30pm. One issue related to that was that the seeing was poor, though transparency was pretty good. But overall those in attendance (Dave, Jerry, Rich, Bill, Nils, and Frank) seemed to feel the star party was a success - lots of clear dark sky, nice scopes and imaging, sharing and quite a few visitors Saturday night. Our group seemed to be the most dedicated, staying up until 2am or later while most other folks sacked out hours before.



*WSSP Photo from Dave Dockery*

We sure missed those members who passed on this unique opportunity (Bob, Steve, Chuck, etc, etc.) - it was fun, reasonably comfortable, and worthwhile. We even debated some about ways to make ya'll feel bad for choosing not to come... ;~). Consider this tidbit from our viewing with the 20" — not only were the lacy details of the Veil as impressive as I've every seen them, but all the 'Fleas' galaxies near NGC 7331 were fun to pick out in one FOV. My Argo-Navis said one was 15th magnitude - that's the dimmest galaxy I think I have every seen!. Stephan's Quintet was really nice too....oh, well - I guess ya had to be there

From Dave Dockery.... We had a number of members that volunteered to support the Star Party through gate-duty, presenting a workshop, introducing speakers, and helping with the food and door prizes. Our efforts were very much appreciated by Chris Jones, President of AAC and WSSP coordinator.

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WSSP, continued from page 2



*WSSP Photo from Dave Dockery*

This year the workshops were held at the Park headquarters and seemed to be better attended than when people had to drive all the way to the Space Museum in Alamogordo. There were free tickets to the IMAX and Space History Museum included in the registration and I saw a number of star party participants up there as well. Of course we had to wake Nils up after the IMAX movie.

ASLC members set up in a common area and Nils and Bill made lot's of new friends with the 20" Dob. It was by far the biggest scope on the field and views were spectacular so they were like a couple of rock stars and had more groupies than Aerosmith. The reoccurring theme for the weekend seemed to be power problems. First Nils had to rig up a

power cable to get goto running on the 20". Then my imaging session was cut short due to a bad battery, which I had to replace on Saturday. Jerry depleted his telescope and RV batteries the first night and couldn't get his generator started to recharge them the next day so he had to go purely visual Saturday night. Even Rich ("The Eagle Scout") Richins was running low on juice Saturday night, though he had recharged with his ACME Super Solar Panel Battery Charger during the afternoon. More panels, Sc otty???

As always, the public viewing session was fun and we had lot's of interested people looking through the scopes and binoculars. The only issue was the wind, which was strong enough at times to blow my dob off target if I didn't keep a finger on it. Thankfully the wind subsided by midnight and we enjoyed a really beautiful night as everyone got down to the business at hand. Overall, I thought the Star Party went really well and the weather wasn't much of an issue, especially when compared to the drenching we endured at TSP in May. No cloud filters required!

## The Hydrogen Alpha Filter

By Bob Long

As any astrophotographer knows, the more photons you gather the better. So conventional wisdom says that no filter at all is best because all of the light coming from your target of interest reaches the imaging sensor. But is this really true? Anyone who has looked at the Veil Nebula, even under a dark sky like the Upham DSO site, knows that using an OIII filter will give you a much better view. Why is this so? The OIII filter is actually blocking all of the light coming from the object except the two OIII spectral lines at 496nm and 501nm. Not only is it blocking all other light frequencies coming from this object, but it is also only transmitting somewhere between 92% and 99% (depending on filter quality) of the OIII light. So why can you see the Veil better with so much less of it's light reaching your eye? In a word, Contrast! An astute observer will notice that it is not that the veil is getting brighter, but rather it is the background sky that's getting darker. What you have done is raise the signal to noise ratio (SNR). Sky glow is everywhere. It is just a fact of life on a planet that has an atmosphere. While we all are aware that there is a growing light pollution problem, 10,000 years ago there was still sky glow. Even in at the darkest place on the planet the very stars themselves have a part of there light defused through the atmosphere causing a faint nonzero background level for the sky.

Well OK, so what? I can just shoot more frames till I get enough signal, right? No, not always. If your target, like most DSOs, has a bright region and faint extended regions, it may well be that the faint regions

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## Hydrogen Alpha Filter, continued from page 3

are so close to the background sky level that no matter how many frames you shoot, or how long you expose each frame you just can't get a good enough SNR to bring out these faint details. The only way to do so is to raise the SNR. Since we can't increase the target's brightness, we must reduce the background noise.

Noise comes in many forms, some sources of noise we can do something about, some we just have to live with. Thermal noise or dark current, we can improve by cooling the sensor and using dark frame subtraction. Camera or readout noise is the random noise generated by the camera's electronics during image transfer and A/D conversion. This noise is generally very small and can be reduced (if not just ignored) by bias frame reduction. Many optical systems don't produce an evenly illuminated field across the entire sensor (vignetting). In most cases a flat field reduction frame can correct for this. But the real problem and biggest source of noise is sky glow.

This is why we go to dark sky sites. The easiest way to get rid of sky glow is to get away from the city lights. But even here we can't totally escape that nonzero background. So what can we do about that? Welcome to my new best friend, the Hydrogen Alpha Filter.

Much like the OIII filter enhances the view of the Veil Nebula, the Ha filter enhances most emission and planetary nebulas. Just as in the case of the OIII filter, the Ha filter actually reduces the light (signal) coming from the target. However, the SNR is much higher because the biggest source of noise is sky glow. Sky glow is virtually devoid of the Ha wavelength (656.3nm), so it is all but eliminated. This means that while you will have to expose longer to get the same amount of signal, the SNR will be much higher because you have eliminated a great deal of noise. Thus those extended regions, while still dim, can be separated from the remaining background noise.

And don't believe that this only helps with already dark skies. The gross sky glow generated from city lights is also magically wiped away. While incandescent lights produce a wide spectrum of light, the vast majority of the sky glow is produced by mercury vapor, sodium vapor and fluorescent lights. These fixtures are producing light at specific wavelengths. Mercury vapor is at (405nm, 436nm 546nm and 579nm). Sodium vapor is at (583nm and 600nm) and fluorescent lights can be made for a wide range of frequencies; however, how many red fluorescent lights have you seen lately? If the light isn't a deep red then your Ha filter will not pass it. And not just any red, but only the red at 656.3nm.

But the benefits received from the Ha filter don't end there. Most emission nebulas are predominately red. The reason for this is because they are mostly fluorescing hydrogen gas. But there are other spectral lines present as well. SII at 671.9nm and 673nm is common. With a wavelength less than 20nm longer, both Ha and SII are seen to the eye as a deep red. So just using a red filter for RGB imaging will gather light from both of these elements as well as any others fluorescing between about 575nm-700nm (a typical range for a red filter). By capturing just the Ha, you will image structures that are more distinct than those gathered by a broad range of wavelengths. Many times an image will show finer detail by using just the Ha as a luminance channel.

Another benefit of imaging in Ha is that while most imaging is an exercise in futility during a full or gibbous moon, imaging through a Ha filter makes this possible. On the next page is an image of M8, M20 and IC1275. This was taken during the night of the full Moon on September 26, 2007, and through poor transparency, so that the whole sky seemed to glow. This image is two twenty-minute exposures at f/2.8! Notice how not only the brightly the nebulas show, but the dim nebulosity throughout the region could be brought out as well. And this image was taken during the full Moon!

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## Hydrogen Alpha Filter, continued from page 4



*M8, M20 and IC1275 taken on a night with a full moon using an Ha filter*

A final benefit to imaging in Ha is that since you are gathering only the Ha light, star bloat is greatly reduced. Point sources like stars during long exposures tend to saturate. Since you are only capturing a single wavelength of light their luminosity is greatly reduced so it takes much longer to saturate. This is a real boon to those of us who have non anti-blooming gate cameras. Since the Ha components of your target are being captured at almost 100% but the stars are being recorded at a greatly reduced luminosity you can image your target much deeper before blooming begins.

Ok, so these filters are wonderful, what's the catch? No catch really other than the fact that a good Ha filter can be expensive. There are, however, some

limitations to their use. While they work great for emission and planetary nebulas, they are all but useless for reflection nebulas. Since these nebulas only reflect light, just a very small amount of that light is in the Ha wavelength. If you look at the image above you will see that M20 clearly shows the emission portion of the nebula (red in a color image), but the blue reflection portion of the nebula to the north is missing. Also as mentioned earlier that stars are noticeably dimmed by imaging at just one wavelength of light. It stands to reason therefore that open and globular clusters are not good candidates for Ha imaging. For the same reason galaxies are poor Ha targets as well. The exception to this is the local bright galaxies like M31, M33, M81 and M82 and others that are close enough that the large galactic molecular clouds are easily visible. For these galaxies taking frames of Ha and adding them to the red channel will enhance the giant nebulas in these galaxies.

Ok, I'm convinced. I don't plan on giving up my RGB images, but I think I would like to give this Ha stuff a try as well. What filter should I get? I use a 13nm Astronomics Ha filter. Why did I choose it? Actually I didn't, it was part of the package when I bought my used SBIG ST8 camera, but I have been quite happy with it. But here are some things to take into consideration when choosing a Ha filter. Bandwidth... as I stated my Ha filter is 13nm. That means that if the filter's bandwidth is centered on the 656.3nm, the wavelength of the Hydrogen Alpha emission line, then the filter will pass light from 649.8nm to 662.8nm. Popular bandwidths for Ha filters range from 13nm down to 3nm. The tighter the bandwidth the higher contrast you get in your images. As with most things there is a trade off, the higher contrast comes at the price of longer exposure time to get the same amount of signal.

Another little known issue to consider is the fact that the bandwidth of a filter will shift in response to the angle the light hits the filter. For optical systems with a  $f$ /ratio slower than  $f/4$  (i.e., larger  $f$  numbers) this is not an issue, but if you plan to use your filter with very fast systems like a fast camera lens ( $f/1.8$  or  $f/1.4$ ) then you should use a filter with a wider bandwidth. A 9nm-13nm will likely be a better choice than a 3nm-4.5nm. If you plan to use a very fast optical system but want to use a very narrow bandwidth for the highest contrast, there are filters built with their bandwidth centered at a slightly longer wavelength than that of Ha to allow for the shift. A great resource for information on this subject is located on the following website:

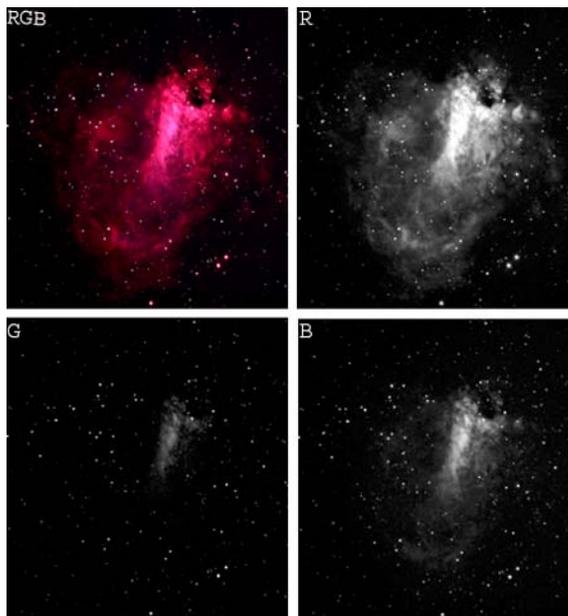
<http://www.astrosurf.com/buil/filters/curves.htm#Protocol>

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## Hydrogen Alpha Filter, continued from page 5

Well that all sounds well and good for you monochrome camera imagers, but what about us one shot color imagers? Don't we just get one pixel in four exposed using a Ha filter? Well yes, but that's not as bad as it sounds. Consider this, your target is an emission nebula right? That means it is most likely a big Ha emitter anyway. If the target is mostly red (like almost all emission nebulas) then the majority of the light is likely in Ha. The blue and green components are likely less than 35% of the signal. So 65% of the total signal was on that one pixel in four anyway. To get a good idea of how much signal you will get with just that one pixel in four, I invite you to open any of your emission nebula images in PhotoShop. In the channels tab turn off the blue and green channels and see just how much of the image is coming from that one pixel in four. Here is a single five-minute image of M17 taken with a modified Rebel 300D.

Notice just how much of your image was from that red channel. Each object will vary according to the amount of different elements that are present. Planetary nebulas will have much stronger green and blue channels than emission nebulas. This is due to the fact that when a star goes nova the heavier elements that the star created oxygen, helium, sodium and many others are all fluorescing at different wavelengths. That does not make them poor choices for Ha imaging, but rather makes them targets for other narrowband filters as well. In fact most other narrowband filters such as OIII, SII, Hb and C2 share the same benefits and uses as the Ha filter. Ha is just the most useful because the majority of the known universe is made of Hydrogen.



In conclusion, there are several benefits of using a Hydrogen Alpha filter for imaging: improving the SNR on many targets; achieving finer details in emission and planetary nebulas; better stellar profiles due to reduced star bloating; a vast reduction in blooming artifacts in NABG cameras; and the ability to image from light polluted skies even with the pesky full moon is a real plus. Hydrogen Alpha filters, what is there not to love?

## Mars Viewing Tips for 2007

From the NASA website (<http://solarsystem.nasa.gov/scitech/astronomy.cfm>)

Mars is the only planet with a surface that can be easily seen through amateur telescopes. Despite its small size, which is about half the size of Earth, Mars has higher mountains, larger rift valleys, and larger impact basins than Earth. Most of these intriguing geologic features are covered with dust, which obscures the view from amateur telescopes. What we mostly see through telescopes is darker cratered terrain in the south and lighter smooth plains in the north.

What will Mars look like in your telescope? Factors such as the quality and cleanliness of the telescope, as well as the magnification and strength of the eye piece all affect the clarity and contrast of the planet's geologic features. Weather and atmospheric conditions, both on Earth and Mars will have an impact as well. If you are observing Mars at low power through a small 60mm - 100mm aperture telescope, Mars will look like a small orange disk or sphere, some markings will be visible. Larger telescopes will reveal not only details on the planet, but also some haze on the limbs or edges of the sphere. During closest approach in

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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 A.S.L.C. 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. S&T subscribers MUST subscribe and renew through the Society Treasurer for the special club rate. To avoid a lapse in delivery, this must be done when S&T sends their reminder, 4 months in advance.

ASLC OFFICERS, 2007  
<[Board@aslc-nm.org](mailto:Board@aslc-nm.org)>

President: Bert Stevens  
[President@aslc-nm.org](mailto:President@aslc-nm.org) / 382-9131

Vice President: Bill Stein  
[VP@aslc-nm.org](mailto:VP@aslc-nm.org)

Treasurer: Janet Stevens  
[jastevens@zianet.com](mailto:jastevens@zianet.com) / 382-9131

Secretary: John McCullough  
[Secretary@aslc-nm.org](mailto:Secretary@aslc-nm.org)

Immediate Past President:  
Vince Dovydaitis  
[PPresident@aslc-nm.org](mailto:PPresident@aslc-nm.org)

Directors:  
Chuck Sterling, Alfred Hughey  
Education Director: Nils Allen

ASLC Newsletter Editor:  
George Hatfield  
[gmhlcnm@msn.com](mailto:gmhlcnm@msn.com)

## Minutes, September 2007 Meeting

Call to Order: Bert Stevens, President, Astronomical Society of Las Cruces (ASLC), called the meeting to order at 7:32 pm., 28 September 2007, Rm. 77, Dona Ana Community College.

Secretary's Report: The minutes of the August general meeting were presented as published in the High Desert Observer (HDO), the ASLC newsletter. Chuck Sterling moved that the minutes be accepted as submitted, Jerry Gaber seconded. The minutes were accepted by those present by voice vote. There was not an additional secretary's report.

Treasurer's Report: The treasurer was not present because of illness. There was not a treasurer's report.

### Committee Reports:

Nominating Committee: Vince Dovydaitis, Chairman, Nominating Committee, reported that he has one nominee willing to stand for each office for the 2008 calendar year. He could not obtain sufficient volunteers from the membership to have at least two (2) candidates for each office, with the exception of Director-at-Large, with three candidates for two offices. Nominees were as follows:

President	Nils Allen
Vice-President	Jerry Gaber
Secretary	John McCullough
Treasurer	Janet Stevens
Director-at-Large	Wes Baker
Director-at-Large	Frank Miller
Director-at-Large	Kirby Benson (nominated at the meeting)

Rich Richins moved that officer nominations be closed, seconded by Dave Dixon. The motion carried with no objections.

Observatory Committee: Rich Richins, Chairman, Observatory Committee, and Chuck Sterling reported on the progress made repairing the Meade 16" LX200 telescope obtained from NMSU. Rich announced that the scope was working after Chuck replaced one of the Pittman drive (RA) motors. Pittman was going to charge the Club \$600 for a replacement motor, slightly less per unit if purchased in quantity. Meade estimated \$945 for shipping, any other required repairs, and repairing/replacing the drive. Chuck obtained a serviceable replacement motor from an astronomer in Anchorage, AK, for \$130 including shipping. He has not been able to check the tracking capability yet. Rich moved that the Club reimburse Chuck for the cost of the motor, Jerry Gaber seconded. The motion passed with no objection.

Jerry Gaber announced that plans for the observatory structure at Leasburg

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Dam State Park (LDSP) were progressing and will be presented to the membership at the October general meeting.

A new park manager has been assigned to LDSP and Rich will make contact with him in the immediate future. Rich then gave a brief synopsis of the project for the visitors and members that had missed previous presentations on the project. A currently unresolved question is the type and design of the mount to be used with the telescope. The NMSU Astronomy Department still has the pier they were using for this scope and it is available to the Club. Dave Dixon offered the plans for the pier he built for one of his 16" LX200s as an option.

There were no additional standing committee reports.

Old Business: The following old business was discussed:

1. Coronado (or equivalent) PST: The club purchase of a Meade SolarMax solarscope is progressing. Steve Barkes has submitted the order and is awaiting a response from Meade. Janet Stevens is also working possible discounts for the Club. Bert Stevens will be the point of contact (POC)/liaison between the Club and the Meade 4M Community. The 4M Community logo has been added to the Club's home page.
2. 2007 Renaissance Art Faire: This year's event will be November 3-4 at Young Park. This is a themed event (booth workers must be in appropriate costume) that the Club has participated in for the last 4 or 5 years and is a prime public outreach event for the Club. Nils Allen will coordinate the Club's participation in this year's event and needs volunteers for booth set-up, tear-down and to man the booth on Saturday (10am to 5pm) and Sunday (10am to 4pm) of the Faire. Nils expects to have a drawing(s) for astronomy-related item(s). Vince Dovydaitis and Bill Stein offered their PSTs for use during the Faire as the Club's SolarMax is not expected to be available in time. Booth workers are expected to pay the Faire entry fee, but Nils will have as many as 12 complimentary wristbands for volunteers that commit early. Nils took the names of potential volunteers at the meeting. Additional volunteers are needed and are encouraged to contact Nils to let him know of their willingness to help and when they will be available.
3. Night Sky Network (NASA/JPL): Steve Barkes is the POC. Jerry Gaber asked if the Club's efforts to build an observatory for public education and outreach were pertinent enough to be reported to either the 4M Community or the Night Sky Network, or both. Bert Stevens expressed the opinion that it should be reported to both entities.
4. X-Prize Expo: although the October 5-7 White Sands Star Party (WSSP) 2007 is a primary effort for the Alamogordo Astronomy Club, Bert Stevens believes they will also participate in the X-Prize event October 26-28 at Holloman Air Force Base.

There was no additional old business discussed.

New Business: There was no new business for discussion.

Announcements: The following announcements were made:

1. White Sands Star Party (WSSP) 2007: WSSP 2007 is scheduled for October 5-7. More information and registration forms are available on-line.
2. The 23<sup>rd</sup> Annual New Mexico Symposium and Jansky lecture will be held at the Array Operations Center on the campus of New Mexico Tech in Socorro on October 19. Several Club members will be making oral

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presentations or attending as participants.

3. The Club's New Astronomer/Star Gazing class is being held at the Unitarian Universalist church on Solano. There are fifteen enthusiastic students attending.
4. Vince Dovydaitis displayed the Sky Quality meter he recently purchased. Nils Allen will demonstrate its capabilities at WSSP 2007.
5. Several visitors attended the meeting:

Mike and Carol Sherick, relocated from California to Las Cruces.

Al and Sherry Woods, visiting from North Carolina.

Kathy Main and Peggy, first time visitors.

Oscar Pilhoefer, new El Paso Astronomy Group president.

There were no additional announcements made.

Chuck Sterling offered a motion to adjourn and George Hatfield seconded. The business portion of the meeting was adjourned at 8:05 pm by acclamation of those present.

General Announcements: Bert Stevens announced that he would start making arrangements for the Club's Holiday Party/December meeting. Please forward suggestions or comments regarding previous years' parties to him.

Observations: Bert Stevens reported completing his 11,000 asteroid observation.

Presentation: The program for the September meeting, 50 years after the launch of Sputnik 1, was presented by William L. (Bill) Stein, PhD., Club Vice-President. Bill's topic was: "Applied Astronomy – A Berkeley and IU Astronomer in the DoD World, Part 2". His career in government service involved precise determinations of timing and location in space, particularly for orbiting sensing platforms, which he described in Part 1. In Part 2, he described his involvement with the Global Positioning System (GPS). He gave an overview of the reference frames, timing, and orbital parameters describing the orbit of objects around the earth. Bill described the geodesy principles and perturbation theory that must be accounted for in these calculations. He also presented the current Earth model (neither a perfect sphere nor an oblate ellipsoid) resulting from these measurements. This presentation was recorded for playback via the Internet. It and other meeting presentations can be seen on the web at <http://www.aics-research.com/lectures/aslcnm/>.

The monthly meeting concluded at 8:55pm. Respectfully submitted by John McCullough, Secretary

## ASLC Continues to Bring Astro-Education to our Community

By Nils Allen

Well, here we are again, halfway through another of our Introductory Astronomy courses designed to stimulate and educate Las Cruces. Thanks to the volunteer efforts of Dave Dockery, Steve Barkes, Nils Allen and especially Rich Richins, we have led this group of 15 curious citizens toward understanding more about our night sky and our universe. Rich did most of the work to set up this 7-week course at his church, and its success could lead to future classes at their site. The Community College approach we used before

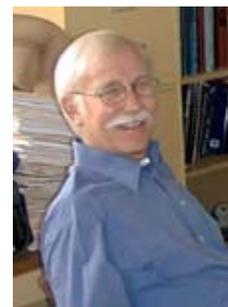
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## Public Astronomy Course, continued from page 9

wasn't attracting enough students and had significant overhead costs. The students range from rank neophytes up to a knowledgeable cosmologist, but all seems to be enjoying the animated talks, Q&A sessions and observing opportunities provided. Our agreed-upon goal was to emphasize hands-on, under the stars observing, which thanks to our good skies lately has worked better than in previous classes. For example our dark-sky session this last Monday (October 8) at Leasburg was well attended. I heard a goodly number of "amazing" and "beautiful" comments, which is always a good sign. We used a range of devices including naked-eye/laser pointers, binoculars, an APO, up to Rich's 16" Dob. Steve and I especially were excited to try out the skies under which our new observatory will be operating - not bad at all! Some of the most impressive topics are still ahead - galaxies, stellar evolution, cosmology and especially astrophotography. Hopefully these students will give us some word-of-mouth advertising so future classes will be just as successful. It's all for the good of our community and the future of our Society!

## Webcast Lecture on Exploding Stars in an Accelerating Universe, October 19

Dr. J. Craig Wheeler, renowned astrophysicist and author, will lead an exploration of ideas at the cutting edge of current astrophysics in a live webcast on October 19. His extraordinary journey to investigate explosions of supernovae, resulting neutron stars, mysterious black holes, and elusive gamma ray bursts are far from science fiction. These exotic objects in our universe make up the life cycle of stars, are the basis for planets and life, and measure the history and fate of our Universe. Dr. Wheeler's lecture follows the formation of supernovae, their characteristic shape and its significance, as well as the resulting celestial objects formed by the collapse of a star. Along the way, Dr. Wheeler examines evidence suggesting that the Universe is actually accelerating. He also explains recent developments in understanding gamma-ray bursts - perhaps the most catastrophic cosmic events of all.

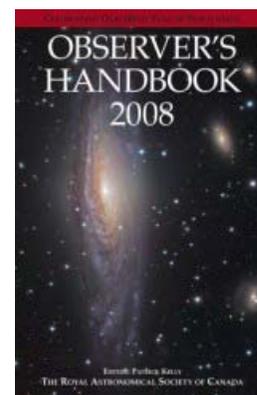


*Craig Wheeler*

The University of Texas would like to invite those interested to view the lecture at 7 pm (Central Time). The webcasts are very high quality, and viewers can submit questions to the speaker through our website and the speaker answers the online questions in real time. The webcasting software UT uses requires viewers to download a small plugin, but it is very simple and quick to install. A link to the details of the lecture and the webcast could be found at: <http://www.esi.utexas.edu/outreach/ols/lectures/Wheeler>.

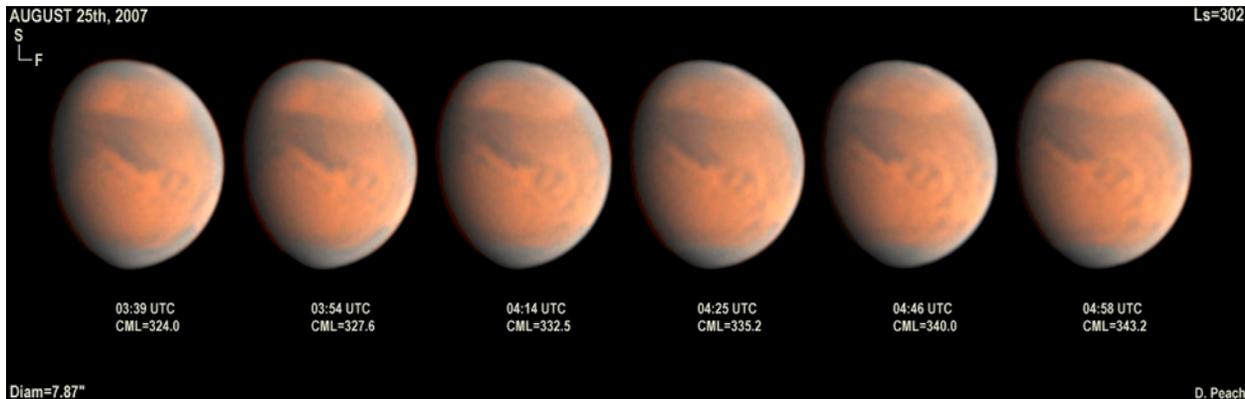
## Observer's Handbook, 2008

The annual Observer's Handbook is a 326-page guide, greatly expanded since first being published in 1907 by the Royal Astronomical Society of Canada. Through its long tradition and the expertise of nearly 50 contributors, the Observer's Handbook has come to be regarded as the standard North American reference for data on the sky. The material in the Handbook is of interest to professional and amateur astronomers, scientists, teachers at all levels, students, science writers, campers, scout and guide leaders, as well as interested general readers. The Observer's Handbook is an integral part of many astronomy courses at the secondary and university levels, and it should be on the reference shelf of every library. The RASC Observer's Handbook will be \$18.00 this year. Please let us Janet Stevens (Treasurer@aslc-nm.org) know as soon as possible if you want one so we can place the order



## Mars Viewing, continued from page 6

2007, the apparent diameter of Mars will be more than 4 arcsecond smaller than it was at the same period in 2005; however, it will be 10 degrees higher in the sky - much better for observing the Red Planet - helping to make up for the smaller size. June 2007 through April 2008 are the prime Mars observing months.



*Recent views of Mars. Photo credit: Damian Peach*

Mars remains a morning planet for most of 2007 until its opposition on December 24. The best time to view Mars will be several hours after it rises, when it is highest in the sky. By December, one can enjoy Mars viewing in the mid-evening hours, but amateur astronomers will wait even later for the best views of the red planet. You can point out the pumpkin-colored planet to trick-or-treaters on Halloween. In November Mars begins its retrograde loop.. It will “appear” to halt its direct motion (eastward relative to the background stars) and begin creeping westward. It rises at about 8pm and transits (reaches its highest point in the sky) at 3am, which is the best time for viewing planets. The southern hemisphere of Mars is slightly inclined towards Earth. But since summer is ending on Mars in December the south polar ice cap will be tiny, if visible at all. Some of the dramatic features such as Syrtis Major, Solis Lacus will be visible through telescopes in November

In December Mars will not be this close to Earth again until 2016: at a distance of 0.60 AU, or 56 million miles from Earth. Mars rises just after twilight in December. This month, Mars reaches its largest angular diameter of nearly 16 arcseconds. For comparison, Saturn, minus, its rings, spans about 18 arcseconds in apparent diameter this month. Compare the two planets. Mars is 0.6 AU from Earth, while Saturn is 9.2 AU (855 million miles) from Earth. Mars outshines the brightest star in the sky - Sirius, in the constellation Canis Major. On December 23, look for Mars near the full moon. North American observers can glimpse the dark feature Syrtis Major this month, while southern observers can view Solis Lacus. Mars is extremely favorable for telescopic observing this month. From now until April 2008, Mars will be great to view all night long.

## November Issue of the HDO

Articles for the November issue should be sent to me by Saturday, November 10. Material should be sent as email (GMHLCNM@msn.com) or as an attached Microsoft Word document. If you have any questions about submitting something to the HDO, please don't hesitate to contact me (532-5648 or via email). Thanks in advance! George Hatfield, Editor, ASLC Newsletter.

## Aurigid Meteor Image featured by *Sky and Telescope*

By Chuck Sterling

Editor's note: One of Chuck's images was recently published by *Sky and Telescope* ([www.skyandtelescope.com/community/gallery/skyevents/9567202.html](http://www.skyandtelescope.com/community/gallery/skyevents/9567202.html)). Below is a description of how the image was taken.

Maria Elena, our daughter Jennifer and her fiancée Josiah, our dog Spring, and I got comfortable in the back yard just after 5am, and started watching the sky. Melissa, another daughter, stayed in bed. It was still pretty dark, and there were lots of clouds moving by; it did not look promising at that point. I started taking shots about 5:10 and stopped at 6:00; I took over 100. I saw several bright meteors, one bright enough to light up a cloud, but the only one I caught was in this image at 5:56, just before dawn. I never saw it at the time; I first saw it in the image. The moon was bright, and the reflection of its light can be seen in the pecan tree branch, and in a circular light region just above and right of center. This was shot with a Canon EOS Digital Rebel XTi on a fixed mount, for 30 seconds, at 18mm, f/5.6, and ISO1600.



*One bright Aurigid meteor just before dawn. Orion, Taurus, Gemini, and Auriga frame the meteor.*

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**ASTRONOMICAL SOCIETY of Las Cruces**  
**PO Box 921**  
**Las Cruces, NM 88004**



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