

# The High Desert Observer

The Bulletin of the Astronomical Society of Las Cruces

October, 2006

## October Meeting... Zurlinden El Paso Observatory

Joe Zurlinden, a past president of the ASLC (1981), will be the speaker for the October 27 meeting. Mr. Zurlinden will describe the design and construction of his observatory and its German equatorial mount. The mount and telescope weighs more than a ton. Joe's idea was to have a system with a certain amount of flexibility to interchange various telescopes and instruments for doing serious research; maybe even the research to complete his PhD in Astrophysics. The presentation will provide many photos illustrating the progress of this project.



The October meeting will be held at the usual place (room 77, Dona Ana Branch Community College) starting at 7:30pm. See the ASLC website for directions.

## Southern New Mexico Star Party, October 17-22



*City of Rocks State Park*

Join astronomers from throughout the Southwest under the pristine dark skies of Southern New Mexico at the Southern New Mexico Star Party. The event takes place over five evenings, October 17-22, at New Mexico's City of Rocks State Park - home to thousands of strange monolithic rock formations found in only six other locations in the world.

At an elevation of over 5200 feet (1600 meters) and located scores of miles from any population centers, the park offers some of the finest dark sky viewing conditions to be found. October is an ideal month to visit City of Rocks with daytime temperatures typically in the 70s and pleasantly cool clear evenings. In addition to pristine skies, there are hiking trails, picnic areas, camping sites, RV hookups, nearby hot springs, and over a thousand acres of monolithic rocks to climb and explore.

This year, participants will have the opportunity to share their love of the night sky with the public during two evening sessions (Wednesday and Saturday from 7 to 9 pm) using their personal scopes and the park's own observatory-housed 14" SCT. And if that's not enough, the second annual X-Prize Cup Exposition is being conducted October 20-21 only 75 miles from our observing field. You can easily take in the Expo during the day and view the stars that evening. So download a registration form today ([http://aslc-nm.org/SNMSP\\_Home.htm](http://aslc-nm.org/SNMSP_Home.htm)) and join us. The event is jointly sponsored by the National Public Observatory, the El Paso Astronomy Club, and the Astronomical Society of Las Cruces.

## As Far As the Eye Can See... Using Double Stars to Gauge Seeing Conditions

Joseph Mancilla

Double stars have a very practical use for both the visual observer and astrophotographer. At low powers of 70x and below the effects of bad seeing are not that noticeable, but at high powers they become very apparent. The closest separation that the human eye (unaided) can distinguish is about 4 arcminutes. Twice that, or 8 arcminutes is more practical and comfortable, but I find that 6 arcminutes will work well. 6 arcminutes is equal to about 1/53 of an inch viewed at 10 inches. Let's take a double star with the separation of the pair being 2 arcseconds. Let's use a magnification of 180x... 2 arcseconds times 180x = 360 arcseconds divided by 60 arcseconds = 6 arcminutes. We now have a 2 arcsecond separation appearing as a 6 arcminute image. By observing the image of the two stars and the separation gap, you can make critical assessments about the seeing conditions. If the seeing is shimmering and boiling, you will see it. If you are using a refractor and the sky is calm, you will see the classic diffraction rings around the stars. If the two stars appear to be having a fistfight, the seeing is pretty turbulent. Worse yet is what I call the "Amoeba effect." That is when the two stars appear as one blob that is struggling with itself and trying to split apart. They may momentarily split, but only to fly back together as a quivering blob. If you are using a pair of stars with a 3 arcsecond separation, 120x will be required to get the same 6 arcminute image.



*Photo:*

*www.telescopes.com*

A 1.5 arcsecond pair will require 240x for the same 6 arcminute image. Keep in mind the magnification used to examine the pair and the magnification that you intend to use when you are actually observing or imaging. Also, if the pair of star are of unequal magnitude (i.e, a difference of 5 magnitudes or greater), you will need more power in order to split them. Here are a few sample stars: Zeta aquarii , magnitude 4.4 and 4.6, separation 1.6 arcseconds; Epsilon Lyrae ( double double ) magnitude. 5.1 and 6.0, separation 2.8 arcseconds and magnitude 5.1 and 5.4, separation 2.2 arcseconds. There are many other stars that can be used as a reference. One just has to spend a little time to find them. Happy Hunting!

## The 35th Annual Renaissance Artsfaire Is Almost Here!

John McCullough

ALSC's application to participate in the 2006 Renaissance Artsfaire has been accepted and plans for our display continue. The Artsfaire is November 4-5 at Young Park and is one of the region's most popular fall events. The Faire will be available to the public 10:00 am - 5:00 pm, Saturday and 10:00 am - 4:00 pm Sunday. Our booth set up for this event is 1:00 - 5:00 pm on Friday, November 3, and take down is after 4:00 pm Sunday. If you can help set up or take down of the ASLC displays or would like to spend a day or part of a day interfacing with the public during this event, contact Rich Richins (505 646-5169, [rrichins@zianet.com](mailto:rrichins@zianet.com)) or John McCullough (505 524-3030, [mcculloj@zianet.com](mailto:mcculloj@zianet.com)) for information and details. Either contact person can also be contacted through the [aslcnm@yahoo.com](mailto:aslcnm@yahoo.com).



Booth workers are asked to be in period costume and ASLC has been awarded "Best Costumed Group in the Children's Realm" in the past.

# Raising the Bar (again)

Rich Richins

At last year’s holiday party, incoming President, Vince Dovydaitus, said that we (the club) had raised the bar during the past year and he hoped we could continue to do so during the coming year. As the final months of 2006 wind down, we find ourselves in a position to do just that. The upcoming X-Prize Expo is expected to be three times as big as last year’s event, and our club’s efforts have grown to keep pace. Instead of a single table in the big tent, we’ll be out in a tent of our own right in the heart of the action with three tables, several telescopes, and numerous other displays.

Already, my living room is looking like a convention floor with a large display (courtesy of the International Dark-Sky Association) and 4 boxes full of handouts from IDA and the Astronomical Society. More are expected during the coming week. Several other members are contributing to our X-Prize effort. Chuck Sterling is building several display boards that we will use to support artwork and displays at the expo. Dave is working on a really nice poster depicting our club’s activities and featuring some of our founding members. Chuck and Richard are providing telescopes. Bert and Janet have provided us with some really cool posters. Nils is on line for several educational displays and details on amateur telescope making. And our own President Vince is working to get us a large screen plasma display to display astro-images, club activities, et cetera. It’s really shaping up to be an outstanding outreach opportunity for the club.

## This Month’s Observer

October Program .....	1
Southern NM Star Party .....	1
As Far As the Eye Can See .....	2
Artsfaire .....	2
Raising the Bar .....	3
November Issue HDO Deadline .....	3
Elmer Reese .....	4
2:3 Resonance .....	4
Election Ballot for 2007 .....	5
September Meeting Minutes .....	6

About all that is needed now are volunteers to work the booth all day. I’ve already received several offers to help with the booth, but we’ll need even more. With all of the activities that we’re supporting at the expo, we’ll need at least 4 people in the booth (or working the scopes) throughout the day. Sign-up lists have been circulating on the internet; if you don’t subscribe to the ASLC-NM listserver, just call me and we’ll find a day and time that works for you. Setup will be Tuesday and Wednesday (October 17-18). We can bring in telescopes on Thursday. Items like laptops can be brought in the day of the event.

It would be easier if not for the fact that our club is also involved in a star party at City of Rocks S.P. the very same weekend. A few months ago, we agreed to cosponsor the Southern NM Star Party. That venue, like the X-Prize Expo will require some of our time and talent. Volunteers are needed on Saturday night to assist with the public star party. All astronomer/campers are encouraged to bring a telescope down to the group camping area and share a view and some information with the public.

And let us not forget that two weeks after these events, we’ll be doing it again at the Renaissance Faire. So fellow clubbies, we have a unique opportunity in the coming weeks to do what our motto says. Enjoy sharing the sky with our (world) community while we continue to put our club on the map.

## November Issue HDO

Articles for the November issue should be to me by Sunday, November 5. This is a few days early since I will be out of town starting November 9. 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

## Remembering Elmer Reese

Walter H. Haas

Few present members of the ASLC knew Elmer Reese; but people who did, all over the world, must be saddened by the news of his recent death. Beginning in about 1940 and continuing for more than 20 years, he recorded and reported excellent observations of Jupiter, other bright planets, and the Moon with a 6-inch reflector made completely by himself. He was a charter member of the Association of Lunar and Planetary Observers in 1947 and was elected to membership in the British Astronomical Association. In 1963 he began employment with the NMSU Observatory, continuing until 1977, and analyzed measures of their extensive planetary photographs, as previously with his old amateur visual observations and drawings. He published many refereed papers in professional journals, some theoretical research upon the active atmospheric phenomena on Jupiter. Few persons have been so widely respected and admired by both amateur and professional astronomers everywhere. Many of his observations and some of his correspondence are preserved in the Rio Grande Historical Collections at the NMSU Library.

## The 2:3 Pluto-Neptune Resonance

Fred Pilcher

In last month's *High Desert Observer* I stated that Pluto is in a 2:3 gravitational resonance lock with Neptune which causes Neptune always to pass between Pluto and the Sun when Pluto is near aphelion, nearly two billion miles beyond Neptune, and this is the closest that the two objects can approach. Here I explain this process.

The last time Neptune passed between Pluto and the Sun occurred when Pluto was at aphelion. Because Pluto makes two revolutions around the Sun in the same time as Neptune makes three, Pluto, Neptune, and the Sun will next align also with Pluto at aphelion. But this is not an exact condition, only approximate. Suppose that due to some disturbance, such as a gravitational perturbation by Jupiter, Saturn, or Uranus, Pluto had already passed aphelion and was starting inward when Neptune overtook the slower-moving Pluto. In this case Pluto would be closer to Neptune after the alignment than before. The forward pull by Neptune after alignment would exceed the backward pull before alignment. This would increase Pluto's forward speed in its orbit. The increased speed would make Pluto go farther out from the Sun instead of going around the Sun more quickly. While it may seem counterintuitive, the speedup increases instead of decreases the period of revolution. The same effect occurs when a lunar-bound spacecraft is first placed in a low parking orbit around Earth, then given a forward push to cause it to go farther out toward the Moon.

In Pluto's case, the increased period of revolution would cause it to make less than two full revolutions before Neptune gained a lap, and the succeeding alignment would be less far ahead of aphelion than previously. Alignment has been driven back toward aphelion.

Suppose that Pluto had not yet reached aphelion when Neptune passed between it and the Sun. In this case Neptune's backward pull preceding alignment would exceed its forward pull afterward. This would reduce Pluto's orbital speed, causing it to move less far out on its next revolution, reduce its revolution period, and at the next alignment be closer to aphelion. Any perturbation which changed Pluto's revolution period from exactly 1.5 times that of Neptune is corrected. Like a pendulum slightly disturbed from hanging straight down, Pluto's orbital period oscillates around 1.5 times Neptune's rather than remains at exactly that value. For other Trans-Neptunian objects in the 2:3 resonance lock the same conditions hold. Elsewhere in the

solar system, and even from some extra-solar planetary systems with two or more detected planets, resonance locks in several numerical ratios, 1:1 for the Trojan asteroids, 3:2, 4:3, 2:1, etc., occur and have long term stability by this same mechanism.

Pluto is well known for having a much larger orbital inclination to the ecliptic, 17 degrees, than any of the eight planets preceding Pluto in discovery. For Pluto the line of nodes connecting the places where its orbit crosses the plane of the ecliptic is nearly perpendicular to the line of apsides connecting the perihelion and aphelion points. This further increases the minimum distance between Pluto and Neptune, as Pluto is more than 14 astronomical units south of the ecliptic at aphelion where its closest encounters with Neptune occur. Again the gravity of Neptune causes Pluto's line of apsides to oscillate back and forth between a perpendicularity to its line of nodes.

Computer simulations have to date been extended over several hundred million years and show that these conditions persist for the entire interval of the simulations. These simulations have found still other periodicities in Pluto's orbit caused by the 2:3 resonance lock with Neptune.

See the Pluto/Neptune diagram on page 8.

## Election Ballot for 2007 Officers

Please bring your completed ballot to the October meeting or mail it to the address shown before October 27, 2006: Ballot, Secretary ASLC, PO Box 921, Las Cruces, NM 88004

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### Official Ballot - Astronomical Society of Las Cruces, New Mexico

Election of Officers for the year 2007

<u>Nominated Candidate</u>		<u>Write-in Candidate</u>	
President	<input type="checkbox"/> Bert Stevens	<input type="checkbox"/>	_____
Vice President	<input type="checkbox"/> Bill Stein	<input type="checkbox"/>	_____
Secretary	<input type="checkbox"/> John McCullough	<input type="checkbox"/>	_____
Treasurer	<input type="checkbox"/> Janet Stevens	<input type="checkbox"/>	_____
Elected Director	<input type="checkbox"/> Alfred Hughey	<input type="checkbox"/>	_____
Elected Director	<input type="checkbox"/> Chuck Sterling	<input type="checkbox"/>	_____

Signature and printed name of voting member:

\_\_\_\_\_

Sorry, unverified ballots cannot be counted; be sure to include your name.

## 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, 2006

[<Board@aslc-nm.org>](mailto:Board@aslc-nm.org)

President: Vince Dovydaityis  
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Treasurer: Janet Stevens  
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Secretary: Bill Stein  
[susanandbill@fastwave.biz](mailto:susanandbill@fastwave.biz)

Immediate Past President:  
Rich Richins  
[rrichins@zianet.com](mailto:rrichins@zianet.com)

Directors:  
Steve Barkes, Dick Olson

Education Director: Nils Allen

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

Emeritus (life) Member: Walter Haas

## Minutes, September 2006 ASLC Meeting

President Vince Dovidaitis called the meeting to order at 7:35 pm. The President then mentioned the Jansky Lecture being held at the NRO in Socorro. This is an opportunity to hear a first-rate talk and enjoy a dinner with other astronomers. Vince will be traveling up the night before and staying overnight and will accept non-smoking riders.

Rich Richins reported on the planning for the X-Prize Expo. We have a 10' x 10' tent near the middle of the display area. The tent is open on the east, north and west, with the south side closed. Rich has requested materials from the A.L., a large poster from IDA, and a large display from them as well along with lots of brochures. *Astronomy Magazine* is also sending some material. *Sky and Telescope* has not responded yet. Vince has asked Best Buy if they could loan us two large plasma displays for the X-Prize Expo. Vince also asked that Best Buy also provide an employee to watch over the displays. All they ask is that we post a small sign indicating who loaned them to us and the pricing. They would also provide a supply of the manager's business cards to hand out. Vince thinks we should put together a group of our great astrophotos. We could also use a webcam to project a hydrogen-alpha solar image, but it might not cover the whole solar disc. Other ideas include telescope making, astrophotography, and poster printing.

Rich Richins, the Nominating Committee Chair announced the officer nominations for the 2007 calendar year:

Bert Stevens - President

Bill Stein - Vice President

Janet Stevens - Treasurer

John McCullough - Secretary

Chuck Sterling - Director

Alfred Hughey - Director

Vince Dovidaitis - Immediate Past President

The Chair then opened the floor for nominations. There were no nominations from the floor. The ballot will appear in the *High Desert Observer*.

The President announced the WSSP was canceled, but the Enchanted Skies Star Party would allow WSSP registrants to attend without paying the late fee.

There was a question about the *Observer's Handbook*. The Treasurer was unavailable to report a status on ordering these books. Sixteen people

*September minutes, continued from page 6*

indicated that they wanted to purchase them. Vince suggested that we purchase one for the Branigan Library and the University Library.

Our booth in the Children's Realm at the Renaissance Faire also needs volunteers. Contact John McCullough if you can help out.

The Southern New Mexico Star Party is also being supported by ASLC at the City of Rocks. Rich asked that everyone who is going get their registration in as quickly as possible so they can reserve as much of the campground as possible.

Dave Dockery brought up the Astronomical Calendar by Guy Ottwell. He is thinking of group purchase. If you are interested, please contact him directly.

Joseph Mancilla said that Dr. Chandover will speak at the October meeting. He suggested that she be made an honorary member because she has given us so many talks. President Dovidaitis said this should be brought up at a Board Meeting.

The business portion of the meeting ended at 8:06 pm.

Dave Dockey then gave a talk on "CCD Astrophotography on a Budget". His primary imager is the Meade DSI Camera, a low cost imager using a Sony sensor and 16-bit electronics. These are uncooled, but still have very low noise. They come in both monochrome and one-shot color.

The new Pro II models have larger sensors and lower noise. They also have a built-in temperature sensor and anti-blooming. These are light-weight and run directly off the USB bus power. One problem is that the slot for the slide filter bar exposes the cover glass for the sensor to dust, so flats are mandatory. There were also some minor issues with the bundled image processing software.

There are some upgrades available, including filter wheels, coolers, and a replacement faceplate. There are also H-alpha, SII and OII narrowband filters available. These should only be used with the monochrome version, since the color versions have red, green, or blue filter masks over the different pixels.

The Autostar Suite software includes a planetarium program that interfaces to the Autostar controller for the Meade telescope. Envisage image acquisition software controls the DSI camera and will do some of the image processing. It has some automated processing features that can make image processing easier. It can also do autoguiding, even with a second camera.

The main image processing software is called ASIP. The software has many standard tools, including group operations, calibration, registration, and stacking. It also has tools to do photometry.

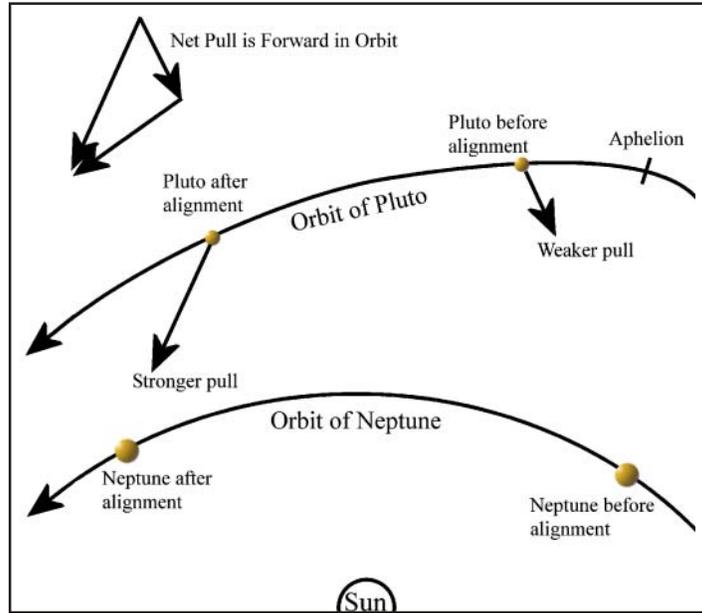
Dave then discussed some of the fundamentals of CCD imaging. These included flats, biases darks, filters, hot pixels, and more. Many people expose for up to 10 minutes with the Pro II, but the images can be stacked to increase the effective exposure time.

Dave showed some of the images he has taken with it, including the Lagoon, M81, M27, the Orion Nebula in H-Alpha. Dave then showed some color images taken by Mark Sibole in Fife Lake, MI.

There are many web resources, including a Yahoo group, various web pages, and a number of books on CCD astronomy. Dave fielded a series of questions from the audience.

The meeting adjourned at 9:10 pm. Respectfully submitted by Berton Stevens, Acting Secretary.

2:3 Resonance, continued from page 5



For alignment of Pluto, Neptune, and the Sun after Pluto aphelion, the forward pull by Neptune after alignment is stronger than the backward pull before alignment because Pluto is then closer to Neptune and the Sun. Add together the magnitude and direction of these forces and the vector sum is forward as well as inward and thus Pluto's orbital speed increases. Obviously, this drawing is not to scale and the difference between these two pulls is exaggerated in this diagram.

## Order Observers Handbook and Calendars

Janet Stevens

I have the prices for ordering the Observers Handbook and calendars. The price you will pay depends upon how many are ordered by ASLC membership. I will start taking orders and let you know the price at the next meeting.

The price schedule for the RASC Observers Handbook is as follows. I think that we ordered 22 copies last year.

	Unit Price	S&H	Total
1-4	\$25.95	\$6.00	\$31.95
5-9	\$15.95	\$3.00	\$18.95
10-24	\$15.45	\$2.00	\$17.45
25-99	\$14.95	\$1.00	\$15.95

I will also accept orders for the RASC calendar this year. The price schedule for the calendar is:

1-4	\$13.95	\$6.00	\$19.95
5-9	\$ 8.95	\$4.00	\$12.95
10-24	\$ 7.45	\$2.00	\$ 9.45
25-99	\$ 6.95	\$1.50	\$ 7.45

You can check out both on the RASC website. The URL is [www.store.rasc.ca](http://www.store.rasc.ca). Please let me know if you are interested (jastevens@zianet.com).

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



ASLC - Sharing the Universe  
With Our Community  
for Over 50 Years