

Next Meeting

The next meeting will be held on January 26 (fourth Friday of the month), 2007 at the usual place and time (DABCC, room 77, 7:30pm). There will be no December meeting at DABCC since the annual Christmas Party was held on December 9. Other events planned for December include:

Dark Sky Observing at the Upham dark sky site, Saturday, December 16, dusk

ASLC MoonGaze, International Delights Cafe, Saturday, December 30, dusk

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

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The Evolution of Jupiter's White (Red) Oval(s)

Dr. Nancy Chanover, Astronomy Department, New Mexico State University

Jupiter has long been known for its colorful storms and dynamic cloud features in its atmosphere. The most famous storm on Jupiter, the Great Red Spot (GRS), has been in existence for hundreds of years. Several smaller storms, known as the White Ovals, formed in late 1939 when Jupiter's South Temperate Belt completely clouded over and then gradually cleared. As it cleared, three vortices "spun up" and became known as FA, BC, and DE. By the 1970s, their size had stabilized and they spanned roughly 10 degrees of longitude.

The Voyager 1 and 2 spacecraft, which flew by Jupiter in 1979, provided unprecedented detail in the images it returned of the GRS and the White Ovals. By tracking individual cloud features in and around these storms, it became clear that the GRS and the White Ovals are anticyclonic in nature, meaning they rotate in the counter-clockwise direction and they are regions of high pressure. Although these vortices migrate around the planet, they are confined in latitude by strong east-west winds that inhibit most motion in the north-south direction.

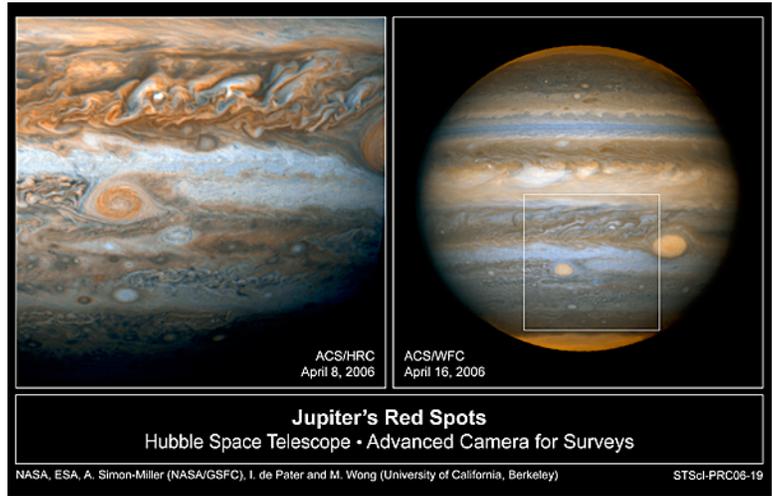
In the late 1990s, the ovals began to move closer to one another. The cyclonic, or clockwise-rotating, storms that were located between the White Ovals began to weaken, perhaps due to numerous passages below the GRS over the years. Then, in 1998, the White Ovals BC and DE merged together, resulting in the oval dubbed BE. This merger occurred when Jupiter was behind the Sun as seen from Earth so it was not observed in real time, only after the fact. The Galileo spacecraft, which was in orbit around Jupiter at the time, did capture before-and-after images of Jupiter's ovals. A second merger, where BE and FA combined to make BA, occurred in 2000. Before-and-after images of the second merger were acquired with both

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Jupiter, continued from page 1

Hubble Space Telescope and the Cassini spacecraft, which flew by Jupiter en route to Saturn in December 2000. The single White Oval, BA, has remained in the South Temperate Belt since 2000.

In late 2005 and early 2006, the amateur astronomy community reported the detection of a color change of BA. It went from white to as red as the Great Red Spot! This motivated two teams of planetary scientists to request Director's Discretionary Time on the Hubble Space Telescope to study this phenomenon in more detail. The first team was headed by Dr. Amy Simon-Miller of NASA/Goddard Space Flight Center; Dr. Simon-Miller earned her Ph.D. from NMSU in 1999, and this was the team that I was a member of. The second team was headed by Dr. Imke de Pater at U.C. Berkeley. Both teams were granted a little bit of telescope time, so Hubble images of the newly colored oval (also known as Red Junior, the Little Red Spot, among other names) were acquired on several dates in April 2006. [In anticipation of these observations, Dr. Simon-Miller's team searched the Hubble archives and found some Jupiter observations that were taken in January 2005 as part of a study of Jupiter's large moon Ganymede. Even in the January 2005 images, the outer ring of BA appeared as a reddish color, while the center of the oval remained white.]



Analysis of the new Hubble images, as well as new ground-based observations, yielded several interesting results. In terms of the color change, the Simon-Miller team used a technique known as Principal Component Analysis to identify different "factors" that cause color variations in an image. They found three: an overall brightness (greyscale) variation among Jupiter's clouds, a blue-absorbing (i.e. red-reflecting) material seen in Jupiter's dark belts, and a separate coloring agent found only in the centers of the GRS and BA. The identity of this coloring agent remains unknown, but it is likely related to some compound that is dredged up from Jupiter's deeper atmosphere and that turns red when exposed to the ultraviolet light of the Sun. Several different forms of sulfur or phosphorus have been proposed, but have not yet been confirmed as the source of Jupiter's red clouds.

Why did BA change its color now? Perhaps the mergers of the White Ovals resulted in a vortex that reaches deeper down into Jupiter's atmosphere, providing new access to this mystery coloring agent. Or perhaps now the merged storm, BA, is vertically more extended than the previous White Ovals. This would enable material to be held aloft in the high atmosphere for a longer time, thereby allowing for more UV-induced photochemistry to take place. We are also acquiring ground-based spectroscopic observations of Jupiter from the Apache Point Observatory 3.5 meter telescope that may provide us with clues. These spectra may elucidate unique chemical signatures of this mystery coloring agent that will enable its identification.

We have been able to identify unique cloud features in BA and track them over time to determine wind speeds in and around the oval, albeit with larger errors than spacecraft observations with Voyager, Galileo, and Cassini. The winds in BA appear to have increased slightly since the mergers took place. This is not entirely unexpected since the oval's size has also changed - it has become less extended in the longitudinal direction. Like the ice skater who spins faster when she draws her arms closer to her body, the slight shrinking of BA post-merger may have caused the vortex to spin more rapidly.

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The vertical structure of BA has also been studied using both the HST images and ground-based adaptive optics observations from the Keck 10-meter telescope. Using a variety of filters that probe a range of altitudes in Jupiter's atmosphere, we find that BA is higher than the surrounding clouds. It may not be quite as high as the GRS, but thermal images show almost no heat escaping through the clouds in BA, suggesting that the clouds are approximately as thick as those in the GRS.

In summary, Jupiter's ovals have undergone dramatic changes over the past decade. The recent color change of the single remaining White Oval, BA, is likely related to the fact that it is a product of recent oval mergers. There appears to be a coloring agent unique to the Great Red Spot and the newly red colored BA, but the exact identity of this coloring agent remains unknown. Wind speeds in BA have increased over the past 2.5 decades since the Voyager flybys, and the clouds in BA seem to be higher than their surroundings. We plan to re-examine the previous spacecraft observations of BA and the other White Ovals to study the wind speed evolution in more detail. In addition, the New Horizons spacecraft will fly by Jupiter on February 28, 2007, and will take very high resolution images of Jupiter's atmosphere. Unfortunately these observations will be taken through a clear filter, so we will also rely on supporting ground-based observations during this time period to learn more about BA's color change and continued evolution.

Resources: All Jupiter press releases from the Space Telescope Science Institute: http://hubblesite.org/gallery/album/solar_system_collection/jupiter_/; Keck press release of BA observations: <http://www.keckobservatory.org/article.php?id=88>; International Outer Planets Watch (lots of great amateur images!): <http://www.pvol.ehu.es/index.jsp?action=iopw>

"Imaging Corner" to be Added to Monthly ASLC Meetings

By Rich Richins

Beginning in January (2007), the growing number of imagers will conduct an "imaging corner" discussion prior to ASLC monthly meetings. The idea for such a workshop was discussed briefly last year, but at the time, there were only 3 or 4 active imagers in the club. The number of imagers has grown significantly since then to something like 8 or 10. In addition, the method of image acquisition has really diversified since a year ago. A year ago Canon DSLRs were the main method for image acquisition. We now have several members with a variety of dedicated astronomical CCDs. Hence, the methods for producing images from data has changed significantly.



NGC 891 by Robert Long

Steve Barkes will lead the January session which will focus at least in part on organizing the clinics for the coming months. Dave Dockery has already agreed to do an upcoming session on the Jerry Lodriguss' method for combining Ha luminescence into red channels. If you want to share your imaging knowledge with the group, please show up to the inaugural meeting and get on the presenters list.

The Imaging Corner will likely take place every other month at 7:00pm, immediately preceding the regular ASLC monthly meeting. If there is sufficient demand/speakers, we may hold sessions every month. We'll undoubtedly be discussing this at the January organizational meeting. The ASLC imaging core has come a long way since hypered Tech Pan. Come and be a part of this growing group.

What are YOU thankful for?

By Nils Allen

Tis the season, you know - take a moment or two to consider your astro-thankfulness quotient...I did. I am definitely thankful for:

- 1) Neat coincidences - that currently we have a decent North Star, i.e., Polaris -- most of the time that's not so. Likewise for the equal apparent diameter of the Sun and Moon in our sky - great for eclipses!
- 2) How the Earth itself is "just right," in our distance from our star, tilt of our axis, magnetic field, abundance of water 'n oxygen, protective but fairly transparent atmosphere.
- 3) Our (relatively) clear and dark skies here in NM... been to a big city or the east coast lately?
- 4) How we all have access to the original masterpieces as the ancients did and professionals do now, able to capture with our own eyes (or sensors) celestial photons that have traveled for hours or millions of years!
- 5) The reality that astro-toys are more plentiful and affordable than ever, and that liberal applications of \$\$\$ can overcome many observing and imaging limitations that have existed for decades.
- 6) The fact that any time I want I can put down the atlases, laptops, cameras, giant Dobs, etc, kick back and soak up the wonder of it all.
- 7) A not-so-well-kept secret: astronomers and astro-hobbyists all over are really a pretty neat group of folks - eager to share, assist, create and achieve, all the while avoiding big egos (for the most part).
- 8) Those who have gone before us, who have made such great strides in both the hobby and the science and have laid a splendid foundation for the next generation to build on, both individually and as a society.
- 9) Considering all that we know today - and we know a lot - much of it will eventually be proven wrong - that's how science works. Ultimately that will increase the quality and meaningfulness of our lives....
- 10) How, despite the age of glitz and "been there, done that" that we live in today, new folks are always coming along that have never seen or appreciated this stuff, often becoming just as enthralled with the universe as we are. *We need* the new blood...
- 11) A universe that is at the same time both dynamic and yet ageless - an unfolding drama, full of fantastic changing sights and discoveries, and yet constant, perpetual and patient as it waits for whenever I'm willing and able to approach it.
- 12) Last but not least - how observing the heavens is ultimately an act of gratitude and appreciation in which we recognize our smallness and yet our greatness in the cosmic drama - we are able, yes even invited, to stand in awe and reverence before the unfolding beauty of the sky above and have the privilege of entering into its secrets.

It just doesn't get any better than that.... have a wondrous holiday season!

Another Successful Year at Ye Olde Renaissance Arts Faire

By John McCullough

With tents and pavilions sprouting like mushrooms after a rain, the Dona Ana Arts Council Royal Realm for the 35th Annual Renaissance Arts Faire sprang up in Young Park on Friday afternoon, November 3. Steve Barks, Chuck Sterling, Rich Richins and John McCullough got together to transport and set up the ASLC "star booth" and do the preliminary arrangements.

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Arts Faire, continued from page 4

Starting early on Saturday morning, ASLC members in period costume, including Richard Jones, Vince Dovydaitis, Chuck Sterling, and Bert Verstrate in multi-colored wizards' garb, manned the booth in the Children's Realm for the fourth year in a row to give Ren Faire-goers a glimpse of several heavenly bodies. Under mostly clear skies, Faire attendees had a chance to view Jupiter and Saturn during the day. They got to see the Sun with sunspots in white light through Nils Allen's 4" wooden refractor and solar flares in H-alpha filtered light through Richard Jones' Coronado 60 mm solar scope. The younger set got to safely draw diagrams of the sun using a SunSpotter loaned to ASLC by Tim Billman for the weekend.



Faire-goers were treated to examples of ASLC members' astrophotography work, other astronomical art and posters, and a Dark Sky/Light Pollution display courtesy of the International Dark Skies Association. They got a chance to learn about the Astronomical Society and its near term activities. Teachers/educators could sign up to learn about star parties, and interested parties signed up for the upcoming Telescope Making Workshop. Although traffic by the ASLC booth seemed lighter than in past years because of a rearrangement of the Children's Realm, visitation remained steady throughout both days of the Faire. By teardown time on Sunday evening, all concerned were tired, foot sore, hoarse, and sunburned.



Thanks to Nils Allen, Steve Barkes, Dave Dockery, Vince Dovydaitis, Richard Jones, Rich Richins, Bill Stein, Chuck Sterling, Bert Verstrate, and all of the ASLC members that contributed to the set-up, tear down and operation of the ASLC star booth. Thanks also to those members who took time out of their busy schedules to share their knowledge and love of astronomy, put together materials, share images, set-up telescopes, provide moral support, and the numerous other contributions that made it possible for the ASLC to participate successfully in this year's Renaissance Faire. Just think - a little less than 12 months until next year's Faire!

Ceres, the First Asteroid

By Fred Pilcher

Ceres is the largest and first to be discovered (in the year 1801) of a large number of small solid bodies with orbits mostly between the orbits of Mars and Jupiter. These bodies are collectively called asteroids, or minor planets. The existence of a planet in this region had been conjectured by Titius von Wittenburg 1774, and later publicized by Johann Bode. A simple numerical relationship, now known as the Titius-Bode law or somewhat improperly Bode's law, approximated the semimajor axes all the planets through Uranus, except for a missing object between the orbits of Mars and Jupiter.

The actual discovery of Ceres on Jan. 1, 1801, was not a result of this prediction, but rather due to the diligence of its discoverer, Giuseppe Piazzi, in a program to catalog precise positions of faint stars. Piazzi systematically checked the accuracy of his measurements by remeasuring each star on a following night. He was a pioneer of this technique, which has more recently become standard scientific practice. One of his

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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, 2006

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Minutes, November 2006 ASLC Meeting

Vince Dovydaityus, ASLC President, called the meeting to order. Vince talked about his attendance at the Boston meeting of the American Association of Variable Star Observers (AAVSO). Vince participated in a discussion of IR detectors and the need for special IR filters at an AAVSO Working Group. He next led a discussion about the ASLC Christmas Party. The Party will be held at J.W. Flours Restaurant on El Paseo Road. There will be a buffet style service. There was a discussion and vote on the date and menu. The date will be Saturday, December 9, and the menu will be ham or fish (either salmon or some other). Cost is yet to be determined.

Dave Dockery mentioned that Meade donated a DSI-Pro digital imaging camera to the club. We will have a drawing for the camera at the end of the meeting open only to new members who signed up at the X-Prize. Rich Richins gave thanks to Chuck Sterling for making the display boards that were used at both the X-Prize and the Renaissance Faire. Rich hopes that the ASLC will be invited back to participate in next year's X-Prize. One recommendation is that the ASLC look at obtaining a high-contrast digital monitor that works well in bright sunlight. John McCullough thanked Chuck, Steve Barkes and Rich who helped in setting up and tearing down the ASLC booth at the Renaissance Faire. Our location in the Children's Realm did not draw big crowds. Vince stated that attendance at the entire Renaissance Arts Faire was down this year because of the entrance fee. Nils Allen thanked the ASLC members for continuing to support the public school star parties. More will be announced. Steve Barkes reported that Al and Marie Hughey and he went to the ASLC dome on NMSU campus. They lubricated the shutter and it now operates. The telescope is also operational and tracks. Steve recommended that we keep the observatory door locked and to lock the cabinet inside the dome.

For the evening program, Vince introduced Dr. Nancy Chanover from the NMSU Astronomy Department. Dr. Chanover gave a presentation entitled "Jupiter's White (Red) Oval(s)". Dr. Chanover talked about the history of the white formations that began in the South Temperate Belt around 1939 and today's status. Eventually three ovals formed and then merged into two and finally into one. High winds keep the ovals or storms confined to specific belts. The storms are essentially high pressure up-wellings. In February 2006, amateur astronomers alerted the professionals that there was a color change in the surviving white oval. Two groups of professional astronomers (one included Dr. Chanover) were able to obtain Director's Discretionary time on the Hubble Space Telescope (HST) to observe Jupiter. Her group used color analysis via the Principal Component Analysis to examine the new red oval to determine chemical content.

Vince invited new members to introduce themselves. There were a total of five new members present. Total attendance at the meeting was around thirty-five. Dave assisted Vince in the drawing for the Meade DSI-Pro digital camera. The winner was Mr. Francis Fiore.

Respectfully submitted by Bill Stein, ASLC Secretary

Ceres, continued from page 5

objects was not in its position of the previous night, and subsequent measurements revealed its planet-like motion. Ceres was soon called the fifth planet (in distance from the Sun). This is analogous to Pluto being considered the ninth planet following its discovery in 1930.

The value of always checking observations is shown because a century earlier John Flamsteed had observed Uranus four times, recorded as four separate Flamsteed number stars missing from modern catalogs. By not checking these measurements Flamsteed botched his chance to be the discoverer of Uranus.

In the next six years three more objects, Pallas, Juno, and Vesta were discovered and found to have orbits between those of Mars and Jupiter. Many astronomy books of the 1830s and 1840s listed Ceres, Pallas, Juno, and Vesta all as planets. As more asteroids were discovered in the late 1840s and into the 1850s and it became clear that a large number existed, the new category, "asteroid," became generally accepted for all of these objects and Ceres lost its status as the fifth planet.

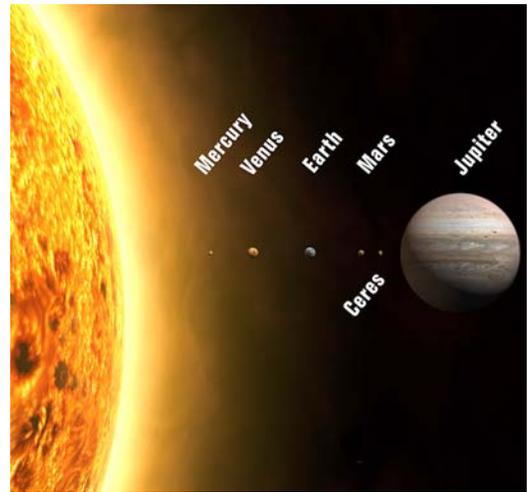
It should be noted that no theoretical basis for the Titius-Bode law has ever been found. That it works for our solar system is no more than a lucky accident. Ceres was found because it was there, not because there was any valid basis for its prediction.

The term "asteroid" was coined by Sir William Herschel because of the objects' completely stellar appearance in the telescopes of the time. Only in the past half century have physical measurements of the properties of asteroids become common, and today a great deal is known about Ceres and many other asteroids.

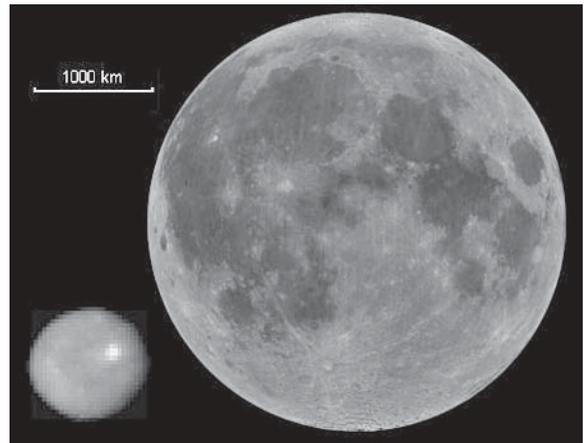
Starting about the year 1950 the techniques of photoelectric photometry began to be applied to asteroids, and Ceres was one of the early targets. Its magnitude was found to vary by 0.04 over a rotation period of 9.075 hours. This is a very typical asteroid rotation period, and has recently been confirmed by direct HST imaging of spots moving across its surface. J.-Y. Li, L. A. McFadden, and colleagues have published a map of Ceres color and albedo features, which is included with this article (see page 8) in a greatly contrast enhanced form. These observations also show that the equator of Ceres is inclined at only 3 degrees to the plane of its orbit, vastly smaller than the Earth's 23.5 degrees.

Ceres is sufficiently massive to exert measurable gravitational perturbations on Pallas and some other asteroids. This has permitted a measurement of its mass, 9.40×10^{20} kg, with an error of only about 1.4%. Ceres is estimated to contain about 1/3 of all the mass in the asteroid belt.

About 1980 Larry Lebofsky at Lunar and Planetary Laboratory found an infrared absorption band at 3 micrometers due to water of hydration on the surface of Ceres and some but not all other investigated asteroids. More recently a thin outgassing coma has been detected around Ceres. Ceres thus behaves like a comet!



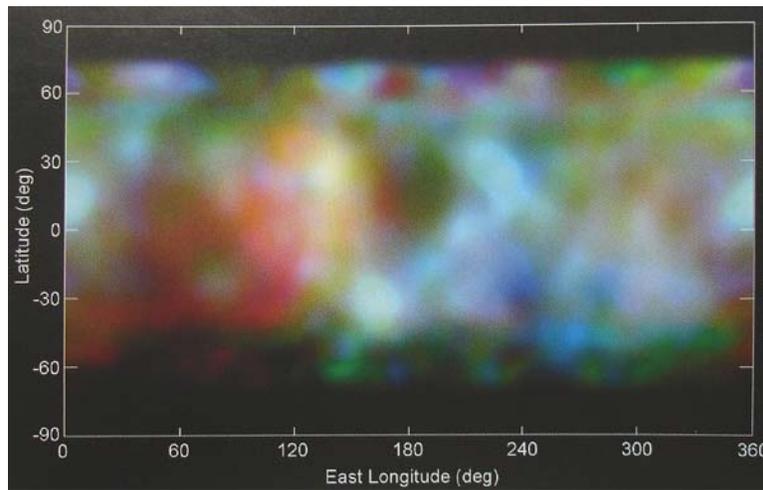
*Adapted from an illustration from the International Astronomical Union/
Martin Kornmesser*



*Ceres versus the Moon, from Wikipedia,
the free encyclopedia*

Ceres, continued from page 7

P. C. Thomas and colleagues in a landmark article in *Nature* in 2005 used HST images of Ceres to show that Ceres is within a few miles of a perfect oblate spheroid of equatorial diameter 975 kilometers or 605 miles and polar diameter 910 kilometers or 565 miles. Combined with its mass this yields a mean density of 2.077



Photometric analysis of 1 Ceres and surface mapping from HST Observations, Icarus 182 (2006) 143-160, by Jian-Yang Li, L. A. McFadden, J. W. Parker, E. F. Young, S. A. Stern, P. C. Thomas, C. T. Russell, and M. V. Sykes.

grams/cm³. A uniformly distributed mass with this density and rotation period would have a 25% greater polar flattening than is measured. This proves that Ceres is differentiated with a mass concentration toward its center. The relative diameters of core and mantle depend upon very uncertain assumptions of their densities. Ceres is expected to still show its ancient cratering record on its surface, although this is beyond the resolution of HST.

From the size, mass, and rotation period, the gravitational acceleration can be readily computed at 30.2 cm/s² at the pole and 26.3 cm/s² at the equator, about 3% of the value on Earth, and the equatorial escape velocity is 525 meters/s², all to an accuracy of about 5%.

The Dawn space probe is scheduled for launch in summer 2007 and after a visit to the second most massive asteroid Vesta is expected to reach Ceres in 2015. This should add greatly to our knowledge of its surface and interior composition as well as reveal its detailed history through direct observations of craters and other surface features.

Ceres had been classed in 1801 as planet #5, but by 1850 it lost its planetary status and became asteroid #1. In 2006 Pluto likewise lost its status as planet #9. But the same IAU action that demoted Pluto, promoted Ceres by virtue of its hydrostatic equilibrium shape to the dual status of dwarf planet while retaining its designation as asteroid #1. The stories of Ceres and Pluto are not yet finished! Keep tuned for the next exciting episodes!

2007 Texas Star Party - Sign up Now!

The great tradition of dark sky observing continues with the 29th Annual Texas Star Party, May 13 - 20, 2007. The TSP will be hosted on the magnificent Prude Ranch, a 3500 acre, mile-high ranch located six miles northwest of Fort Davis on Highway 118... 12 miles on the same road from McDonald Observatory. All over America, the search for dark skies is becoming a subject of great interest and concern for amateur astronomers. In many places when amateurs get together to observe the stars, they compare their skies to

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TSP, continued from page 8

those they once saw on this remote Texas ranch... little wonder! The skies in the Davis Mountains of West Texas are the darkest found anywhere in North America. Where else could one find so magnificent a view of Omega Centauri? High in the south and suspended against a sky that is the color of ink, the cluster is so spectacular through your eyepiece, you almost think you can reach out and touch it! Where else does the Sagittarius Milky Way rise over the mountains with so vivid a presence that you might mistake it for an ominous storm cloud? And what more natural setting could welcome amateurs than a frontier so remote and beckoning that Leslie Peltier himself once referred to it as “paradise”? It has to be Texas! The perfect place for the perfect star party... a huge gathering of more than 500



of the most serious astrophotographers and observers in the United States and beyond... the culmination of an odyssey that is worthy of all the dedication and stamina it takes to get there and to return - year, after year, after year!

TSP will not be mailing a flyer this year and registration will be on-line as described below.

1. You should submit a Registration/Reservation Request Form to enter the TSP drawing before January 20, 2007. This will provide you the highest possible chance of being selected as one of the 700 people who will be able to attend TSP this year. See <http://www.texasstarparty.org/draw.html> or fill out the Request Form immediately that can be found at <http://www.alphadata.net/cgi-bin/forms/forms.cgi?form=3>.
2. Participants at the Texas Star Party can select from a variety of accommodations on the Prude Ranch, including bunkhouses, private cabins, trailer hookups, and campsites with convenient bathhouses. All accommodations include access to a TV lounge, a western-style dining room, and an indoor swimming pool. And of course the convenience of the observing fields! For rates and more information on ranch and nearby accommodations please visit: <http://www.texasstarparty.org/travel.html>.
3. The TSP Registration Fee, which does not include your accommodations, is \$50/person if you pre-register before April 7, 2007. Each additional family member is just \$30 more. For more information about TSP Registration rates and policies, visit: <http://www.texasstarparty.org/tspreg.html>.

The drawing for names is in late January, and if your name is drawn you will get a link to a TSP Registration Form and optional Prude Ranch Reservation Form to send in with your payments in February/March.

Questions? Visit our web site for the latest and complete details! <http://www.texasstarparty.org/> or email tsprooms@texasstarparty.org . We look forward to seeing you next May!

Sincerely, the volunteers for Texas Star Party

Light Pollution Book for Children

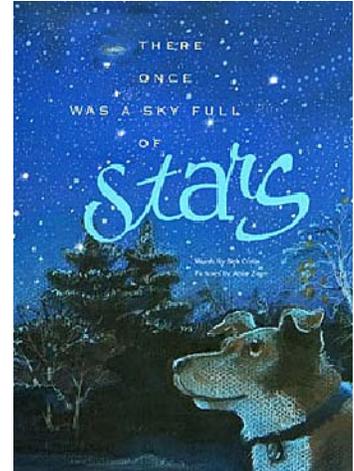
By Bob Crelin

As you may know, I've been very involved in dark sky efforts for the past twelve years. I've dedicated most of my efforts to dreaming up the best tools that help bring light pollution awareness/action into mainstream society. Here's some news on one of those tools. After selling out of a short paperback run, my children's

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Light Pollution Book, continued from page 9

book, *There Once Was a Sky Full of Stars* (Sky Publishing), has been reintroduced as a beautiful, large format hardcover book. This book is the first, lyrical children's book that teaches kids about the stars and fixing light pollution. The story's environmental message is simple, educational and unforgettable for young readers, listeners and parents, too! This hardcover release now has expanded distribution, which means that *There Once Was a Sky Full of Stars* is available to Barnes & Noble, Borders, and any other national book chain or local book store. However, because Sky is a smaller publisher, many stores have not heard of the book. This book can't deliver its important message if it is sitting in boxes in a warehouse.

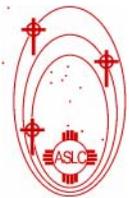


You can help greatly to get this book on the store shelves, into libraries, into schools, etc. Please encourage your club members, friends and family members to ask for it at your local book stores and libraries. The more places that stock it, the more LP awareness gets spread! Consider it as a gift to children, nieces, nephews, grandchildren, great grandchildren, etc., for the holidays. We might just change the world! For more information see: <http://bobcrelin.com/author.html>.

January Issue HDO

Articles for the January issue should be to me by Tuesday, January 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

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