

# SIRIUS ASTRONOMER

NEWSLETTER OF THE ORANGE COUNTY ASTRONOMERS  
See our web site at <http://www.chapman.edu/oca/>

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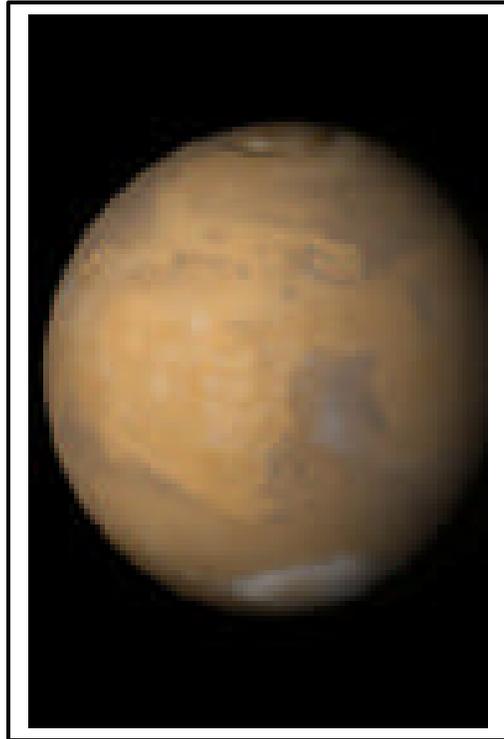


Photo of **Syrtis Major** (the dark region to the lower left) as mapped by the Mars Global Surveyor Mars Orbiter Camera. The device is a dual-mode camera: in narrow-angle mode, MOC uses a monochrome, super high-resolution telephoto lens for closeups of objects 1.4 meters across. In wide-angle, "global monitoring" mode the camera uses a fish-eye lens to generate color shots. This photo was taken during the calibration phase of the mission in March 1999. Photo courtesy of NASA/JPL/Caltech.

#### CHAPMAN MEETINGS

The next meeting of the OCA is on Friday, May 14, at 7:30pm in the Science Hall of Chapman University in Orange. The free and open meeting will feature OCA member Joel Harris, who will speak about "The August 1999 Total Solar Eclipse." There will also be a "What's Up?" presentation by Chris Butler, "Astronomy News" by Russell Sipe, and a raffle.

#### STAR PARTIES

The Silverado site will be open for observing on Saturday, May 8. The Anza site and Observatory will be open Saturday, May 15. Come prepared for cold weather --- dress warmly --- and if in doubt, check the satellite weather pictures before leaving town or call the observatory.

#### COMING UP

May 22<sup>nd</sup> is ASTRONOMY DAY!! Volunteers with telescopes are needed. Place & Time: Carl Thornton Park, Santa Ana, 7:30pm. The Orange County Fair is in July. Weeknight assistance is needed. Please contact Jim Benet, the Outreach Coordinator, at (714) 693-1639 or by email to [jimbenet@csi.com](mailto:jimbenet@csi.com) for more info on both activities.

# The President's Message

**by Wayne P. Johnson (aka Mr. Galaxy)**

Congratulations to our Explore the Stars (ETS) group organized by OCA Vice-President Russell Sipe for the recent national achievement awards from the U.S. Forest Service for their great effort in showing the sky to campground visitors on Palomar Mountain. We (the OCA) won a group regional award, while Russ won the individual regional award. Many OCA volunteers helped in this effort and hopefully Russ will point some of them out at our next meeting. Fred Coe from the USFS came to our April meeting to make these special presentations. You can read more about it on the OCA's webpage.

If it's May, it must be the beginning of Convention time! By the time you have read this I will have attended a Minor Planets Workshop in Flagstaff for a long weekend of informative lectures and socializing with some of the earth's foremost experts on asteroids and comets. A couple of weeks later I will be attending the Texas Star Party near Fort Davis (and the McDonald Observatory), Texas on May 9-16. Regrettably, I will miss the General Meeting because of that, but I hope to bring back some tall Texan tales about seeing 19<sup>th</sup> magnitude galaxies in a 6-inch telescope!

Some of you may have heard about the fairly large lay-off of people at my work (Boeing in Anaheim) where I was an electrical engineer involved in Test and Integration on the SBIRS (Space Based Infrared Satellite) project. On the way home from Texas I have a job interview with Raytheon in Tucson. I am glad to have the opportunity to return to Tucson, where I attended the University of Arizona and Pima Community College, but I am saddened at the thought of leaving many wonderful friends and my club responsibilities here in Southern California. Nothing is certain yet, but so far the only interview is in Tucson.

I hope that as many of you as possible make an effort to attend some of the Conventions, local and national, that are hosted by various organizations throughout late spring and into fall. Close by in Lake Arrowhead we have the smaller, more specialized IAPPP-West Symposium that is involved with CCD imaging and its scientific application. It's also a couple of days before the Mother of all Conventions, the Riverside Telescope Makers' Conference (RTMC). A few days ago we confirmed that Harrison Schmidt, one of the last people to walk on the moon and also the only geologist to visit there, will be our Featured Guest Speaker. It's a great honor and a highly unusual event to have a person of such stature come visit us. He is one of many great reasons to come see what the RTMC is about. Our newsletter editor, Chris McGill, will include an application for the RTMC in this bulletin and there is a section describing who to contact for these events. Please note that I may have an email address active by that time: [mrgalaxy@juno.com](mailto:mrgalaxy@juno.com), if I can find a modem and a computer that work at the same time!

I want to thank individual members of the OCA Board of Trustees and Astrophysics SIG members Gordon Pattison and Chris Buchen for their generosity in contributing \$500 toward a new set of 40 videos featuring Alex Filippenko of U.C. Berkeley that will be used as a foundation for the Astrophysics Special Interest Group's discussion meetings. They will also become part of the OCA's library and will be available for loan (please be very careful with them!).

Our Outreach Program, which is very ably administered by Jim Benet and assisted by an enthusiastic group of volunteers, continues to do great work by visiting schools, scout groups, churches and general gatherings, like the upcoming Astronomy Day on May 22<sup>nd</sup> at Thornton Park and the Orange County Fair in July. Because of a contribution from one of the groups, the Outreach volunteers were able to augment our show with the purchase of a set of slides from the Astronomical Society of the Pacific.

We have lots of great activities going on (too many to mention here), including the first-time trip to Wilson Observatory (contact Jay Glowacki) and the summer Star-B-Ques at our Anza observing site (which are always great), and don't forget about the ETS activities on Palomar.

One of my favorite remarks about the OCA is that it's the largest astronomy club in the universe because there haven't been any LGM's (little green men) to tell us any differently. We are certainly one of the biggest in the country, if not the world, but more importantly we are the best because of YOU, the individual member. Thanks for being in our universe!

# “Artists in Optics”

## A Book Review by Catherine Bailey Weinberger

Alvan Clark & Sons: *Artists in Optics*, by Deborah Jean Warner and Robert B. Arian, 2<sup>nd</sup> Edition, \$24.95, hardcover, 298 pages.

Those interested in the history of astronomy as well as those who appreciate a finely made telescope are likely aware of the contributions of the New England Yankee Clark family. Alvan Clark and his two sons, Alvan Graham and George Bassett created about 400 instruments between 1859 and 1958. They were arguably the finest telescopic instruments of their day. These telescopes found their ways into many private homes as well as the most illustrious observatories. Warner and Arian have collaborated together to trace not only the history of the Clark enterprise, but also catalog the known Clark instruments and their whereabouts, making this an invaluable reference work for anyone interested in antique and historic scientific equipment.

Alvan Clark was a New England Yankee in every sense of the word. Both of his grandfathers were whalers on Cape Cod and he was a Mayflower descendant on his father's side. He showed little interest in school, but he had unusually keen visual perception that manifested itself early on. He became an artist and supported himself by painting portraits in ink and watercolor soon after he left home. Later he studied engraving. But he felt he could not compete with the precision of photography, and by 1860 he closed the portrait portion of the business for good.

Clark became interested in astronomy through his future wife, Maria Pease, who was boarding with the family of Edward Hitchcock, a pastor of the Congregational Church. Hitchcock was also an avid amateur astronomer. Maria and Alvan were married in 1826 and had four children: George Bassett (1827), Maria Louisa (1829), Alvan Graham (1832) and Caroline Amelia (1835). But he did not become a telescope maker until 1844 when general interest in astronomy heightened due to the comet of 1843. Clark's son George was attending Phillips Academy at Andover, in preparation for attending Harvard. The dinner bell broke and George decided to melt down this bell metal to make a reflecting telescope. Alvan observed his son's work with growing excitement until he could be a passive observer no more. Within a few years, Alvan Clark had made several metal reflecting telescopes with apertures up to 8 inches. In 1846 he began to make lenses and within one year had gained enough expertise to locate slight errors in the 15-inch at Harvard. By 1848 he sold his first telescope, a 5-inch achromatic refractor, to Putnam Free School in Massachusetts.

The boys joined Clark in the business. George was the mechanic and designer, while Alvan and Alvan Graham were the opticians. Reproduced engravings taken from *Scientific American* 1887 illustrate their workrooms. In these Spartan rooms, they made objectives for some of the largest refractor telescopes in the world, including the 40-inch lens at the Yerkes Observatory.

Eventually they expanded their business and took on additional assistants. One was Carl Axel Robert Lundin, a Swede who was hired at the age of 23 and remained with the company until his death 41 years later. Alvan himself was active in the testing and final work until just a few years before his death at the age of 83 in August 1887. Both of his sons soon followed him, George in December 1891 and Alvan Graham in June 1897.

Because George died childless and Alvan Graham did not have what was considered then to be a suitable heir to carry on the business (his only son died at age 14 and his three daughters did not marry instrument makers), the business was incorporated in 1901 as “Alvan Clark & Sons.” Lundin remained in charge of the optics and was later succeeded by his son. W. W. Dinwiddie supervised the mechanical department. The elder Lundin died in 1915 and Robert Lundin left the firm around 1928. The company went into decline during the Depression. Eventually it was sold to Sprague-Hathaway Manufacturing. The grinding tools and other metal items were sold for scrap iron during World War II and the rest of the company liquidated and sold at junk values in 1958.

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# OCA News Flash!

## OCA and Russell Sipe receive National U.S. Forest Service Awards!!



Fred Coe of the U.S. Forest Service presents the National Certificate of Achievement Award for Contributions to Forest Service Programs over the last four years to Wayne Johnson on behalf of the OCA and the National Certificate of Achievement Award for Contributions in the “Explore the Stars Program” to Russell Sipe. Both awards are from the Chief of the U.S. Forest Service. Photos by John Rigoni.

### Also...

Chris Butler, Artist and OCA member, held an Art Sale March 20 at his parents’ home in La Habra, with many new works included. Photo by John Rigoni.



# Beginners' Class

by **Christine K. McGill, Editor**

The Beginners' class is held the first Friday of every month at 7:30p.m. at the Discovery Museum trailer in Santa Ana (Harvard and Fairview streets). The meeting is open to OCA members and to prospective club members as well. It is very ably taught by club member Don French, who also participates in outreach activities, star parties at Anza, and the Explore the Stars program. Don, a retired applications programmer, lectures in a friendly style, often making use of a whiteboard to draw illustrations. Topics usually cover observing and telescopes, because attendees tend to have recently-acquired telescopes. Don brings his own 8-inch Dobsonian, and Antonio Miro, who attends regularly and helps out, brings his 6-inch reflector. Thus, class members are allowed the opportunity to stargaze during their very first club contact.

The April 2<sup>nd</sup> Beginners' class was held only a day after the appearance of an article by Gary Robbins, the science journalist for the Orange County Register, which highlighted the club and its activities. Nearly 40 club members and visitors crowded into the trailer, seating themselves on chairs, couches, desks and even the floor. Some also stood for the entire 90 minutes of the class. They ranged in age from 11 to 70+. Many brought Gary's article along with writing tablets, and one person even brought his binoculars. About one-fourth were telescope owners. Don and Antonio had been showing the beautiful Orion Nebula in their telescopes. OCA President Wayne Johnson was also in attendance; he opened the class with a brief introduction to the club. Don followed, pointing out that every beginner should start observing with a pair of binoculars as the basic learning tool. Binoculars help the beginner to learn his/her way around the sky. Once the beginner has done this for a while, he/she can move on to a telescope, or for some, an even larger telescope. He included mention of the planisphere as an aid in learning the nighttime sky, but cautioned that the planisphere cannot be used to find planets.



**Don French at Anza site**

Don remarked that a telescope accomplishes two things: it amplifies light, and it increases the detail of an object. He went on to discuss some of the differences between refracting and reflecting telescopes, pointing out that the reflector costs less, but it also causes light dispersion when the light strikes the eyepiece, which is a lens. The refractor has very good contrast ability, but its cost is greatly increased. Also, due to the fact that it has a lens as its objective, it causes incoming light to bend and to split itself into many different colors, each color having a separate wavelength. To compensate for this, some refractor designs use a secondary mirror to blend the light back into one color. Wayne assisted in the discussion by commenting further on the structure of Schmidt-Cassegrain telescopes. The discussion also included telescopic finders, and Don talked about finder scopes and the Telrad device, which uses a series of concentric circles as an aid in finding objects.

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# Virtual Astronomy

**by Dave Kodama**

## “Shallow-Sky” Astrophotography

In last month’s column, I listed several sites for QuickCam astrophotography. But this is just one corner of the general topic of video astrophotography, which seems to be growing in interest as the cost of equipment comes down. For more on this “shallow-sky” segment of astrophotography, see Jim Ferreira’s web page:

<http://www.fortunecity.com/victorian/canterbury/222/astro.htm>

Here, you’ll find good tips on starting out, some great examples of video photos, links to other video astrophotography pages, and links to suppliers of equipment. Jim Ferreira also started an email discussion list that you can join via a web page form at egroups.com:

<http://www.egroups.com/group/videoastro/>

## More Star Charts

A few columns ago (Feb. 1999) I listed some electronic star charts available for your PC. However, one glaring omission was Home Planet by John Walker. While not the best available star chart, the price is right (FREE!). This program can be obtained at his primary site in Switzerland or his mirror site, which is physically located in the U.S., but has a virtual address in the Kingdom of Tonga! The Tongan mirror site should be faster for those of us in North America.

<http://www.fourmilab.ch/> (Switzerland)

<http://www.fourmilab.to/> (Tonga)

While you are there, be sure to check out the rest of the web site. Walker also has online star charts, a moon browser, and a whole host of interesting free programs and online utilities covering not just astronomy but many other areas of science. Of special interest to you might be his slide show screen saver:

<http://www.fourmilab.to/slidescr/>

This program allows you to put your favorite (astro) photos in a directory, then sequences through the photos whenever your screen saver kicks in. Again, you can’t beat the price (free).

Other sources for online star charts are:

<http://www.mtwilson.edu/Services/StarMap/> - postscript maps (Mt. Wilson Observatory)

<http://www.polaris.net/services/starchart/> - postscript maps

<http://www.outerbody.com/stargazer/> - requires Java

Note that the star charts generated by the servers at the first two web sites are in postscript format which requires viewing software capable of interpreting postscript. Alternatively, the star charts can be directly copied to a postscript printer.

Coming Up...

And finally, a reminder... don’t forget that May means the Riverside Telescope Makers’ Conference (RTMC) is near. Since this year’s event is close to a full moon, the theme is the moon! Details can be found on the RTMC website:

<http://www.rtmc-inc.org/>

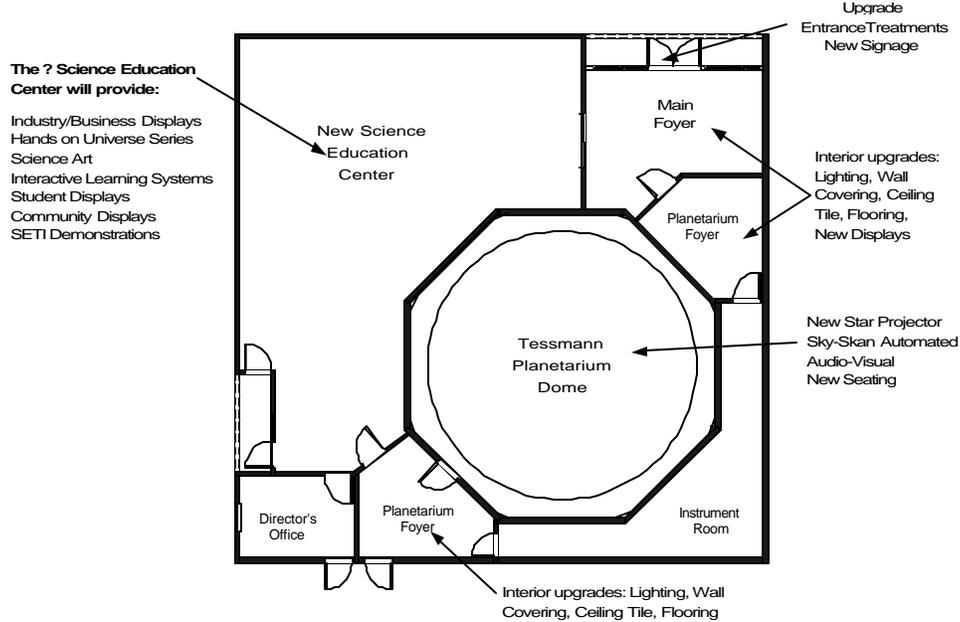
# Planetarium Update

by Don Prescott

I have been meeting with the Santa Ana College administration as part of a group planning the future of Tessmann Planetarium. As many of you know, the facility is over thirty years old and showing its age. Last year, the school administration approved a strategic plan for the upgrade of the planetarium. Dr. Stephen Eastmond and I made a presentation in August to the RSCC Foundation Director, Peter Bostic, who is a key individual for fundraising activities at the college. That presentation launched the Foundation's active participation in the tactical planning currently in progress.

Our plan has expanded beyond the original planetarium upgrade by including a Science Education Center with interactive learning capabilities for K-12 school classes, college class instruction and public show presentations. As shown in the figure below, the Science Education Center will be housed in the Planetarium Building on campus. Also annotated are planned specific upgrades.

## *Proposed Science Education Center And Tessmann Planetarium*



The star projector (down-select process) decision is progressing nicely. It is important to select a star projector that has an excellent sky, user-friendly features and attractive maintenance considerations. We have visited Santa Monica's Drescher Planetarium to see the Evans and Sutherland Digistar, San Bernardino to see a GOTO projector and Victor Valley where we had a demonstration of a Ziess. Additional trips are planned to see a Spitz 1024 in Northridge. We expect that a firm decision will be made this summer. In the meantime, the team at the college is developing funding plans.

The upgraded planetarium and new Science Education Center are planned to provide aggressive programming schedules for K-12 children, increased college class availability to the planetarium and revived public shows on evenings and weekends in about 18-24 months after completion. Dr. Eastmond and I anticipate that we should be able to make a presentation at an OCA General Meeting late in the summer or early fall. We will discuss all aspects of the project from the proposed new star projector to the operating plans for public programming, which will need volunteers from the community and, specifically, the Orange County Astronomers.

# Space Update

## Gathered by Don Lynn from NASA and other sources

(To find out more on these topics, or those of past months' columns, through the World Wide Web, send your Web browser to our OCA website: <http://www.chapman.edu/oca/>, and select Space Update Online.)

**ASCA (Japanese-US X-ray telescope satellite)** - has discovered middleweight black holes, with masses 100 to 10,000 times that of the Sun. Black holes, regions where gravity is so powerful that nothing can escape, not even light, have only been found until now in large stellar masses, or they have been supermassive, equivalent to millions of stars. This is the first discovery of black holes in between these two classes. The stellar mass black holes formed from collapsing individual stars that ran out of fuel. The supermassive black holes formed either from large collapsing gas clouds or from collapse of whole clusters of stars. They have been found in the center of about 1% of galaxies examined, and are probably the energy source for active galactic cores and quasars. The best theory on formation of the middleweight class is that hundreds or thousands of stellar black holes and neutron stars have merged after they formed. The spectral X-ray evidence for the new class, some of which also came from the ROSAT X-ray satellite, was found in many spiral and irregular galaxies, including M82.

**Comets** - A new study done with the Owens Valley Radio Telescopes, arrayed for interferometry, has determined that the water in comet Hale-Bopp does not match the water in Earth's oceans, so the theory that the oceans were principally formed by water from comets is probably wrong. The difference in the water lies in the amount of heavy water found among the ordinary water. Heavy water has deuterium substituted for ordinary hydrogen, deuterium having an extra neutron in it. The comet has a much larger percentage of heavy water than our oceans. The telescope array was able to resolve, for the first time ever by radio telescopes, the individual jets of matter, mostly water, coming from the nucleus of the comet, and analyze this material fresh from the comet interior. Another conclusion from the study was that 15 to 40% of the comet material was primordial material present before the Sun formed.

**Galileo (Jupiter mission)** - has found hydrogen peroxide, the same chemical that turns hair blonde, on the surface of Jupiter's moon Europa. The near-infrared mapping spectrometer identified hydrogen peroxide by its spectrum. In the past, Galileo has found sulfur dioxide, water ice, carbon dioxide, and possibly salt on Europa. Because hydrogen peroxide breaks down within weeks or months from ultraviolet light or contact with many other chemicals, there must be a constantly-forming supply of hydrogen peroxide on Europa. It apparently forms from Jupiter's intense particle radiation striking the icy surface and rearranging the chemicals there.

Jupiter (and therefore Galileo) during April passed behind the Sun (as seen from the Earth). The radio noise that the Sun makes interrupts communication with Galileo for about 3 weeks during this time, but normal communication has resumed.

The Galileo team determined that the computer "safe modes" that occurred in July and November of last year, as well as certain earlier times, were caused by an erroneous power reset signal that resulted from debris in the electrical connections between the spinning and non-spinning parts of the spacecraft. They have prepared a program to be loaded into Galileo's computers that identifies this condition, and automatically recovers from it without intervention from Earth. This new program should be loaded by the time you read this. If this situation occurs again, Galileo will not lose a few days of planned data gathering or data transmission to Earth, as occurred in the past.

**Hubble Space Telescope (HST)** - has produced a dramatic time-lapse movie showing seasonal changes on the planet Uranus. In contrast to the Earth's 23-degree tilt, causing the seasons we are familiar with, Uranus is tilted almost on its side, resulting in extreme seasons. Essentially the entire planet gets  $\frac{1}{4}$  to  $\frac{1}{2}$  of a Uranus year of darkness (like Earth's poles) followed by a period of day-night cycles, and then a similar period of continuous light. But remember a year on Uranus takes 84 Earth years. When the sunlight returns in spring, waves of massive storms occur, the size of half the U.S., with temperatures of -300 degrees, and clouds of methane ice crystals. Back when Voyager flew by in 1986, the equivalent of 2 Uranus months ago, the atmosphere was nearly featureless, but now storms are evident. The HST movie captured all this, as well as showing the wobble in the rings around the planet. The wobble is caused by gravitational tides from the planet's equatorial bulge and from the moons.

**Mars Global Surveyor (MGS)** - For those of you holding your breath since last month's column, wondering if the MGS high-gain antenna would deploy in late March, after reports of problems with similar deploying equipment on other spacecraft, breathe easy. It worked perfectly. We now have the ability to simultaneously study Mars and communicate with Earth. The plan is to gather information, including mapping images of Mars, continuously to the recorder, then radio the information to Earth during a high-speed transmission lasting 10 hours per day. Full-scale mapping began on April 4, and the spacecraft will make a nearly constant stream of observations of Mars for the next 2 years. As we go to press, one of the joints in the arm holding the high-gain antenna has locked up, sending MGS into "safe mode", and interrupting the mapping. You can all hold your breath again until next month's column to see how this one turns out.

**Mars Surveyor 2001 Lander** - In an Earth-based experiment, scientists have successfully made oxygen from a simulated Mars atmosphere, using a simple electronic ceramic catalytic device. In future robot or manned missions, this technique could provide oxygen for breathing or rocket propellant. The same experiment will be aboard the Mars Surveyor 2001 Lander spacecraft to be tested on the surface of Mars. The simulated atmosphere resembled Martian atmosphere at night, consisting of 95% carbon dioxide, at pressure less than 1% of Earth's atmosphere, and at -105 degrees F. Mars Surveyor 2001 will also explore the mineralogy of its landing site, near the Martian equator, taking images in visible and infrared, analyze the Martian soil and surface radiation, and deploy a rover.

**Deep Space 1 (asteroid mission)** - is the first of the New Millennium missions, which are designed primarily to test risky technology, and secondarily to observe targets in space. It has demonstrated completely 7 of its 12 technologies, including the ion propulsion system, advanced solar array, new communications techniques, new microelectronics and new spacecraft structures. All have worked successfully, though several with startup glitches. For example, the ion engine shutdown after about 4 minutes, but was eventually restarted and logged more than 1300 hours of flawless operation, propelling the spacecraft toward its rendezvous with asteroid 1992 KD late this July. By summer, the remaining technologies will be completely tested, including an automatic navigation system using star images, a combination camera and spectrometer, and an advanced instrument that studies electrically charged particles. A stray light problem was found with the camera/spectrometer, but it should produce acceptable images during flyby, since the stray light seriously affects only time exposures longer than are planned during the flyby. NASA is considering a possible extended mission that would take Deep Space 1 on flybys of two comets in 2001.

## MAY'S FEATURED SPEAKER



**Joel K. Harris**

President, Twilight Tours, Inc.  
Member, Orange County Astronomers

Former Secretary of the OCA Board of Trustees, Joel K. Harris is a veteran amateur astronomer, solar eclipse observer, and astrophotographer, with over 25 years background in traveling to, lecturing about, and studying solar eclipses and the nighttime sky. A member of various astronomy-related societies and contributor to both *Astronomy* and *Sky and Telescope* magazines, Joel's first book, (with *Astronomy* magazine's Richard Talcott), "Chasing the Shadow - An Observer's Guide to Eclipses", was published in May 1994. Joel has observed a total of 13 total and two annular solar eclipses, starting in 1973. His travel company, Twilight Tours Inc., has conducted expeditions since 1984 to solar eclipses in the Coral Sea, Indonesia, Southern Baja Mexico, Uruguay, Bolivia and Venezuela. He also has led trips to Chile and Australia/New Zealand to observe Comet Halley in 1986. By the way, this accomplished OCA member actually has a job, working as a systems engineer for Boeing-Rocketdyne on the International Space Station Alpha program.

He writes: "Basically, I am going to be speaking about the August 1999 Total Solar Eclipse---or, using my own sobriquet, 'The Great August 1999 Pre-Millennium Total Eclipse'. This talk will be strictly a FYI type of presentation. While I do run and head up Twilight Tours Inc, this presentation is meant to simply cover the basic parameters of this, the last total solar eclipse of the 20<sup>th</sup> century. I will particularly focus upon the predicted path of totality, primary observing areas for the event, travel considerations to consider when going to the eclipse, and finally, some practical suggestions as to how to pack and prepare for this eclipse." Joel can be reached at 818-615-0889 and by email: [eclipse@cerf.net](mailto:eclipse@cerf.net).

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#### Book Review, cont'd.

Despite this unhappy end of the company itself, the Alvan Clark & Sons legacy lives on in the telescopes they made. Part II of the book lists every known Clark instrument and its provenance, beginning with Mary Gertrude Mead Abbey, a "learned, cultured and ambitious woman" who bought a 5-inch refractor in 1871. Maria Mitchell (America's first woman astronomer) placed the order and the telescope is now at the Nantucket observatory that bears her name. To read through the catalogue descriptions is to read fascinating bits of historical astronomical trivia complete with many black and white photographs. Part III lists the instruments by size and date of manufacture.

Parts IV (an essay concerning the Clark customers) and V (technical points concerning the smaller telescopes) offer further detail of interest to a Clark aficionado. For example, there are detailed descriptions of the signature changes of various instruments over the years. Finally, Part VI catalogues the known Clark portraits with several illustrations of his work. They reveal someone with a fine gift for detail, regardless of the medium in which he worked.

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#### Beginners' Class, cont'd.

Don talked about telescopic mounts, comparing the differences between the altazimuth mount and the equatorial mount. Although the altazimuth mount has only two bearings for the two directions in which the scope may be pointed, the problem, Don noted, is that the sky is not altazimuth---it's an arc! Furthermore, you cannot take timed exposures with an altazimuth telescope. In contrast, the equatorial mount follows the rotation of the earth by lining up with the earth's equator and the North Pole. A motor allows the user to track an object's movement by compensating for the curvature of the sky. The equatorial mount also allows photography. At this point, Wayne and Antonio showed how stable and low-tech the equatorial mount is by using Antonio's telescope as an example. Wayne briefly described secondary mirror collimation, adding this is a subject for another class! In summary, Don noted that the "ideal" telescope is really the one the user can afford (including the cost of making one). The ideal scope should also satisfy the needs of its owner: for viewing the solar system, a wide aperture scope may not be needed. Instead, high magnification is what is needed. For viewing deep sky objects, the user needs a great amount of incoming light in order to see detail. Don talked about magnification as a function of the telescope's focal length, and noted that the physical size of the telescope will limit the amount of magnification you can get (magnification = focal length of telescope/focal length of eyepiece). He said that his own 8-inch has a 200 power limit.

The class attendees were very interested in the topics covered by Don, raising many questions after he concluded his talk. Everyone was encouraged to attend the general meeting and to return next month to the Beginners' class to discuss telescopes in greater detail. After the class ended, folks crowded around all of us with more questions, and several were in no hurry to leave, even though they had been patiently sitting still for over 90 minutes. It was obvious that the Beginners' class is an excellent introduction to the basics of astronomy.

# ASTROLLANEOUS

**1999 IAPPP Western Wing Conference Announcement and Call for Papers on Photometry, CCD Imaging and Related Topics.** The 18th Annual International Amateur-Professional Photoelectric Photometry (IAPPP) Western Wing Conference (IAPPP-West) will be held this year at the Mile High Lake Arrowhead Resort on May 26 – 27 just prior to the 1999 Riverside Telescope Makers Conference (RTMC) in Big Bear. Anticipated topics include: Adaptive Optics, Remote telescope operations, CCD Photometry and Astrometry, and Advanced CCD Imaging Techniques. Persons interested in making a presentation or participating are urged to contact: Wayne Johnson, 21870 Mary Street, Mead Valley, CA 92570, (909) 653-8813; [mrgalaxy@juno.com](mailto:mrgalaxy@juno.com) or Bob Bell at "What In The World," P.O. Box 1767, Lake Arrowhead, CA 92352, (909) 337-5080; [arrowheadbob@earthlink.net](mailto:arrowheadbob@earthlink.net); fax (909) 337-6134.

**Riverside Telescope Makers Conference (RTMC).** The 31st Annual RTMC (Riverside Telescope Makers Conference) will be held Friday, 28 May 1999 through Monday, 31 May 1999 (Memorial Day weekend). It will be held at the Y.M.C.A. Camp Oakes (eight miles east of Big Bear City on Highway 38 at Lake Williams Road – which is between mileposts 44 and 45). This location is about 50 miles northeast of Riverside in the San Bernardino Mountains. Follow Highway 38 east and north off Interstate 10 in Redlands. A map will be mailed with your registration confirmation. For more information, see the website: <http://www.rtmc-inc.org/>.

**JPL Open House, June 5-6, 1999, 9 a.m. - 4 p.m.** The Jet Propulsion Laboratory, an operating division of the California Institute of Technology, and a field center of the National Aeronautics and Space Administration, invites the public to its annual open house. Visitors will see exhibits, displays, demonstrations and presentations about space exploration of the past, present and future. Learn about planetary imaging, space robotics, spacecraft communications and tracking, and much more from the experts themselves. Children can participate in hands-on activities. Food, beverages and souvenirs will be available. Directions: Go to Pasadena. Take the 210 Freeway West (toward La Canada Flintridge), exit Berkshire/Oak Grove Drive, and follow the signs. JPL, 4800 Oak Grove Drive, Pasadena, CA 91109. Call (818) 354-4700 for more details.

**The 1999 Astronomical League will be holding its 52nd annual convention, ASTROCON '99, "A Thousand Years of Stars & Space",** at Eastern Washington University in Cheney, Washington, just outside Spokane, July 13<sup>th</sup>-17<sup>th</sup> 1999. This will be the first time in 10 years that the convention has been held in the Northwest and 8 years since being held on the West Coast! The long list of speakers includes Dr. F. Story Musgrave, Astronaut and HST primary repair mission specialist, Dr. Donald Parker, President of ALPO (Association of Lunar & Planetary Observers). Besides the speakers, there will also be many workshops and activities. For more info, check out the website: <http://www.SpokaneAstronomical.org/astrocon99>.

# CLASSIFIEDS

Free: **8-inch mirror blank and tool (partially ground).** Cleaning out garage, if U can use it, U can have it. Email [Jaxdon@earthlink.net](mailto:Jaxdon@earthlink.net) or call (949) 768-6602.

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# ASTRONOMER

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