

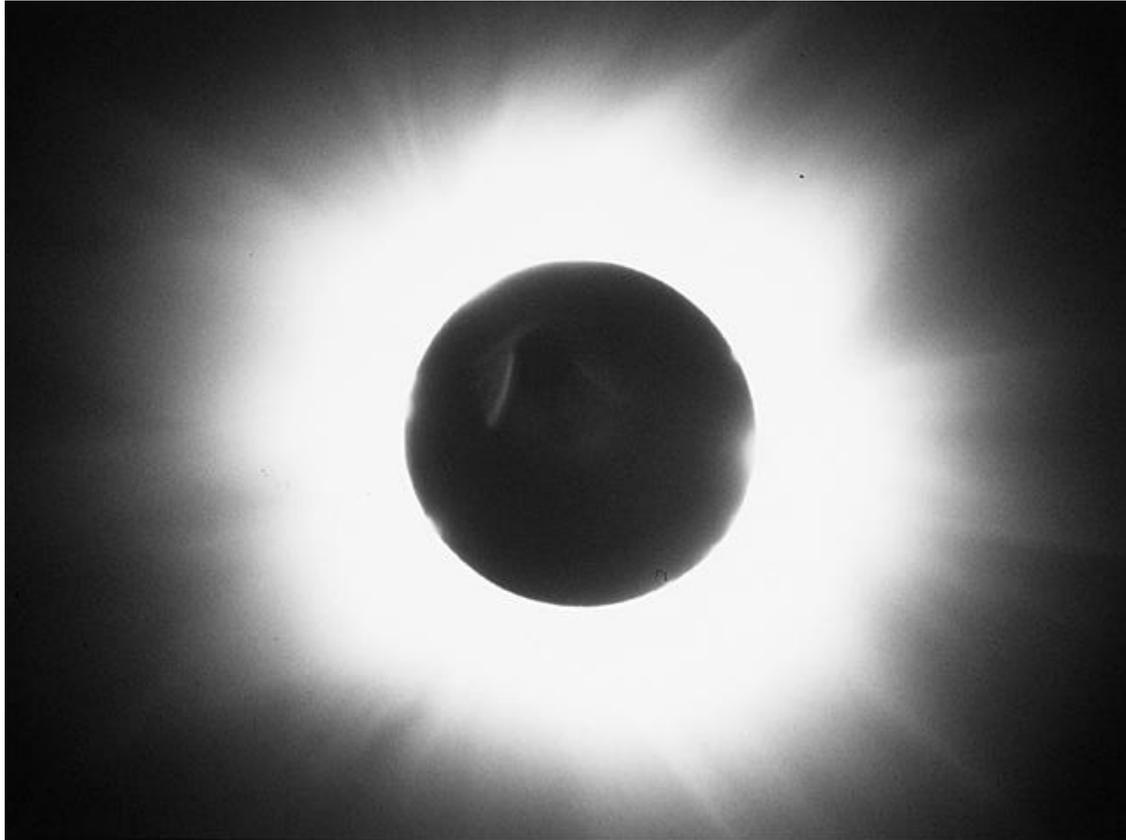
SIRIUS ASTRONOMER

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

September 1999

Free to members, subscriptions \$12 for 12 issues

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OCA Member Dave Kodama's exquisite photo of the August 11, 1999 eclipse was taken from Harput Castle near Elazig, Turkey (8/11/99). The photo is a 1/2second exposure on Ektachrome 400 slide film using a TeleVue Pronto with flattener and 2X tele-extender. See more of Dave's stunning photos at his website: www.eanet.com/kodama/astro.

CHAPMAN MEETINGS

The next meeting of the OCA is on Friday, September 10, at 7:30pm in the Science Hall of Chapman University in Orange. The free and open meeting will feature geologist Dr. Gary Peterson, who will discuss "Collisions of Comets and Planets," and reports from the August 11 OCA Eclipse Chasers.

STAR PARTIES

The Silverado site will be open for observing on Saturday, September 4. The Anza site and Observatory will be open Saturday, September 11, and we will be holding a Star-B-Que. Check weather information before leaving town or call the observatory.

COMING UP

The Explore the Stars program will be held Saturday, September 18. Contact Bob Gill for details. The Starry Nights Festival will occur Oct. 15-16 in Yucca Valley near the Joshua Tree Nat'l Monument. The OCA Annual Banquet will be held Oct. 17 and will feature extensive reports of the August 11 Eclipse.

President's Message

by Russell Sipe

In the foreground the Reuters news photo showed the countdown clock frozen at six seconds, in the background the *Columbia*, bearing the oft-delayed Chandra X-ray Observatory, sat bathed in floodlights. In Cambridge MA the Chandra Control team let out a huge sigh of disappointment. Another delay for Chandra. The event that caused the launch "cut off" turned out to be a faulty hydrogen level reading at the shuttle engine nozzles. Three days later the mission got off the ground, literally, with a deep throated earth-shaking roar, producing great relief for astronomers world wide. In only a few weeks our understanding of the universe will go into hyper-drive as Chandra will make possible more detailed studies of black holes, supernovas, and dark matter and increase our understanding of the origin, evolution, and destiny of the universe. Piece of cake, right? Although it has taken longer than expected to get Chandra "in the hunt" the wait will have been well worth it.

Recently my daughter and I participated in mock sea battles off Long Beach Harbor between four of the twelve tall ships that were in the Southland as part of the 150th anniversary of the California Gold Rush. The thing about large sailing ships is, they don't turn on a dime. Unlike the myriad of pleasure craft that sailed circles around the big ships that day, it takes advanced planning and time to turn these massive vessels. It was quite enjoyable watching the captain of the SS *Californian* as he maneuvered his ship, gauging the wind, outguessing the opponent, marshalling the crew, to bring his guns to bear.

So what does all this have to do with Orange County Astronomers? Just this: we are a large club, the largest local astronomy club in the country. Although we have the potential to pack a big wallop, we need to clearly define our targets and make the necessary course changes to bring those targets into our sights. It may take a ship as large as ours longer to set a course and reach our target, but I think the wait will be worth it.

As the new captain at the helm of the OCA I am proud to follow in the footsteps of my predecessors. I have a lot of ideas. But ideas are cheap. Making good ideas work is the real measure of success. I, along with the OCA board, will carry on the month to month routine that keeps the club operating. I will also be working with the board and other interested parties to plan for future projects with the dual vision of enabling OCA members to participate in real science on the one hand, and to reach out and grow the hobby on the other.

I recently returned from the Partners in Astronomy conference in Toronto. Although I was aware of several programs aimed at bringing new people, in particular youth, into the astronomy field, I was not aware of just how much was being done in this area. I have heard speeches and read articles in the past few years about the "graying of the hobby", about how the average age of an amateur astronomer is forty something and getting older every year. Well, I think the trend is changing. And I want OCA to be part of this great effort. Our current public star parties and our support of future Tessmann Planetarium programs provide teasers that create interest. For those who are interested in getting into the hobby we have our beginner's class that does a great job discussing telescopes and observing techniques. And our astrophysics group discusses and studies more advanced topics. But we need a more broad-based program designed to take the spark of interest in youth and adults and nurture it into a flame, a program that will bring all these elements together into a cornucopia of astronomical delights. You will be hearing more about this in the months ahead. Our target is in sight, prepare to "come about". Godspeed to Chandra. Godspeed to OCA.

"The Goodness of the Night Upon You"

Othello Act 1 Scene 2

Russell Sipe



41017 Years and Counting...

by **Don Prescott**

As we near the millennium, SETI (Search for Extraterrestrial Intelligence) has brought new meaning to distributed processing with the SETI@Home program. As of August 2nd, 935,885 people worldwide have put 359,308,895 hours, or the equivalent of 41,017 years, of idle computer time to work analyzing data from the Arecibo Radio Telescope.

Recently, along with 2,569 other people reporting 31 results, I ranked 71735th place out of 931,885 SETI@Home participants. There were five members of the Orange County Astronomers (OCA) who ranked higher with seven moving up fast. Thirteen OCA members have reported 565 results logging over 24,594 hours of CPU time.

While the amount of data processed increases the odds that you might find the first signal from an extraterrestrial intelligence, each set of data analyzed could contain the magic signal. Every moment of analysis puts humanity closer to answering that nagging question, "Are We Alone?" That question has been at the core of human thought since our ancestors first wondered what was in the night sky. If an intelligent signal is discovered, our civilization will likely never be the same again. If such signal is not found, that is an answer unto itself and the search will go on.



The 305-meter Arecibo Radio Telescope in Puerto Rico. Arecibo Radio Observatory photo.

What happens if the data you analyze contains the coveted signal? If it is confirmed, the SETI@HOME folks will send a telegram to the International Astronomical Union with the pertinent data including who found the signal. The person(s) discovering the signal on their screen saver will be named as the co-discoverer along with others from the SETI@Home team. Remember, at that point, we will still be unsure if the signal was generated by some new astronomical phenomenon or somebody welcoming us to the galactic community. It is very important that SETI@HOME participants do not get excited and go off making their own announcements.

The implications of this program may extend far beyond the current project. There is a lot of sky to survey and it is a different sky every minute. You don't know when the first signal will reach Earth. The data is continuously being received in quantities far beyond institutional computing capacities. How many personal computers are waiting to help?

With the internet, the enormous potential of distributing analysis work to the public---already demonstrated by the nearly one million people who are voluntarily using their computers for SETI@Home work---has barely been tapped. Medicine, mathematics and the other sciences are accumulating data that may someday find its way to idle computers. The possibilities are staggering. Even if no significant signals are discovered as a part of this particular program, a new way to harness idle computing power has just been born. Actually, the new baby is just learning to crawl!

To download the screen saver software, you can simply visit the website at (<http://setiathome.ssl.berkeley.edu/home.html>) and choose the software for your operating system. At the SETI@Home site, practically anything that you will want to know about the program is readily available. OCA members can sign up to have their results become a part of the OCA group through the OCA web site (<http://www.chapman.edu/oca/>). Join us in the search!

OCA BANQUET FEATURES AUGUST 11th ECLIPSE STORIES!!!!

The Banquet will be held **Sunday, October 17** at the Orange County Mining Company at 6:00 p.m. Tickets are \$30 and available at the September and October meetings or by mail from Charlie Oostdyk, P.O. Box 1762, Costa Mesa, CA 92628. If you'd like to help Banquet Coordinator Suzanne Hall, she can be contacted at (714) 961-7400.

OCA BOOK REVIEWS

by Catherine Bailey Weinberger, OCA Librarian

The OCA has recently acquired many new books that should be of interest to members. Here are some of the highlights:

In honor of the 30th anniversary of the first walk on the moon, Michael Light has put together a marvelous collection of photographs of the Apollo journeys in a coffee-table volume. NASA has allowed some of the 32,000 original photos to be scanned electronically and the results are breathtaking. *Full Moon* is a beautiful portrait of this great achievement.

A good companion to the pictorial essay is Andrew Chaikin's book *A Man on the Moon*. This book was the basis for the HBO miniseries "From the Earth to the Moon." Actor Tom Hanks wrote the foreword. *The Last Man on the Moon* gives us insight into the Space Race from an astronaut's point of view. Former astronaut Gene Cernan tells us of his adventures from being the first person to spacewalk all the way around the world to being commander of Apollo 17. Of course, space exploration doesn't happen without all the scientists and engineers who make the dream a reality. Jeffrey Kluger tells us of the cutting edge people at NASA's Jet Propulsion Laboratory in Pasadena, California who make space exploration missions happen. *Journey Beyond Selene* is fascinating reading.

For those who view space from the ground instead of the moon, the classic favorite of novice stargazers *Nightwatch* has just been published in its third edition. Terence Dickinson has included revisions that extend its use to the year 2010. Just in time for the solar eclipse (well, almost): *Totality: Eclipses of the Sun*, 2nd ed. is the authors' attempt to capture "the total eclipse experience." However, this is more than just an essay. The book is also packed with practical information that makes it an important reference tool.

The second edition of *Star Ware* has just come out. This meaty book contains a wealth of information for amateur astronomers who need a guide to choosing and using telescopes and telescope accessories.

Astrophotography for the Amateur has just been published in its second edition. Michael Covington's classic work is one of the finest books ever written for astronomers interested in learning to capture astronomical images on film.

The Elegant Universe gives us Brian Green's thoughts on superstring theory and the quest for the ultimate theory of everything, a.k.a. the unified field theory that Einstein and others have sought for so long.

The human brain processes information in three dimensions. (Did you know that the cochlea of the human ear, which is responsible for vestibular sensation, has canals in X, Y and Z planes?) That makes it difficult to entertain the notion that the universe may be composed of many more dimensions than what we easily perceive. *Hyperspace* by Michio Kaku covers parallel universes, time warps and all things multidimensional.

Rare Astronomy Book Collection for Sale

A former Yale University astronomer is selling his collection of rare astronomical books to raise money for a program that brings astronomy to kids in the inner city and disadvantaged rural areas. Professor Peter Wlasuk hopes to raise enough money to buy a van, pay for extrainsurance and acquire several telescopes. During his tenure at Yale, the former professor revised the *Yale Bright Star Catalogue* and co-authored its *Supplement* (both still available from Willmann-Bell). He indicated the collection contains "a goldmine of information for amateurs looking for things to research. The right person who acquired this library could do major research with it, and I even know of a couple grants that are waiting to be awarded to someone who'd be willing to undertake the research (one is awarded annually by the Dudley Observatory in Albany, NY)."

He is also offering limited edition reprints of two extremely rare atlases: Reverend Dawes' *Celestial Atlas* (1851), and Lohrmann's *Moon Atlas* (1824 and 1878). To purchase the entire library or for orders of reprints of the atlases, contact: Prof. Peter Wlasuk, FRAS, P.O. Box 8515, Naples, FL 34101-8515. Checks should be made out to "Starry Skies."

Crystal Cove State Beach Outreach Activity Report

by Mike Hughes, OCA Member

Several volunteers from OCA supported the Crystal Cove State Beach Park Astronomy Night on July 25. I don't know how the ranger did it, but the weather was great. Since I live near the beach I was expecting to see the usual fog and overcast begin to roll in. But it stayed clear, still, and almost warm all evening.

At sunset, while we were setting up our telescopes atop a hill with a great view of the Pacific Ocean, the park rangers were showing the gathered crowd (75 to 100 people of all ages) a stuffed great horned owl. Right on cue, a large bird flew directly overhead, which Head Ranger Michael Eaton thought must be a great horned owl. Actually, someone said it was just a raven. Before they even got to the stuffed coyote, we definitely heard a coyote howl, perhaps at the nearly full moon.

As soon as I carried everything up the hill from the parking lot, I set my 8-inch LX50 SCT on Venus. Right after sunset, well before dark, it was clearly visible as a thin crescent. At least a dozen people commented that it looked just like a miniature Moon and wanted to know if all the planets looked like that. I had to think fast and explain that only the planets inside Earth's orbit showed phases like the Moon. I also had to explain that the telescope reversed east and west therefore the crescent actually does open toward the setting sun even though it looked backwards.

A few minutes later, the ranger asked if anyone knew what the bright object in the west was. About 20 people, most of whom had just gazed at it, all yelled Venus, which really surprised the ranger. After the presentation, lines formed at all the OCA telescopes showing the Moon, Mars (getting rather small now), the Hercules cluster, the Ring Nebula in Lyra, and other astonishing things to people who have never seen the night sky through a telescope. Several people wondered why Mars looked red to the naked eye, but not nearly as red through a telescope. I tried to explain that our eyes are less sensitive to colored light than to black and white. But, after I asked several kids in a row what color they saw and they answered orange or red, I think maybe age could also be part of the explanation!

The reason that I enjoy volunteering for these OCA outreach events is the fun of sharing the enthusiasm of people seeing these objects for the first time, adults as well as kids, the questions they ask, and the seriousness with which they listen to the explanations.

Thanks to all OCA'ers who contribute to the Club's monthly newsletter! The Club is fortunate to include many talented members of all ages. Anyone who wants to contribute to the Sirius Astronomer may do so in the form of letters, photography, commentaries, articles, research and observing reports, and humor, just to cite a few examples.

The Sirius Astronomer is YOUR forum for the advancement of amateur astronomy. Contributions are accepted via email or on diskette. My email address is: *chrism31@gte.net*. Telephone: 714-840-1026.--
-Editor

Virtual Astronomy

by Dave Kodama

After a week of almost nonstop travel in Turkey, it's a relief to be back at home. Happily, I can report that I had my first successful eclipse expedition thanks to OCA member Joel Harris, his great group of regular eclipse-chasing veterans, and many friendly people in Turkey, though this was tempered by the knowledge that so many people were caught in that large earthquake near Istanbul.

As reported on the *Sky & Telescope* "Eclipse Journal" pages (<http://www.skypub.com/sights/eclipses/ee99home.html>) by OCA President Russ Sipe, most of the eclipse tour members had fortunately already left Turkey. However, there are a few individuals, including OCA members, who had been scheduled to do extended traveling in Turkey. As of this writing, I haven't heard anything from them, so let's hope for the best for them.

The eclipse experience itself is just as described by the veterans. I found it to be a surreal compression of time with so much happening – the sky rapidly darkening, temperature falling, Venus popping into view, shadow bands, and the sudden appearance of electric pink prominences against a brilliant white corona. All of this was further heightened by our location on a hill near the city of Elazig which had been especially prepared by the local government for eclipse watchers. Initially kept out of our area, the local people overwhelmed the police stationed to keep order, and so at eclipse time we were enveloped in a huge crowd of humanity---very friendly and well-behaved---and curious as much about the crazy eclipse visitors as the activity in the sky!

As soon as I got back home, I checked the internet for reports of how the eclipse had gone elsewhere, and found that it had been a disappointment in most of Europe due to bad weather. I suppose that explains the relatively few postings of reports and images, but here are a few I found:

http://www.nerdnet.nl/~angelo/phoenix/eclipse99/index-en.html	(France)
http://www.salzgeber.at/astro/eclipse99	(Germany)
http://www.unet.univie.ac.at/~a8800182/	(Austria)
http://www.drdaale.com/eclipses/solar.htm	(Hungary)
http://www.hszk.bme.hu/~os203/nap/en.html	(Hungary)
http://www.williams.edu/Astronomy/eclipse99/	(Romania)
http://www.comet-track.com/eclipse/secl99/secl99.html	(Turkey)
http://www.eanet.com/kodama/astro/990811/	(Turkey)

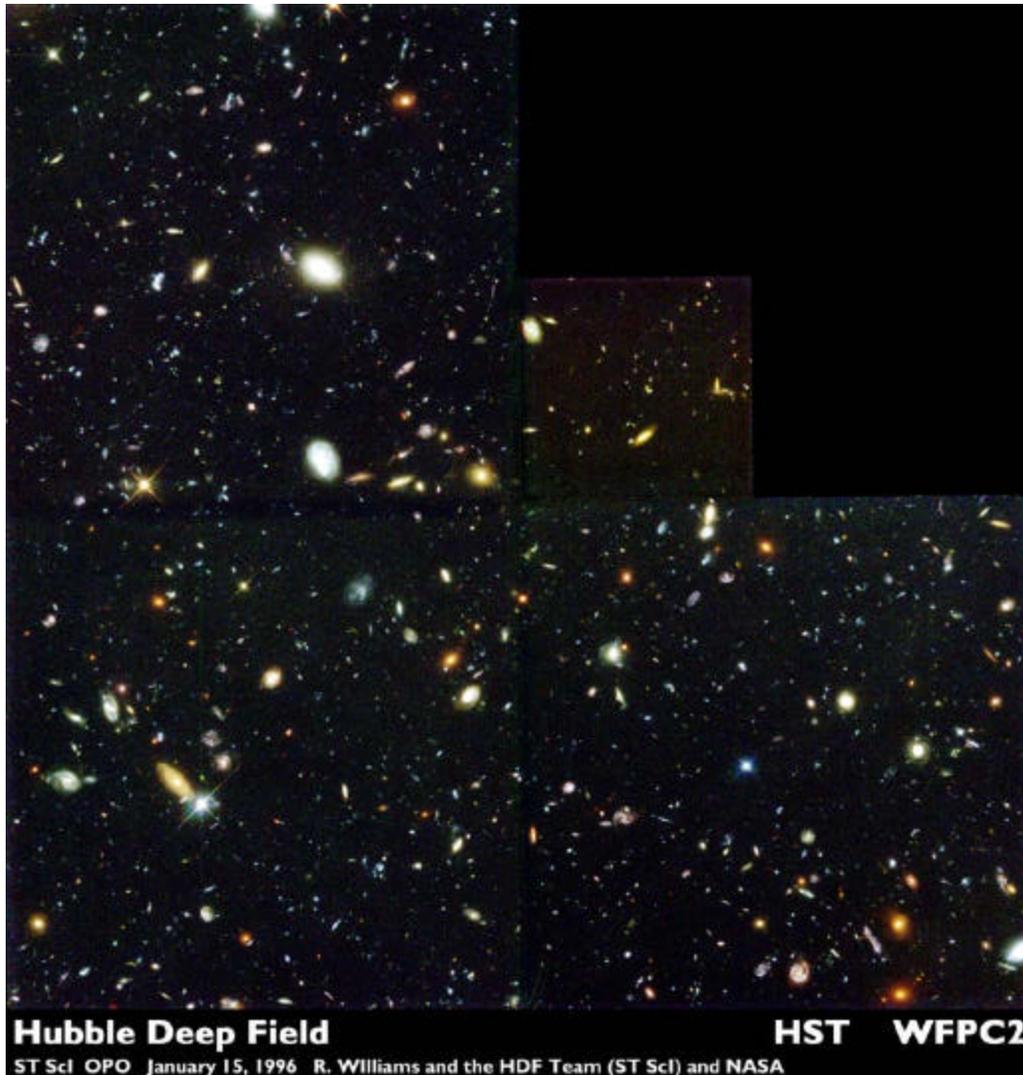
The last entry is my own first attempt at eclipse photography, which, although not without technical problems, turned out to exceed my expectations. I attribute my success to a lot of good advice I got from veteran photographers on the internet, as well as to Joel and the other experienced photographers in his group. Also very interesting are a pair of time-lapse sequences looking back at the earth. The images are standard weather satellite views taken as the eclipse progressed across Europe and the Middle East:

http://www.osei.noaa.gov/Events/Unique/Eclipse/UNIEcl223A_MT.avi
http://www.osei.noaa.gov/Events/Unique/Eclipse/UNIEcl223B_MT.avi

These are rather large AVI format video sequences, so download times may be quite long, and you will need an AVI plug-in for your browser to see them. In addition, the web "magazines" also had good coverage with numerous photos from all areas as well as video clips:

http://www.astronomynow.com/eclipse/	Astronomy Now
http://www.skypub.com/sights/eclipses/ee99home.html	Sky & Telescope
http://www.exploratorium.edu/eclipse/	The Exploratorium
http://www.newscientist.com/nsplus/insight/eclipse/eclipse.html	New Scientist
http://www.eclipsecast.com/	Science @ NASA

Keep your eye on the internet in the next few weeks. I'm sure more great images will be posted as eclipse travelers return home.



September's Featured Speaker



Dr. Gary Peterson, Professor of Geology
San Diego State University, San Diego, CA and
Fellow, The Geological Society of America

Planetary geologist Gary Peterson returns to the OCA following his popular March talk on "Basaltic Flooding of Planetary Landscapes." His talk this month is entitled: "Collisions of Comets and Planets." His scientific work involves study in the emerging field of planetary geology, which he describes as "viewing the solar system through a different filter."

On the current topic, he writes: "Comets occupy large elliptical orbits carrying them from the Oort Cloud into the inner Solar System, where they potentially may collide with planets. When impacts occur, the comet content is transferred to the planet. If the planet is large enough, the added water and gases remain and profoundly influence the evolution of that body. Examples for the Moon and all Inner Planets are cited, plus the Shoemaker-Levy 9 impact on Jupiter." To find out more about Gary, visit his website at <http://www.rohan.sdsu.edu/~3gleep6/planets.html> .

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.)

SOHO (Solar and Heliospheric Observatory) - is still on track for encounters with the moon Io in October and November. Io is the one large moon that Galileo has not examined closely yet, though it takes distant Io observations often. The reason for this is that the radiation close to Io is strong enough to possibly damage the spacecraft. On August 12, Galileo met and survived the strongest dose of radiation it has experienced since its closest approach to Jupiter the day in 1995 that it went into orbit about that planet. It is thought that a volcanic outburst, passage through the plasma sheet (a disk of charged particles about the planet), and proximity to Jupiter contributed to the radiation. Galileo did experience 4 temporary failures during the radiation exposure, but onboard software reset the spacecraft with only a little loss in taking data. The radiation dose experienced is stronger than what is expected in the coming Io encounters, so it speaks well of the spacecraft's ability to survive them. Galileo studies of the aurora (like Earth's Northern Lights) at Jupiter's moon Io, made during eclipses to eliminate sunlight from the observations, show that an astronaut landing on Io would be rewarded with the most dazzling auroral show in the solar system. Io's aurorae are caused by the impact of electrons on atmospheric gasses. Io is bathed by a swarm of charged particles that are trapped by Jupiter's magnetic field. In addition, a powerful electric current flows from Io to the poles of Jupiter, caused by an enormous electrical potential of 400,000 volts generated by the motion of the Jovian magnetic field past Io. When these electrons collide with the gasses in Io's atmosphere, they set off a light show of red, green and blue emissions bright enough to be visible to the naked eye. The red and green glows may be caused neutral oxygen and sodium atoms, respectively. The bright blue emissions are probably due to sulfur dioxide vented from volcanoes on Io. Io's eerie glow dims noticeably with time as the moon lingers in Jupiter's shadow during an eclipse. The likely explanation is a partial collapse of the moon's atmosphere during eclipse. Some of Io's patchy atmosphere is derived from sulfur dioxide ice on the surface of the moon that is warmed by the Sun and sublimates (evaporates). This component probably begins to recondense in the absence of sunlight during eclipse. More surprisingly, the blue glows appear to intensify while Io is in darkness. This may indicate that some of the current flow between Io and Jupiter is conducted through the interior of Io, particularly during periods when the atmospheric conductivity is low.

Deep Space 1 (asteroid, comet and technology test mission) - flew within about 16 miles of asteroid 9969 Braille, at a speed of 35,000 mph, late the night of July 28. The spacecraft's infrared sensor confirmed that the small asteroid is similar to Vesta, a rare type of asteroid and one of the largest bodies in the main asteroid belt. Scientists are now wrestling with a thorny question: Is the near-Earth asteroid Braille a chip off Vesta's old block, or are the 2 asteroids siblings which originated elsewhere, perhaps thrown off a larger body? Braille's longest side is now estimated at 1.3 miles and its shortest side about 0.6 miles. This elongated asteroid was expected to be irregular, and 2 photographs taken about 15 minutes after the encounter have helped to confirm this. Infrared spectra and measurements of electrons and ions were also taken near the flyby. Deep Space 1 has 12 new technologies on board, and all of them except the autonomous navigation system (AutoNav) had been completely tested before this flyby. With the encounter, AutoNav completed testing. AutoNav takes images of stars and asteroids to keep track of its location in space and to guide trajectory changes. Formerly the process of calculating position and trajectory changes was done on Earth, and results radioed to spacecraft. Another technology tested by Deep Space 1 was the ion engine, which has operated about 1800 hours, far more than the nominally planned 200 hours. For these technology validation missions, designed to prove new and risky space technologies without endangering expensive missions, the science returned is considered a bonus. Asteroid Braille, previously known as 1992 KD, was named after the blind French educator Louis Braille, as a result of a contest by the Planetary Society to find an appropriate name.

Mars Global Surveyor - has produced images that show the red planet has changed dramatically in the 2 years since the spacecraft arrived. Mars is a world constantly reshaped by shifting sand dunes, monster dust devils, wind storms, frosts, and growing and retreating seasonally of the ice caps. As the seasons change to northern fall on Mars, storm clouds have been brewing over the north polar ice cap, clouds are covering much of the northern plains, and snow should begin to fall on the ice cap. Dust devils, swirling clouds of dust as high as 5 miles and weighing several tons, have been observed in northern Amazonis Planitia. Dust devils appear common, and were seen by the Viking spacecraft in the 1970s. As I write this, NASA scientists are scrutinizing images from Mars Global Surveyor to choose the precise landing point for the Mars Polar Lander somewhere near the south polar cap. Mars Polar Lander will land December 3, as will its piggybacked Deep Space 2 probes, which will smash into the surface to bury themselves and analyze underground soil samples.

Cassini (Saturn Mission) - successfully performed a flyby of Earth for its gravity slingshot effect on August 17 at an altitude of about 725 miles. The spacecraft has already made two such passes by Venus, and only the one with Jupiter (December 2000) remains before finally arriving at Saturn (July 2004), where it will go into orbit. There Cassini will explore Saturn, its largest moon Titan, and the other moons, rings, and magnetosphere. The gravity slingshots combined produce the effect equivalent to 75 tons of rocket fuel, more than any existing rocket could lift into space. It seems contrary to logic that the easiest way to reach the outer planets is to aim first at Venus, an inner planet. There was some controversy over the danger of placing plutonium (the electric power source for Cassini) on the spacecraft, particularly when it was coming so close to the Earth. A fact-filled article on this controversy was in the August issue of Astronomy magazine. Cassini was the last of the multi-billion dollar planetary spacecraft, barely surviving the NASA budget cuts a few years ago. However, with advancing technology, the far cheaper missions since, such as Mars Pathfinder, are still producing spectacular results.

Chandra (X-ray observatory) - launched from the Space Shuttle soon after this column went to press last month. It has up to 100 times better resolution than previous X-ray telescopes. There are already 800 observing proposals submitted, with targets including black holes, exploding stars, hot gas, and newborn stars.

LINEAR (Lincoln Near Earth Asteroid Research) - a project of MIT's Lincoln Labs, has made 250,000 asteroid observations, of which 228 are Near-Earth Objects newly discovered. These are more detections than any other source. The project uses technology originally developed for the surveillance of Earth-orbiting satellites.

BESS (balloon-borne cosmic ray detector) - was launched by NASA and Japan on August 11 for its 6th balloon flight to the edge of space to study cosmic rays and antimatter. It detected hundreds of antiprotons, but still no anti-helium. Unlike antiprotons, anti-helium is virtually impossible to create by collision of regular matter, and so would be evidence that substantial antimatter remains from the big bang. With continuing improvement of the BESS instruments, scientists hope to detect anti-helium, if it exists, on future flights.

Torino Scale - Planetary scientists have developed a new means of conveying the risks associated with asteroids and comets that might collide with the Earth. The scale, similar to the Richter scale for earthquakes, will assign values to celestial objects moving near Earth. The scale runs from zero to 10, with zero meaning virtually no chance of causing damage on Earth, and 10 meaning certain global climatic catastrophe. The scale is named the Torino Impact Hazard Scale after the Italian city where the scale was adopted by the International Astronomical Union (IAU). No asteroid identified to date has ever had a value greater than one. An asteroid bigger than a mile across might hit once every 100,000 to one million years on average. On the other hand, tiny meteorite fragments as big as grains of sand bombard Earth constantly, and objects the size of a small car hit a few times a year.

Contour (COMet Nucleus TOUR) - NASA has signed up famed Harvard comet astronomer Fred Whipple as a member of the science team for the Contour spacecraft, due to be launched in 2002. The mission will take images and comparative spectral maps of cometary nuclei and analyze the dust and gas flowing from Comets Encke, Schwassmann-Wachmann 3, and d'Arrest. Whipple at age 92 is the oldest active researcher for NASA. James Van Allen, discoverer of the Van Allen radiation belts, had been the oldest when he worked on Galileo at age 83. Whipple says he plans to participate in all science team meetings. During his long career, Whipple discovered many comets, wrote the papers first describing how comet heads and tails form, coined the term "dirty snowball" to describe comets, headed the Smithsonian Astrophysical Observatory, had an observatory in Arizona named for him, and hired Carl Sagan for his first astronomy job.

Perseids Live! (balloon-borne meteor mission) - was launched to the edge of space during the Perseid meteor shower on August 12 to image meteors and sample meteor dust. The images were carried live on a web site. Several materials are being tested on this flight to capture meteor dust. A similar payload was sent up during the Leonids last November.

Diamonds (the sparkly things on engagement rings) - Geoscientist Stephen Haggerty says that dating of carbon in some diamonds shows that the carbon is much older than the volcanoes that spewed them out and older than any organic matter from life on Earth. Also the carbon isotopes in diamonds resemble that in meteorites. Thus some diamonds must have formed with the planets or arrived here in meteorites. In either case, the carbon would have come to the Earth or meteoroids from a supernova, where most elements heavier than hydrogen and helium were formed. This contradicts the currently held theory that diamonds formed deep in the Earth from heat and pressure acting on carbon-containing organic material that had been subducted deep below the surface.

IMPORTANT NOTICES

Dues Renewal

The month and year shown at the bottom of the address label indicates when your OCA membership is due for renewal. OCA dues may be paid at the meeting or by mailing your remittance, made out to "Orange County Astronomers" to Charlie Oostdyk, PO Box 1762, Costa Mesa, CA 92628. Your cancelled check will serve as your receipt. Dues are \$35 annually for general members. Full-time students, retirees, charter members and those under 16 are \$20 annually. Additional family members can be added to a membership for \$5 annually.

Address changes, missing newsletters and similar problems should be directed to **Charlie Oostdyk at (714) 751-5381, PO Box 1762, Costa Mesa, CA 92628.**

Magazine Subscriptions

Subscriptions to the astronomy magazines are now due for renewal, if you subscribed for one year or would like to subscribe at the club rate. You may also extend an existing subscription that does not end in December for one year at the club rate. We need at least five people per magazine. Bring your check made out to the OCA to the meeting or mail it to:

Charlie Oostdyk, Orange County Astronomers, PO Box 1762, Costa Mesa, CA 92628. Checks made out to the magazine publishers cannot be processed and will be returned to you.

If you already subscribe, please provide the mailing label or the billing invoice with your check. One year rates are as follows:

	Club Rate	Regular Rate
Sky & Telescope.....	\$30.00	\$39.95
CCD Astronomy	No longer published	
ASTRONOMY.....	\$29.00	\$39.95
ODYSSEY.....	No longer published	
Telescope Making.....	No longer published	
Deep Sky	No longer published	

The **DEADLINE** for subscribing at the club rates will be **the October monthly meeting, October 8.**

Expiration notices will be sent by the publishers to all current club subscribers about November 1 even if you renew through the club. It takes the publishers a few weeks to process renewals.

ASTROLLANEOUS

7th Annual Nightfall, September 10 and 11, 1999

Sponsored by the Riverside Telescope Makers Conference, this dark sky observing session is held annually at the Palm Canyon Resort in Borrego Springs, CA. For more information, see the website at: <http://www.rtmc-inc.org>, or call (909) 948-2205.

The 3rd Annual Starry Nights Festival

will be held in Yucca Valley (near Joshua Tree National Monument on October 15 and 16, 1999. Sponsored by the Western Region of the Astronomical League, the star party features many exciting speakers and superb night-sky viewing. For more information, contact SNF Registrar Bob Gent at: 325 Cloudes Mill Drive, Alexandria, VA 22304-3080. E-mail: BobGent@aol.com

CLASSIFIEDS

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