

OCTOBER MEETING DATE HAS CHANGED! SEE BELOW FOR DETAILS



The Rosette Nebula, a fall and winter favorite in the constellation Monoceros, is seen here in this image by Jeff Malmrose. Jeff used a Takahashi FS-102 with a modified Canon XT to create this image on September 20, 2009

OCA CLUB MEETING

The free and open club meeting will be held Friday, October 16th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. This month, OCA's own Chris Butler will give a behind-the-scenes look at the production of Griffith Observatory's planetarium shows.

NEXT MEETING: November 13th

STAR PARTIES

The Black Star Canyon site will be open on October 10th. The Anza site will be open on October 17th. Members are encouraged to check the website calendar, for the latest updates on star parties and other events.

Please check the website calendar for the outreach events this month! Volunteers are always welcome!

You are also reminded to check the web site frequently for updates to the calendar of events and other club news.

COMING UP

The next session of the Beginners Class will be held on Friday, October 2nd at the Centennial Heritage Museum at 3101 West Harvard Street in Santa Ana. The November class will be held November 2nd.

GOTO SIG: Oct. 8th

Astro-Imagers SIG: Oct. 20th, Nov. 17th

Remote Telescopes SIG: Oct. 28th, Nov. 25th

Astrophysics SIG: Oct. 23rd, Nov. 20th

Dark Sky Group: TBA

October 2009 President's Message

By Barbara Toy

Well, we're past the autumnal equinox and the start of the new school year and heading fast toward the holiday season and the winter solstice – the year does seem to have gone by fast in spite of all the problems we've seen in the news and in the lives of too many of our members all year. We keep hearing about signs that the economy is turning around, but there are still too many of us who are finding that times are getting tougher with any hope of improvement still far in the future. If you can give any encouragement to anyone you know in that situation, please do. And if you happen to be in that situation yourself – I hope things improve much faster for you than you fear, and that your interest in astronomy gives you some mental relief from whatever troubles you may be facing.

Turning to matters within the club...

OCA Election for the 2010 Board:

We start taking nominations for the 2010 Board at the October general meeting, so do get ready to throw your hat in the ring for a position on the Board! We know that one of our current Trustees won't be running next year, so there will be an empty position – why not fill that yourself? As I've said before, serving on the Board is a lot of fun as well as important to keeping the club healthy and running well.

As of the time I write this, the list of candidates for positions on the Board is:

President: Craig Bobchin

Vice President: Reza AmirArjomand

Secretary: Bob Buchheim

Treasurer: Charlie Oostdyke

Trustees: Gary Schones, Alan Smallbone, Shelia Cassidy, Steve Short, Kyle Coker, Barbara Toy

Craig Bobchin has been doing a great job as Vice President for the last five years, which may be a club record for consecutive terms in that position. I'm looking forward to seeing what he can do as President, and it will be very nice to have a fresh but experienced face in that position!

When he announced his willingness to run for Vice President, Reza AmirArjomand showed tremendous and welcome enthusiasm for that position – after seeing what he has been doing for our website as our current Webmaster and hearing his proposals for improvements and additions we could make to it since he took over that responsibility, I am really looking forward to seeing him in action as Vice President!

Almost every year it seems we face the sad loss of one or more valued members of the Board, and this time, after losing Sheryl Benedict to her new life in Tennessee, we are losing Tom Kucharski. He has served on the Board for eight years or so, as I recall, and has brought us a lot of experience from his work with his original club in New Jersey, which has been a valuable addition to our discussions and has provided us with some good ideas for our own club over the years. He has also enthusiastically involved himself in a variety of other club activities, including heading up the AstroImage SIG for a while, until the demands of his job created too many time conflicts for him. The Board will really miss him next year, but fortunately we know that he'll still be around and active in the club, as he has a stake in one of the observatories out at Anza and he's active with the AstroImager group, among other things. So this is – very fortunately – just a farewell as a Board member, not as a club member!

The OCA Outreach Group:

We mention "outreach" and the "outreach group" a lot around the club – they're featured in the club announcements every month, noted on the club calendar, announced on the email groups, and so on. To those of us who've been involved with this aspect of the club's activities, it's clear what is meant, but that may not be the case for all of you. So, this is my view of the our outreach program, offered in hopes that it will clear up any questions you might have about it (if I missed one, please email me and I'll be happy to give you more information), and that it will encourage you to join in this fundamental club activity.

When we talk about the outreach group, we're generally referring to Jim Benet's group of volunteers who do outreach events at various schools, parks and other venues. Jim schedules the events and actually makes it to most of them himself – as he has since becoming the Outreach Coordinator sometime before I joined the club in 1999 (though he's having to scale back now because of other obligations). The group's "meetings" are the outreach events themselves – one of the great pleasures of

doing these events is the chance to visit with the other volunteers, help each other out, and check out the equipment other volunteers bring to each event (particularly anything that's new or is being used in a new way).

The greatest pleasure of these events, though, and the heart of what we mean by "outreach," is sharing views of the night sky (and sometimes the sun, during daylight outreaches) with all kinds of people, most of whom have never had a chance to see these things for themselves before and are very grateful for the chance to look through your telescope and for any information you can give them about what they're looking at. We all delight in seeing children's faces light up when they connect with what they're seeing, but it's just as rewarding to see the pleasure and sense of discovery in faces of all ages and hear the excitement in their voices as they talk about what they're seeing.

Our winter outreaches are usually at different schools around Orange County, and are limited to students from the hosting school and their families (these are listed on our website calendar as "private" events, as the schools can't have them open to the general public because of liability issues). Even so, there can be 200 to 300 people at these events, enough to keep five or six telescopes very busy indeed – the more volunteers we can muster for the larger events the better. Outreaches at parks, libraries, the Mary Muth Nature Center, and similar locations *are* open to the general public, and usually also attract pretty big crowds.

The main part of these events is volunteers bringing their telescopes or other viewing equipment for people to look through. Sometimes there'll be a presentation of some kind to kick things off – evenings at the Mary Muth Center start with a presentation inside the center, followed by viewing outside, for instance, and some of the other events start with Jim, Steve Short or someone else pointing out some of the naked-eye objects that are visible in the sky, talking about particular items of interest that we might be viewing, or getting people primed to spot an Iridium Flare or something like the space station passing overhead – but often the volunteers just set up and start dealing with the people who are showing up to view without any initial presentation.

The best way to get involved with this group is to email Jim Benet (jimbenet@pacbell.net) and ask to be put on his mailing list, though he puts all of the information about scheduled outreaches on the OCA website calendar, as well, including directions on how to get to the different events. He sends out regular reminders about upcoming outreaches, and which ones he needs more volunteers for – choose one or more that are convenient for you and let Jim know you plan to be there, take your scope or other viewing equipment out there, set up (this is when there's usually a lot of visiting between the volunteers) and prepare to have a busy, fun and satisfying evening.

If you have any questions about particular events or the outreach program in general, Jim is the best person to contact. If you want to check out what happens at these events before bringing out any of your equipment, it's best to show up before the event is scheduled to start so you have a chance to talk to the volunteers as they are setting up and see how they organize things – and they often can use a bit of help, if you can provide it.

There should be an article in this edition of the Sirius Astronomer from Jim Benet, giving some statistics and other information on the program. Most of the schools where we have done these programs become repeat customers, so to speak – they want us back every year because their students and the students' families all learn a lot at these events and enjoy them so much. Most of my own outreach activities now are working with the Kuhn or with the Beginners Astronomy Class, but when I was a regular with Jim's program, I would often talk to students who were in one of the classes that hosted us at their school one year and made it a point to come back in later years so they could look through the telescopes again even though they were no longer in a related class, because they were so thrilled with their first experience. There aren't many ways you can have that kind of positive impact on a kid in an interaction of just a few minutes, but doing outreach gives you that chance – I hope you'll try some volunteering for the program and see for yourself what a fun and inspiring experience it can be!

OCA Field Trips

You may recall that I mentioned in a past President's Message that I'd heard that there had been several club field trips in the past, but I didn't know many details. Don Lynn has since kindly filled me in on the past club field trips he recalled. I didn't take notes, unfortunately, but among the trips he told me about I recall trips to Table Mountain and Stony Ridge, as well as Palomar and Mt. Wilson, all in the Southern California area, and also Kitt Peak.

Kitt Peak is near Tucson, Arizona, and planning a field trip there would be a difficult proposition, but club field trips to Palomar or Mt. Wilson could be done again fairly easily. We happen to have several members who are docents at Palomar (Tom Kucharski and Mike Bertin come to mind, and I'm sure there are others), which would certainly make it easier to arrange a tour for an OCA group. As we found with the Palomar tour we had in conjunction with AI 2006, the exact details of what the tour

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The Galileoscope In Action

Tom Koonce

When I first heard about the Galileoscope project which seeks to get a 'good' telescope into people's hands for \$20, I was, to say the least, a bit dubious about their claims. I wasn't expecting much, but for \$20 and an acknowledged addiction to telescopes, I took a chance and ordered one from their website: <https://www.galileoscope.org/gs/>

The Galileoscope™: An IYA2009 Cornerstone Project

The Galileoscope™ is a high-quality, low-cost telescope kit developed for the International Year of Astronomy 2009 by a team of leading astronomers, optical engineers, and science educators. No matter where you live, with this easy-to-assemble, 50-mm (2-inch) diameter, 25- to 50-power achromatic refractor, you can see the celestial wonders that Galileo Galilei first glimpsed 400 years ago and that still delight stargazers today. These include lunar craters and mountains, four moons circling Jupiter, the phases of Venus, Saturn's rings, and countless stars invisible to the unaided eye. The Galileoscope costs just US\$20 each plus shipping for 1 to 99 units.

The Galileoscope is more than a telescope – it's a strategic initiative to improve math, science, and technology literacy worldwide. With this easy-to-assemble kit, anyone can explore how optics work and then go outside at night to see the celestial wonders first glimpsed by Galileo 400 years ago!



Production and distribution are managed by Galileoscope, LLC, a new company established by the Galileoscope project team with the express purpose of ensuring delivery of the best possible product at the lowest possible price.

Sounds great right? But we all know that "talk is cheap." Well, I am now a believer in this product! I ordered my Galileoscope in early March and didn't receive delivery until mid July. But as I said, I wasn't expecting much for my \$20, and the delay turned out to be caused by the sheer number of orders they had.

The telescope arrived in kit form, and thanks to outstanding online directions, it only took 30 minutes from the box to mounting the completed two inch refractor, with two 1 ¼ inch eyepieces being mounted onto my existing photo tripod! It went together easily and probably would for ages 8 and up with adult supervision and for ages 12 and up, building it by themselves. Also, despite the name, the telescope is NOT a model of Galileo's telescope. He would have loved to have an instrument of this quality and capability!

You have to supply your own mount for the scope, but the scope has a standard tripod mount thread on it and the instructions describe how to make a poor-man's cardboard box mount that would work fine. I mounted mine on an inexpensive photo tripod I already had.

The two inch, two element objective lens produces well color-corrected imagery of the Moon and Venus, and the eyepieces produce 18X and 25X images when used individually or by combing these into a Barlow arrangement, you can get up to 50X. I have left it at 25X. First light for the scope was a daylight terrestrial object, the top of a power pole located 1 mile from my house that I frequently use to sight in telescopes and finder scopes. I'm glad I did this during the day because I was able to get familiar with the drawtube focusing of the Galileoscope and get focus set close to infinity before I used it later that night. The daylight images of the mountains were very sharp, but I was trying to not be too anxious in case the night-time views were less spectacular. The first object I looked at later in the evening was the gibbous Moon. Wow! It was tack sharp and I could see all details which I wasn't expecting to see for a \$15 dollar telescope. I could also see subtle shade differences and crater details that made me smile. I remembered the views through my very first Tasco two inch refractor with its "75X Zoom" eyepiece that had to cost \$50 in the 1960's. You probably had similar experiences with fuzzy imagery and chromatic aberration that made looking at the Moon poorly surreal experience. The Galileoscope is a breath of fresh air.

What can be seen? After studying the Moon with both eyepieces, I decided I liked the 25X view better, made sure the focus was still sharp before I pointed it at Jupiter, about thirty degrees above the eastern horizon. The very first thing I noticed about Jupiter were the four sharply focused moons, one just emerging from behind the planet. I guess I wasn't expecting to even see the Moons very well, not the two primary and one set of secondary bands on the planet. But there they were! I can imagine the inspiration that the Galileoscope will provide youngsters around the world. I observed the beautiful gold and blue double star Albireo at the head of Cygnus next. Great color, nice view. The globular cluster M13 was a nice fuzz ball and I could tell it was a globular and not a comet. The next morning I got up at 4:30 am to point the scope at the Orion Nebula and was not disappointed. I resolved everything I expected a two inch telescope to reveal, and the contrast was pretty darn good! I had to kneel on the ground while looked nearly overhead at the nice view of the Andromeda Galaxy M31, (\$20 folks! This scope is sooo cool!), then I got the entire Pleiades cluster in the field of view. I saved Venus for last, since it is typically a big problem for inexpensive scopes because Venus appears small, white and very bright. I immediately noted two things. I was looking at a gibbous Venus and that I saw an afterimage from internal reflection between the front two elements and a faint afterimage reflection between the two elements of the eyepiece. The front reflection was a bit distracting, but not overwhelmingly so.

The Moon, major planets, the brighter deep sky objects – all for one twenty dollar bill. Better yet, buy one for yourself and in the spirit of the International Year of Astronomy 2009, buy a second scope for just \$12.50 to donate to someone around the world who otherwise would never get an opportunity to see the sky in such detail.

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would cover would most likely be subject to change depending on conditions and what was going on with the various facilities at the time of the tour, but there certainly is a reasonable possibility of getting in to see some “behind the scenes” parts of the Mountain. The same is probably true for Mt. Wilson, at least when things get back closer to normal there after the Station Fire.

Table Mountain is a JPL research facility near Wrightwood, and looks like a fascinating place to visit, but, per their website, they don't have a visitor center or any mechanism for giving tours. Any tour would have to be through one of the scientists doing work there, and would probably be limited to the area where that scientist is working. If anyone has any connections there, though, I expect that a lot of club members would be interested in seeing it.

Stony Ridge Observatory (SRO) is a large private observatory located near Mt. Wilson, with a 30-inch reflector telescope that was built as a professional-quality amateur facility – the project started in 1957, and saw first light in 1963. A tour could probably be arranged, though they don't mention that on their website. However, it is currently having the same access problems as Mt. Wilson, as both were seriously threatened by the Station Fire (still not entirely contained as I write this on September 20), though both have, very fortunately and due to a lot of hard work by firefighters, survived.

If anyone is interested in arranging a club tour of any of these or other local astronomical facilities, we welcome your efforts and assistance in setting it up.

Mt. Wilson and the Station Fire

Fortunately, both Mt. Wilson and Stony Ridge Observatory seem to have escaped serious damage from the Station Fire themselves, but it looks like it'll be a long time before the roads up there will be open to the public due to fire damage to the roads (particularly to guardrails and anything else that contained wood or melted in the high heat) and the instability of the slopes above the roads from the loss of vegetation and other effects of the fire. For more information about the effects of the fire and pictures of the devastation left behind it, see the Mt. Wilson website: <http://www.mtwilson.edu/>.

In spite of its historical importance and the fact that it remains a significant research facility, Mt. Wilson doesn't have a solid source of ongoing funding. A major part of the money that keeps it going comes from renting out nights on the 60-inch, as we have done in the past for club groups and hope to do in the future, as well. One of the effects of the Station Fire is that they not only lost the nights that had been rented out during the fire itself, but the condition of the road up there now is so bad that it is unlikely to be reopened to the public for a long time, possibly several months, which means that they have lost the revenues from those nights, as well. Compounding their problems, they now have a number of new expenses because of issues left by the fire or that they now know need to be addressed to make Mt. Wilson more defensible against fires in the future. For more details about all of this, please see their website.

They have posted an urgent appeal for donations to help them make up for the shortfall in their budget caused by the fire and to help pay for these additional expenses. I know times are hard for all of us, but Mt. Wilson is an important local astronomical asset and, if you can help them out at all, please do. Donations can be sent to: The Mount Wilson Institute, Fire Recovery Program, P.O. Box 1909, Atlanta, GA 30301-1909, or you can donate online from their website.



The Los Angeles Basin as seen from Mt. Wilson, May 8, 2009 (photographer unknown)

AstroSpace Update

October 2009

Gathered by Don Lynn from NASA and other sources

Stardust (comet sample return) – Scientists have discovered glycine, an amino acid and a fundamental building block of life, in samples of comet Wild 2 returned to Earth in 2006 by the Stardust spacecraft. Glycine was detected some time ago in both the aerogel sample collector and the foil liner about the aerogel, but the new analysis was the first to rule out the possibility that it was contamination from manufacture or handling of the spacecraft on Earth. Carbon that comes from space has a higher proportion of Carbon 13 than carbon from Earth. Carbon 13 is a variety (isotope) of the element that has an extra neutron. The new analysis showed the carbon in the glycine was space carbon.

Hinode (Japanese solar space telescope) – The mystery of why temperatures in the Sun's atmosphere far exceed those near its surface has finally been explained by tiny bursts of heat called nanoflares. The Sun's outer atmosphere, or corona, is made up of loops of hot gas that arch high above its surface. These loops contain magnetic strands that reach temperatures of millions of degrees, even though the surface registers only 5700° K. Hinode observations reveal the culprit as nonflares, small sudden bursts of energy that occur within magnetic tubes. It is believed that stresses in the magnetic field are released when thin sheets of electric current become unstable, and the result is a nanoflare. Theories of heating of the Sun's atmosphere other than by nanoflares are inconsistent with densities and temperatures measured by Hinode. The gas is heated by the nanoflares up to as much as 10 million degrees, and then quickly cools to about 1 million degrees. It then expands upward to populate the corona with the 1 million degree gas that has long been observed. Nanoflare activity was found to be prevalent across the Sun's active regions.

Galex (ultraviolet space telescope) – Astronomers have established the ratios of stars of various masses that are formed in star forming regions. For example, 2000 low-mass stars are formed for every very massive star. This relationship is called the stellar initial mass function. Observations have established that the ratios are nearly the same for all star-forming regions. This relation is often used to determine the number and masses of stars in regions so distant that only the brightest stars can be observed. New observations by Galex combined with filtered red images from a ground-based telescope in Chile show that many galaxies have plenty of lower mass stars even though few massive stars formed. This is especially true in small galaxies. The number of small stars estimated using the established methods resulted in numbers as small as ¼ of the actual numbers seen by the new observations.

Chandrayaan-1 (Indian lunar orbiter) on August 20 teamed up with the American Lunar Reconnaissance Orbiter to do bi-static radar observations of the crater Erlanger near the lunar north pole. Ice has a distinctive signature in this arrangement, where 2 receivers in different directions receive a single radar signal. For some time many astronomers have proposed that ice from comets should remain in the bottoms of craters near the Moon's poles, since sunlight never reaches those places. Unfortunately analysis of the data showed that Chandrayaan-1 was oriented incorrectly, so the radar beam missed the target. This was apparently the beginning of the end for the spacecraft. On August 29, all contact was lost with Chandrayaan-1. Analysis after the loss indicated that the spacecraft bus manager unit had failed, probably due to the high temperatures that the spacecraft had been experiencing for some time. Apparently the design of the spacecraft had not included enough insulation to protect it from sunlight, both direct and reflected. It had completed about 95% of its planned science when the mission ended. The spacecraft remains in low orbit about the Moon, but without control the orbit is expected to decay and hit the surface in about 1000 days. Undaunted, the Indian space agency (ISRO) is charging ahead with developing Chandrayaan-2, which will land a rover on the Moon.

Lunar Reconnaissance Orbiter (LRO) has imaged the landing area of the Apollo 14 mission with great resolution. The tracks left by the astronauts and their MET equipment cart can be seen. The 2nd trek by Shepard and Mitchell had been planned to go to the rim of nearby Cone Crater, but mission control advised them to return before reaching the crater, when time and oxygen were running shorter than planned. No one ever knew how close they made it. The astronauts found it was difficult to judge distances and the rolling terrain was filled with similar-looking ridges, so crater rims and other landmarks on maps could not be distinguished. This trek was the first one where astronauts traveled out of sight of their lunar module. The new LRO image shows their tracks ending only about 100 feet from the rim of Cone Crater.

LCROSS (lunar impact mission) experienced an anomaly in which the Inertial Reference Unit failed. The spacecraft automatically started orienting itself using its star tracker instead. Unfortunately this mode burns up fuel prodigiously. Fortunately the craft was returned to normal operations with enough fuel remaining to complete its mission. The booster rocket from LCROSS will impact a crater near the Moon's pole on October 9 at 4:30 am PDT, in hopes of splashing up water that can be detected by the spacecraft itself as it flies through the plume a few minutes afterward. The spacecraft will also crash, after radioing its data back to Earth. Cabeus A was selected as the target crater after NASA reviewed images from LRO and other lunar missions. The criteria for selection included permanently shadowed from sunlight, high hydrogen levels detected, flat crater floor free of large boulders, and good visibility of the plume from LCROSS, LRO and Earth-based observatories (principally in Hawaii and Arizona).

Titan (Saturn moon) – Analysis of Titan data shows fog forming and dissipating. The fog is methane, not water fog that we are used to on Earth. In order for fog to form, the (methane) humidity must be high, and for that to happen, liquid methane has to be evaporating. The fog has been observed over much of the south polar areas, not just where lakes of methane have been found. This may mean that pools of methane, too small to be imaged, exist over much of the polar area. Likely the (methane) rainy season in the south is just ending.

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OCA Outreach

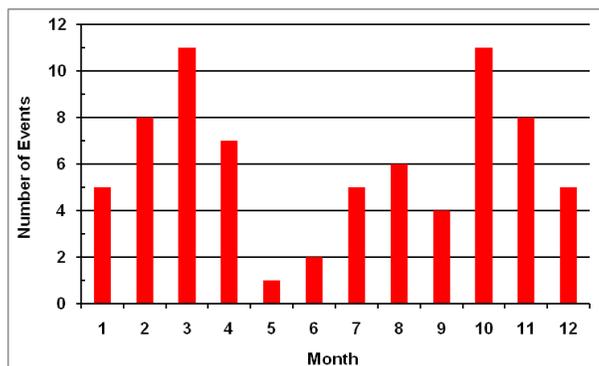
by Jim Benet

Over the years the OCA Outreach program has grown dramatically as shown by the graph above. This year will set a new record – by the end of September we will have conducted 49 events, and there are another 24 events scheduled to go before the end of the year. That will bring the total number of Outreach programs to 73 for the year, which is the largest number of programs that we have ever done. Next year promises to be even bigger, as we already have 38 events scheduled.

I want to thank the 42 club members who participated in these programs. Their names and the number of Outreach programs attended are shown in the text box at the end of the article.

The tremendous growth of the Outreach program has demonstrated that there is a great demand for science activities, astronomy in particular, in our area. The timing of most outreach events seems to correlate with the school year. Over half of our events are conducted in four months: October, November, February and March.

The Outreach program provides a very special service to our community and it is an opportunity for us to introduce more people to the wonder, beauty, and enjoyment of the stars. By sharing the night sky, we are creating the next generation of amateur astronomers, enticing students (teachers and parents, also) to learn more about science, educating them about light pollution, and (hopefully) encouraging them to protect our celestial heritage. We are always in need of additional volunteers to help us conduct these Outreach programs. Here's what you need:



- Your telescope that you can bring to the event location (usually a school or park). Telescopes ranging from 4-inch ETX's to 16-inch Dobs have all been used successfully at Outreach events, so yours is probably just fine.
- Your enthusiasm and knowledge – however great or limited that might be! You don't need a PhD in order to show someone the craters on the Moon, or clouds on Jupiter, or a cluster of stars. Help the guest focus, observe, and (maybe) tell them a little about what they're seeing.
- Your ability to find one object – preferably reasonably bright and "showy" (Moon or a bright planet, a star cluster or nebula, a double star). For most Outreach events, each telescope is pointed at a different object and guests go from 'scope to 'scope. That way, you don't have to continually re-aim your telescope.

If you can help out, even just once or twice a year, please send me an email (jimbenet@pacbell.net) and I will put your name on the Outreach notification list. Once a month, you'll receive a schedule for the upcoming Outreach events. If you see an Outreach program near your home or work that you would like to do, just reply to the email. Arrive at the location one hour before the start time. That will give you plenty of time to set up and align your telescope. Then pick an object you would like to show in your scope. If you can say a few words about what you are looking at, that makes it even better. Don't forget that your mileage to and from these events is tax-deductible (confirm with your accountant).

It is a thrilling experience to hear some fourth grader look through a telescope for first time and yell out, "I see Jupiter" as a giant smile comes over his face. Ask any of the regular Outreach participants about their experiences – you'll hear how fun and heartwarming it can be to participate. For just a little effort, you can make a big difference in some young person's life. Thanks for helping out. — JB

SPECIAL THANKS TO OUR OUTREACH VOLUNTEERS!

Jim Benet (41), Tom Drouet (30), Paul Kreitz (26), Dan Hoolihan (18), Sarah Hoolihan (16), Vittal Badithe (15), Maury Bennett (14), Diane Mason (13), Steve Short (13), Craig Bobchin (9), Ipei Tanaka (8), Sheryl Benedict (6), Harvey Carr (5), Jim Fitz (5), Val Akins (4), Dave Baker (4), Frank Bernal (4), Bill Gabris (4), Attilio Giolli (4), Rich Nowicki (4), Reza Amir Arjomand (3), Joe Ewach (3), Jamie Flores (3), Keith Hoffman (3), Donald Lynn (3), Todd Smith (3), Richard Stember (3), John Wohlfheil (3), Chris Buchen (2), John Hoot (2), Dan Iler (2), Donald McClelland (2), Doug Acrea (1), Bob Buchheim (1), Sam Fahmie (1), Arnie Grimm (1), Scott Holland (1), Tom Kucharski (1), Dennis Moonitz (1), Christopher Page (1), Bob Shanta (1) and John Thomas (1).

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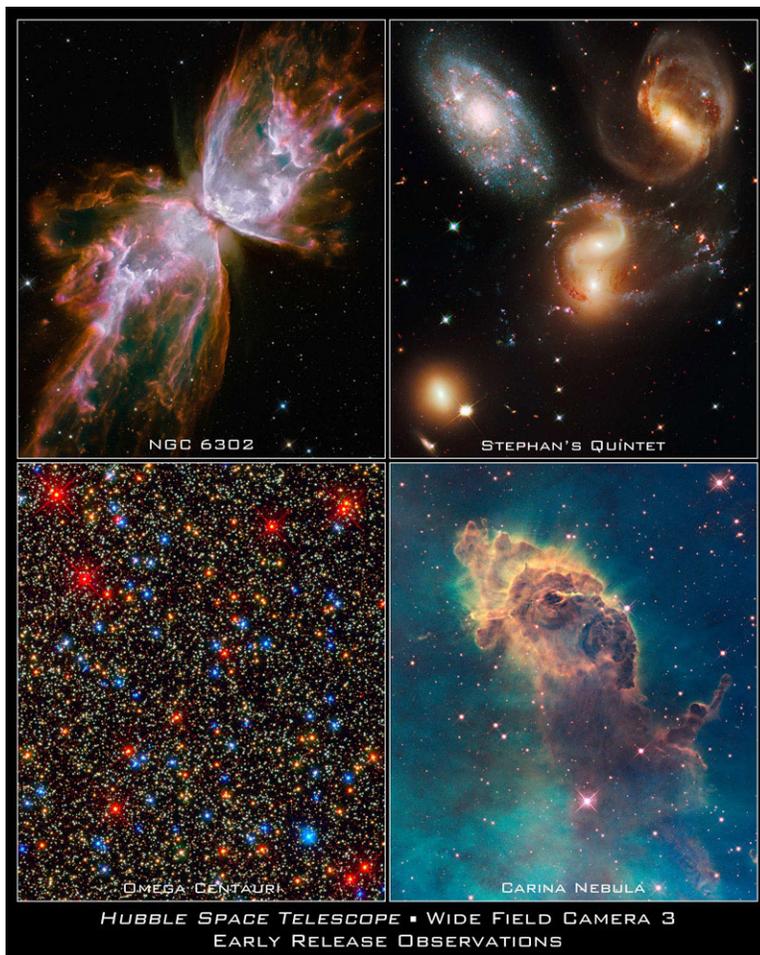
Saturn radiation belt was found to form and then dissipate after a few weeks, 3 times in 2005. It was near the orbit of the moon Dione. This was discovered in analyzing Cassini spacecraft data from a charged particle instrument. Due to the timing, it appears that the belt formation was caused by solar storm activity. The temporary nature of the belt was a surprise, since it was previously known that the permanent radiation belts closer to the planet are not affected by solar activity. This is apparently because the magnetic field prevents solar wind from penetrating that far.

Relativity – Scientists using the Very Long Baseline Array of radiotelescopes has measured the bending of (radio) light by gravity as it passes the Sun to great accuracy. A parameter called gamma expresses the warping of space by gravity, and is exactly 1 in Einstein's General Relativity, but slightly different values in other competing theories. The new measurement shows gamma to be 0.9998, within plus or minus 0.0003, supporting Relativity. Further work along these lines is expected to get a result 4 times more accurate.

Mars Reconnaissance Orbiter (MRO) – After analyzing the safe-mode events that MRO has experienced this year, the controller team has found a vulnerability to 2 safe modes if they would happen in quick succession. They are reprogramming MRO to avoid this possibility. But while this is happening, the spacecraft is being left in safe mode, and no science is being performed. The team expects to resume science when reprogramming is complete.

XMM-Newton (orbiting X-ray telescope) has found a white dwarf star orbiting another star, and the dwarf is getting close to becoming a Type Ia supernova. Close could be a few million years however. When it does explode, it will be as bright as the full Moon. The object was seen in X-rays in 1997, but was not identified as a high-mass white dwarf until recent observations. The mass was found from observing its orbit. It rotates every 13 seconds, the fastest known for a white dwarf.

Star formation – A new study of star forming regions using observations in polarized light shows that magnetic fields dominate over turbulence. Magnetic fields, as indicated by the polarization, tended to align with fields in surrounding space. More dominant turbulence would have churned up the magnetic field directions. This may settle a long debate over whether magnetic fields or turbulence is the primary factor that prevents much material from collapsing under gravity into stars during star formation.



Hubble Space Telescope (HST) – The first science images have been released since the refurbishment of HST by astronauts this past May. HST now has the widest capability it ever has in terms of wavelength (ultraviolet, visible, and infrared), sensitivity and resolution. The images released included NGC 6302 (the Bug or Butterfly Nebula), Stephan's Quintet (4 colliding galaxies and 1 not), the core of the largest globular cluster (Omega Centauri), a pillar of star birth in the Carina Nebula in both visible and infrared, galaxy NGC 6217, supernova remnant N132D, and gravitational lensing in galaxy cluster Abell 370. Comparison of the new images to previous HST images made with its older instruments easily showed the telescope's improved capabilities. Spectra of galaxy Markarian 817 and a distant quasar were also released. The spectrum of the galaxy showed changes that have occurred in the past several years due to movement of matter near the active core. The spectrum of the quasar showed lines imposed by many gas clouds that the light passed through on its way to us. Future plans for the more capable HST include a deep-field image in infrared.

Inflatable reentry vehicle – NASA tested for the first time ever an inflatable device designed to slow a spacecraft entering an atmosphere down to the speeds where parachutes or landing rockets are practical. Normally a heat shield performs this task. Because the inflatable device does a better job of slowing a spacecraft, its use could open up areas of Mars to landing spacecraft where it has not been possible before. The highlands of Mars simply don't have enough atmosphere above them for heat shields to do their job. The new device looks like a giant fabric mushroom when inflated. The test was done by using a sounding rocket to launch above Earth's atmosphere, then letting it drop back into the air at high speed.

Vaccine – The Astrogenetics company has applied to the FDA to do testing on humans of a vaccine against Salmonella infection. It was developed from experiments performed on Space Shuttle flights to the International Space Station (ISS). Near zero gravity

was necessary to determine certain characteristics of Salmonella bacteria that made the vaccine possible. That company and others have a number of requests to develop other vaccines and medications that require near zero gravity on future Shuttle and ISS missions.

Return to the Moon – Preliminary reports from the Augustine Commission state that current funding of NASA will not get us back to the Moon. The minimum required would be \$3 billion more per year, which would be about 17% increase. Even with that increase, the NASA budget would be considerably under 1% of the federal government budget. The report gave 8 options and variations that differed in funding, choice of heavy-lift rocket, and priority of the Moon among other manned exploration. It is up to the current administration to make a choice among these.

Instant AstroSpace Updates

Astronomers using a new camera on the Subaru Telescope in Hawaii have discovered the **most distant black hole** known, so far that its light took 12.8 billion years to reach us. It lies at the center of a large galaxy, and is estimated to have a mass a billion times that of our Sun.

Observations of M31 (the **Andromeda Galaxy**) show that stars in its outer fringes are leftovers from eating smaller galaxies.

Analysis of the orbit of Comet 147P/Kushida-Muramatsu determined that it was temporarily captured into orbiting Jupiter from 1949 to 1961, making 2 full turns about the planet. This is the 5th known **temporary capture** of an object by a planet.

The **Space Shuttle** Discovery launched at the end of August for a 13-day flight, carrying to ISS the Leonardo Module filled with supplies, science gear and parts. This flight marks the transition from assembling the space station to using it for continuous scientific research.

The next **Shuttle** mission, using Atlantis, is scheduled for the 2nd week in November, and its purpose is also to assemble and supply ISS.

Japan launched its 1st supply vehicle, called the **HTV**, to the ISS on September 10, carrying cargo in both pressurized and unpressurized sections. About 1 flight per year is planned for the next 7 years, taking most of the large material to ISS after the Shuttles are retired.

The 1st full-scale and full-duration test was successfully made of the **Ares I** 1st stage rocket motor. It is based on Shuttle solid rocket booster technology, in fact some Shuttle parts were re-used, but is somewhat larger and more powerful.

The search for the quietest air on Earth, and therefore the best place for astronomical observing, has located another spot in Antarctica, called **Ridge A**, with seeing 3 times better than the excellent sites in Hawaii and Chile. It is extremely high, dry, calm, and also remote.

Extensive computer simulations of **dwarf galaxies colliding** with large spiral galaxies shows that after many collisions the dwarf galaxy is torn apart, but the major galaxy suffers little damage other than the edge of the disk puffing up (outside edge is thicker than the rest of the disk). Until now, it has long been a mystery why the Milky Way's disk has a puffed edge. ■



Michael Mirjahangir obtained this photo of the International Space Station making a pass over Huntington Beach on July 28, 2009 using a Canon Digital Rebel XTi with a 50mm lens at f/6.3 and a 5-second exposure. The Moon can be seen through the cloud deck at the extreme right edge of the picture.

***Von Braun: Dreamer of Space, Engineer of War* by Michael J. Neufeld**

review by Bob Buchheim

Wernher von Braun had a remarkable life, overflowing with accomplishments and marked by stark contradictions. For a man whose passion was the dream of spaceflight, he was born at exactly the right time: he was a participant in the earliest days of European amateur rocketry, leader of the team that created the V2 (the world's first long-range ballistic missile), one of the prime movers behind America's first successful satellite, and arguably the father of both the Saturn rocket that carried the Apollo astronauts to the Moon and the public enthusiasm that funded the space program.

Many philosophers have wondered about the relationship between a man's accomplishments and his personal flaws, and the author of this biography is forthright about acknowledging the flaws and contradictions in von Braun's personality. He was a proud member of the pre-war German aristocracy, yet he happily learned the skills of a manufacturing laborer during his student years. He was remembered by many as a trustworthy and generous friend, yet he consciously turned a blind eye to brutality and slave labor at Peenemunde. He was a loyal and patriotic German, an officer in the Third Reich's SS, yet he enthusiastically embraced American liberty. He shook hands with Hitler and Speer, was arrested (and freed) by the Gestapo, met with Eisenhower, Kennedy, and Nixon, and was celebrated by Disney. He embraced Christianity and reached for the stars. He was, and did, all these things with passion, boundless energy, and a genius for managing projects and motivating people.

Michael Neufeld's book presents a well-written, fast-paced, meticulously-researched biography of the man who is still an icon of the Space Age and who was the prototype of the term "rocket-scientist" (although it is a term that he had misgivings about). It is well worth your while to read it! If you're about my age, it will bring back old memories: the dreams of a "great wheel" space station and manned missions to Mars, the real-life crackling radio signals from outer space ("Apollo, you are 'go' for lunar injection..."), and – in my case – the static display of a V-2 at the Redstone Arsenal (home of Marshall Space Flight Center). If you're younger, it's a fascinating journey through the era and the motivations that created the modern world of space flight.

We are on the verge of a long hiatus in US manned space flight (probably a five year gap between the decommissioning of the Space Shuttle and the maiden flight of Ares/Orion). The story of von Braun and the aftermath of Apollo is a reminder that we've bridged such a gap before, and it need not be an entirely negative situation. But we could sure use another person who combines the enthusiasm, salesmanship, and practical ability of Wernher von Braun!



Space Shuttle Discovery is shown piggybacked to its Boeing 747 transfer vehicle at NASA's Dryden Flight Research Center located at Edwards AFB, California in preparation for transfer back to Kennedy Space Center on September 18th. (Jorge Rubino)

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. 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:

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Sky & Telescope*	\$33.00	\$42.95
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***Sky & Telescope subscribers please note: Due to a change by the publisher, renewals of current subscriptions should now be made directly through Sky and Telescope! New subscriptions at the club rate must still be made through Orange County Astronomers and then renewed through the publisher.**

The **DEADLINE** for subscribing at the club rates will be the **October monthly meeting, October 16th**. The publishers will send expiration notices to all current club subscribers about November 1st even if you renew through the club. It takes the publishers a few weeks to process renewals.

For Sale: Celestron C6-R refractor on a CG-4 mount with 2 inch Antares diagonal, 2 inch 32mm wide field eyepiece, 9X50mm finder, 6" white light solar filter by Baader; Baader semi-apo filter for 1 1/4" eyepieces; 20mm Plossl eyepiece, counterweights and dustcap. All kept in good condition. \$450 Contact Val Akins at (949) 855-9018.

One of the more spectacular NGC objects, NGC 253 is a spiral galaxy in the constellation Sculptor approximately 11.4 million light-years from Earth. At magnitude 7.6 and a diameter of 30", it is observable even in smaller scopes and binoculars, though it is low in the sky from mid-northern latitudes. Bill Hall created this image using a 6-inch f/5 Newtonian and an ST-237A imager from our Anza site. Images created on 9/3/05 and 9/23/06 were composited to create the image seen here.



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