SIRIUS ASTRONOMER

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The Newsletter of the Orange County Astronomers

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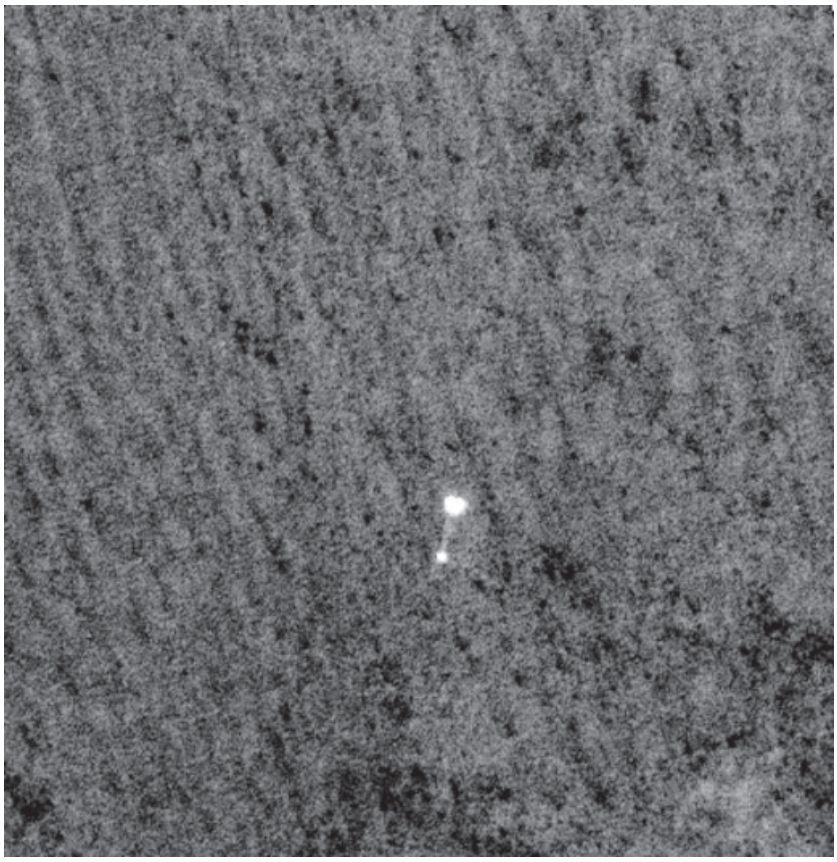
GOT MEAT? ANNUAL STARBECUE ON AUGUST 2ND!



NASA's Phoenix Mars Lander can be seen parachuting down to Mars, in this image captured by the High Resolution Imaging Science Experiment (HiRISE) camera on NASA's Mars Reconnaissance Orbiter. This is the first time that a spacecraft has imaged the final descent of another spacecraft onto a planetary body. (NASA/JPL-Caltech/University of Arizona)

OCA CLUB MEETING

The free and open club meeting will be held Friday, July 11th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. The main speaker is Dennis Mamana on a topic yet to be announced.

NEXT MEETING: August 8th

STAR PARTIES

The Black Star Canyon site will be open on July 26th. The Anza site will be open on July 5th. 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, August 1st at the Centennial Heritage Museum at 3101 West Harvard Street in Santa Ana.
GOTO SIG: TBA (contact coordinator for details)
Astro-Imagers SIG: July 15th, Aug. 19th
EOA SIG: July 23rd, Aug. 27th
Astrophysics SIG: July 18th, Aug. 15
Dark Sky Group: TBA (contact coordinator for details)

President's Message

By Barbara Toy

Now that we're past the summer solstice, the nights are starting to get longer again, which is good for those of us who enjoy the summer sky – it's unnerving not to have full darkness until sometime after 9:30 at night (even if that would only be 8:30 if it weren't for Daylight Savings Time). Of course, the further north you go the longer the twilight lasts and the shorter the period of full darkness during the summer, which I guess is a reminder that we should appreciate what we have. Though I have to admit, when I notice the details of a delightful dim fuzzy fading out because the dawn twilight comes so early at this time of year, gratitude that the night isn't even shorter isn't usually my predominant emotion…

Another "Unusual" RTMC...

Since I didn't make it out to RTMC on Friday this year, I can't claim any direct experience with the weather that was the main topic of conversation for the weekend. When I arrived late Saturday morning, I found that it was cloudy with the sun breaking through periodically, reasonably calm wind-wise and cold. There was snow on the ground in areas that were still in shadow as evidence of what I had missed, and everyone who had been there had a story of how they had weathered the snow, etc., that moved through the area on Friday.

Craig Bobchin, who was one of the volunteers who helped out with our booth, told me that he hit fog, rain, sleet, hail and snow on the way up on Friday and others reported similar experiences; this was particularly notable because just three or four days earlier we were all sweltering in record-breaking high temperatures, and those who went to the SAS conference in Big Bear City just before RTMC commented on how nice and warm it was earlier in the week up there. I'm told that temperatures got below 20° in at least some parts of Camp Oakes over Friday night, and that, though it had been very cloudy before dark, it cleared up a couple hours after dark and proved to be a beautiful night. Unfortunately, everyone had covered up their scopes or didn't set them up at all, so there were only a couple set up for viewing at widely separated points in the campground (one was Don Lynn's Dobsonian) – disappointing to those who ventured out after the clouds cleared. I noticed that all of the vendor booths had side walls up or other protection, more than I've seen in other years, and learned that, in spite of their precautions, the Ventura club lost a lot of their distinctive calendars to water damage, which was very unfortunate.

Not too surprisingly, the weather discouraged a lot of people from coming, so the crowds were much smaller than usual. Even so, we mustered a good turnout of club members for the club's annual group picture at RTMC, which should appear elsewhere in this issue. We didn't take our usual supply of books and magazines for the club's booth, as Karen Schnabel was away that weekend and she felt that it would be too much trouble for the likely return to take her supply of donated books out there and to bring back any that didn't sell. This turned out to be an excellent decision, as it would have been impossible to protect them from the general dampness. Instead, we took several long-unused items from the club's storage units (or rather, Bob Buchheim took them, along with the tables we used for the booth and the canopy) and our helpful volunteers were able to sell quite a few of them.

I covered the booth on Saturday afternoon, and had the pleasure of talking to quite a few members, past members and prospective members, as well as others who dropped by to say "hello" – in spite of the weather and low attendance, things were far from boring! One unexpected pleasure was the chance to visit with Rob Carr (our Website Technician) and his wife and young daughter, who we hope is an incipient astronomer. She was a toddler at the stage where she'd mastered the fundamentals of walking, but definitely found the uneven walking surfaces in the vendor area a challenge. This was probably more entertaining for the adults in her vicinity than for her, but she was a pretty good sport about it.

My time in the booth was pretty minimal compared to the other volunteers, who set it up and kept it going from Friday through Sunday. Besides Craig, Vince Laman , Cheryl Benedict and Nick Grewal all spent many hours running the booth, and Kyle Coker kindly brought everything back on Sunday. We owe them and Bob Buchheim tremendous thanks for their help!

Chris Butler was the keynote speaker this year at RTMC, and everyone who knows him was looking forward to his talk. Unfortunately, I missed it, but I'm told by those who were there that he was really "on" that night and that his talk was definitely the highlight of the evening, if not the weekend. It would be nice if someone made a video of it, but so far I haven't heard of any – if any of you know of one, please let me know!

Although it seems that there were a few more telescopes in operation Saturday night than on Friday, viewing opportunities were still pretty sparse compared to other years. What was more surprising was that Meade and Celestron packed up and left early – when I went to check out their booths shortly after 5:00, I found them completely empty, and I'm told that they didn't even have representatives around for the raffle to introduce the major door prizes that they donated. Scott Roberts, who worked for Meade for years but has now retired from the company and seems to be happily exploring other alternatives, graciously did the honors for both of them, which is another aspect of the evening that I'm sorry I missed.

Since RTMC is largely outdoors, weather is always a big concern. Most years, we complain about the heat and the dust during the day and have to plan for jackets at night – this year, it was coat weather even at high noon. One benefit of the damp conditions was that dust was not a problem – though those who had water damage probably didn't appreciate that as much as the rest of us!

This is all part of the fun of RTMC, which you can see when several people who have been going to RTMC for years get together and exchange stories about years with extraordinary storms or other unusual conditions. It remains to be seen whether this year will enter the annals as a historic RTMC weather year. At any rate, we're all looking forward to next year!

Starbecue Reminder – And a New Regional Star Party

As I said in last month's message, the Starbecue this year will be at the August star party, which is August 2nd. Unfortunately, it turns out that this is the same weekend as the first Julian Starfest, which its organizers hope will become a major regional star party. Since one of the selling points is the dark skies in the area where the star party will be held, it's not surprising that they would schedule it for a new moon weekend – which means, of course, that it would inevitably conflict with our own Anza star party. I know some people are planning to attend the Julian party specifically to take advantage of the dark skies, and I hope that the conditions are everything they hope for. But for many of us who regularly attend our own club star parties, the comforts and other benefits of Anza – such as power and the chance to catch up with friends – outweigh checking out this newest party in the regional star party lineup. For me, there's also the problem that I would hate to give up a night on the Kuhn, or to miss the Starbecue.

For those who are coming to the Starbecue, please see last month's President's Message for details, or e-mail me at btoy@cox.net for information. For those who are going to the new star party, please plan to give us all an account of how it went. For those who may not have been on any of the distribution lists for information about the Julian Starfest, here's a synopsis of what was circulated by one of the organizers:

The first Julian Starfest is set on Friday, August 1, through Sunday, August 3, 2008. The location is in the historic Gold Rush mountain community of Julian, high in the San Diego mountains and about 35 miles east of the San Diego Wild Animal Park via Hwy 78. The specific location is Menghini Winery, 1150 Julian Orchards Drive, Julian, CA 92036. For a Google map, please see http://maps.google.com/maps?f=q&hl=en&geocode=&q=menghini+winery,+Julian,+CA+92036&ie=UTF8&ll=33.095568,-116.608028&spn=0.057812,0.096474&z=13&om=1

The Julian Starfest website is at http://www.julianstarfest.com/, and you can get a special discount coupon at http://www.lakehodges.com/JSF-2008-Astroclub-50-EMKB603.pdf. *(Editor's Note: coupons printed out on page 11 of this issue)*

They expect excellent dark sky observing on Friday and Saturday nights. Other attractions are vendors (who are expected to offer a lot of bargains to the attendees), an Astronomy Swap Meet and presentations from special guest speakers, along with a special tour of Palomar Observatory.

There are camp sites available for tents, vans and motor homes, but you should register as soon as possible as there is limited capacity. Other websites that may be of interest are:

For information about the historic town of Julian: http://www.julianca.com/

Luxury lodgings in Julian: http://www.julianca.com/lodging/index.htm
Telescope equipped B&B: http://www.mountainhighbnb.com/
Telescope equipped Inn: http://www.observersinn.com/

For more information, please contact Kurt Barnhart, Club Coordinator, at Julianstars@expresswire.com.

I know that the organizers of the Julian Starfest have put a lot of time and energy into pulling everything together for this star party, and it is certainly in a beautiful location that offers a lot to do during daylight hours as well as at night. I hope it is a tremendous success, and I look forward to hearing about the experiences of those who go!

Southern California Astronomy Expo – July 12th and 19th

Oceanside Photo & Telescope launched the Southern California Astronomy Expo four years ago, and it has been a great success. The fourth SCAE is set on two Saturdays in July, the 12th and the 19th. The events on the first day are lectures by an array of interesting speakers starting at 11:00 in the downstairs gallery at OPT, an evening talk on when we can expect to contact extraterrestrials by the Senior Astronomer at the SETI Institute (which is devoted to searching for possible signals from intelligent life outside of earth), and a star party – the evening talk and star party are at Palomar College. As an added attraction, actress Arlene Martel will be at OPT during the day, where people can meet her, and will also introduce the evening speaker. Old timers

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AstroSpace Update

July 2008
Gathered by Don Lynn from NASA and other sources

Phoenix landed on May 25 in the far northern regions of Mars, within the target area and only a few seconds late. The landing site shows large polygonal shapes in the ground, similar to those found in arctic regions of Earth, caused by ice. In fact Phoenix sits in one such polygon, and its arm can reach the trough marking its edge to dig and analyze it. Mars Reconnaissance Orbiter was able to shoot several images of Phoenix as it descended, clearly showing the spacecraft and parachute. This is the first time one spacecraft has imaged another landing. One spectacular image shows Phoenix passing far above a large crater (6 miles across). Images after landing showed the spacecraft with enough clarity to see the solar panels extended, and the parachute, backshell and heat shield some distance away.

A few glitches arose in the first few days, but all were resolved. The orbiting spacecraft (Odyssey) that relays data to and from Phoenix went into safe mode, apparently due to a hit by a cosmic ray. The relay was back online in a day, and in any event relay could be switched to another spacecraft (Reconnaissance Orbiter) if need be. A test of the Phoenix instruments showed a short circuit in one. Further work showed where the short was, and alternate (redundant) electronics were switched in, so the instrument is working fine. The first scoop of Martian soil dropped on the entrance to the analyzer oven failed to get any of the dirt into the oven. Pictures showed lots of soil right on the oven entrance. The ovens (there are 8 of them onboard, each can be used only once) were designed to let only dust or tiny sand particles in, but the soil was all large clods. The oven entrance was shaken 6 times, and still nothing in the oven. The 7th shaking filled it. Future scoops will be sprinkled by vibrating the scoop instead of being dumped. This procedure has now been tested and shown to drop fine particles, not clods.

The Phoenix microscopic camera was used to image dust and sand grains collected on a sticky silicone collector, producing the picture with the greatest resolution ever returned from another planet. One grain appeared to be salt, but further analysis is needed. Panoramic images of the landing site have been taken. The weather report: high for the day (May 27, in case it makes a difference to you) was minus 22°F., low minus 112°, sunny (cloudless), with slightly rising dust levels in the atmosphere, the barometer reads 8.55 millibars, and wind is 13 mph out of the northeast. In other words, the weather instruments on Phoenix are working fine. One of the first tasks was to lower the digging arm under the spacecraft to take a picture of the surface on which Phoenix landed, using the camera on the arm. The landing rockets dispersed some of the surface dirt, and one object uncovered appears to be a slab of water ice. Mars Odyssey data from past years indicated that the uppermost yard of soil contains over 50% ice in much of the polar region, so this is a real possibility. Some scientists insist the object under Phoenix is salt or even a light-colored rock, so further analysis will be performed.

GLAST (gamma-ray orbiting observatory) launched June 11 on a mission to study the most violent environments in the Universe, such as black holes, jets, solar flares, pulsars and gamma-ray bursts. Many of the processes that create gamma rays are so powerful that they have not been reproduced in any laboratory, so GLAST is not just observing astronomical objects, but also doing basic high-energy physics research. GLAST is a more capable successor to the Compton gamma-ray observatory, in orbit from 1991 to 2000. Compton is the only one of the 4 NASA Great Observatories that is not still in operation. One instrument on GLAST is capable of detecting much higher frequencies (and therefore energy) than was Compton.

Black hole mass – Finding the mass of a supermassive black hole involves measuring the speed of stars near it. This requires resolving the individual stars, which can be done only on relatively nearby galaxies. So astronomers have studied how the black hole mass correlates with other properties that are more easily measured, particular from farther away. A new result is that the black hole mass correlates with the angle that arms form in spiral galaxies. Those with the most tightly wound arms had the highest mass black holes at their centers. If this relation is verified, it can be used to determine the black hole mass of any spiral galaxy whose arms can be resolved.

XMM-Newton (X-ray orbiting observatory) has observed an object designated G350.1-0.3 by its radio astronomer discoverers, which was back in the 1980s classified as a distant galaxy, and found that it is actually a nearby (15,000 light-years away) young supernova remnant. The new observations show that the supernova exploded next to a dense cloud of gas, resulting in a misshapen mass rather than the usual sphere or ring remnant. The shape is what fooled the original classifiers. The discoverers (as a supernova remnant) are going to look for other misshapen remnants to see if they are common. The light from the supernova should have arrived at Earth about 1000 years ago, but was probably not seen due to the large amount of interstellar dust in its direction. After about 20,000 years, supernova remnants dissipate enough that not much science can be done with them, so it is important to find young supernova remnants such as this.

Star formation – It has long been known that some galaxies undergo bursts of star formation that soon (in cosmological terms) stop. Many astronomers believe that bursts from Active Galactic Nuclei (AGN) (galaxy centers that are very bright due to activity about their supermassive central black hole) should disrupt star formation throughout a galaxy. Sometimes large numbers of supernovas are blamed for stopping star formation. A new study showed that both effects occur, and they have now been quantified. In galaxies with over 10 billion solar masses, the black hole activity is more effective at stopping star formation, while in less massive galaxies the supernova effect is greater. In both cases it appears that the activity blows away the gas from which stars form. The study was made of post-starburst galaxies (those not producing large amounts of stars now, but did in recent millions of years) using ultraviolet data from the Galex satellite and visible light data from the Sloan Digital Sky Survey (SDSS).

Merging galaxies – Another team imaged with the Hubble Space Telescope (HST) objects that appeared to be post-starburst galaxies with quasars (extremely bright AGN) that were found in a search of the SDSS. They found galaxy merger remnants, interacting companion galaxies, double galaxy nuclei, starbursting rings, and all sorts of messy structures. The implication is that interacting or merging galaxies cause starbursts and cause supermassive black holes at the centers of galaxies to shine brightly from material falling into them. Spectra have been taken of the imaged galaxies for further study, hoping to better confirm the consequences of galaxy interaction.

Star composition – A team of astronomers from the SDSS delivered a map of the chemical composition of more than 2.5 million stars in the Milky Way. It contains many more stars and at larger distances (up to about 30,000 light-years) than any previous star composition map. Star composition is important in trying to piece together the history and evolution of our galaxy. The earliest stars formed from gas poor in heavier elements, because that is what the Big Bang produced – just hydrogen, helium and a touch of lithium. Processes such as supernovas, stellar winds and planetary nebulas spread heavier elements produced in stars into surrounding space, where they became part of stars that formed later.

Brown dwarf masses – Astronomers using the Hubble Space Telescope (HST) and the Keck Telescope in Hawaii have measured the orbits of 2 pairs of binary brown dwarf stars. These are stars without sufficient mass to sustain the nuclear burning that lights up ordinary stars. The orbit allows calculation of the masses of the stars. One of the pairs turned out to be the least massive brown dwarfs ever found. Each was 3% the mass of our Sun. These were methane brown dwarfs, the coolest type of brown dwarf. The other pair, warmer types of brown dwarfs, each had 5.5% the Sun's mass. The measurements did not agree with brown dwarf theory in that one pair was too cool for its mass and the other too warm. Theorists will have to go back to work to explain these. The extreme resolution of HST and the Keck (with adaptive optics) was needed to resolve the pairs of brown dwarfs, since they were orbiting quite close to each other. There are hundreds of brown dwarfs known in our neighborhood, but only about 15% of them are binary, and few of those have had their masses measured, due to the difficulty of observing objects so close to each other.

Missing matter – HST has observed 28 very distant quasars to determine what spectral lines are imprinted on the light by clouds of gas through which the quasar light has passed. More than 650 clouds were identified in the observations. Since ionized hydrogen has no visible light spectrum, the amount of ionized hydrogen was calculated from its known correlation with highly ionized oxygen, which was measured. The total average density of gas was then calculated. Various methods of measuring the total density of baryonic matter (protons and neutrons) in the Universe calculate amounts substantially larger than what is seen in galaxies and galaxy clusters (including much gas seen only in X-rays). The HST observations were designed to see if gas not in galaxies or their clusters (called intergalactic medium or IGM) constituted the missing baryonic matter. The conclusion is that the IGM measured in this new HST study is about half of the missing baryonic matter. Another result of this study is that about 80% of the matter in the IGM lies within the filaments of greater density (which contain most galaxy clusters) and the other 20% is in the so-called voids between filaments. This missing baryonic matter is not to be confused with the missing non-baryonic matter (often called dark matter), which remains completely missing.

Spitzer (infrared space telescope) has produced a map of the Milky Way galaxy better than any previously produced, because infrared penetrates the dust hiding much of our galaxy from our view. The map was made by a star-counting computer program applied to the infrared images. It showed that the Sagittarius and Norma arms of the galaxy are not the major arms previously thought, but only minor ones. That leaves the Milky Way with only 2 major arms, the Scutum-Centaurus and the Perseus. The map also shows that these 2 major arms originate at the ends of the central bar, as assumed, but not previously demonstrated.

Spitzer also produced a huge image of the central third of the Milky Way, a **mosaic** of 80,000 individual images. It shows about 100 million stars.

Cassiopeia A – Light echoes (the sphere of light expanding from any bright flash, seen reflecting off clouds of interstellar matter in its path) from the supernova called Cassiopeia A have revealed its type. Supernovas are classified by type according to whether hydrogen, helium or other elements are seen in the spectrum of the supernova light while it is still visible. But Cassiopeia A faded 300 years ago. This new work shows that spectra of light echoes can also be used. Cassiopeia A was a Type IIb, which occurs when a red supergiant star collapses and explodes at the end of its life. There is only one possible observation of Cassiopeia A exploding in 1680. It has been a puzzle why more observations were not made of such a bright object as a supernova. However, Type IIb supernovas are known to fade quickly, so just a little cloudy weather could have hidden it entirely. The light echo observations were made with the Spitzer space telescope and the Subaru telescope in Hawaii.

Magnetar ring – Spitzer has imaged a ring about a magnetar (a neutron star with a tremendously strong magnetic field), something never seen before. The ring probably formed when this magnetar erupted in a giant flare in 1998. The best theory is that there was a dust disk about the magnetar before the eruption, and that the blast blew a hole in the disk, leaving its outer part as a ring. We are seeing the ring because it is lit by starlight from stars near it. The ring was at first thought to be a light echo, but later observations showed it was not expanding as a light echo would. The discoverers plan to look for other objects like this to see if they are common.

EPOXI (formerly Deep Impact comet mission) spent most of May staring at the red dwarf star GJ436, known to have one transiting planet (one that passes in front of its star), in hopes of detecting other planets or irregularities in the planet that imply other planets. Analysis will take some time. The known planet is in a very elliptical orbit, thought to be a sign that there are other planets

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A Life Under The Stars

(part 1 of a 2-part series)

Lance Humphreys

My First Telescope

My first telescope was a 3" refractor on an alt-azimuth mount, the kind most kids start with. It was a present from my mother for my 13th birthday. I can still remember how amazed I was at seeing the craters on the moon and the rings of Saturn!

I grew up in a 1930's farm house in Orange County, California. It was dark enough back then to faintly see the Milky Way. I still recall orange groves everywhere. In fact, I can still remember driving along Interstate 5 in back of the old station wagon and smelling the orange blossoms. Irvine Ranch was a farm, not a city! It stretched from the coastal mountains to the beach. Newport Beach had no buildings over 3 stories high. Oh yes, it was still a place where one could enjoy the stars. I even remember the shop in Long Beach where Cave Telescopes were made & sold. These were great scopes and had the best mirrors.

But in time the little 3-inch had showed me all it could and went into the basement. It wasn't until 1986 during the return of Halley's Comet that it finally saw light again. Now it sported a nice dent on the tube and a lot of scratches. But when i took the dust covers off the objective was in great shape!

I drove out to Santiago Canyon road in January with some friends and found a group of people set up in a roadside turnout. I eagerly put the scope on its tripod and with someone's help saw Halley's Comet for the first time. That night I looked through some larger scopes and was hooked! The next day I bought my first Sky & Telescope magazine so I could learn more. The sky charts for the comet were great and I followed the comet until it was gone. I also found out that there were amateur astronomy clubs listed in the magazine. This was when I decided to join the Orange County Astronomers and get more into the hobby.

The OCA Observatory

In 1987 I joined the Orange County Astronomers and was sent my first newsletter. In it they listed the next Star Party for the Saturday nearest the New Moon that month. The OCA's dark site is 90 miles away in Riverside County, near the small town of Anza. We drove up into an area 25 miles NE as a crow flies from Palomar Observatory. In fact, we could see the 200-inch telescope's white dome just over the next ridge. Here I was amazed once again by the night sky. The OCA's dark site back then had a couple of smaller private observatories and three dozen member pads with power. They also had a large community pad that would fit a dozen scopes easily and the flat "football field" that was more than enough for anyone else to use and for future expansion.

The club had been up and running for around 10 years. They had the club's Kuhn 22" cassegrain in a roll off observatory. This was hand-built by Bill Kuhn in his garage. Bill and the scope even made it into the old Telescope Makers magazine. At the time John Sanford was President and Wayne Johnson was Vice President. They ran the 22" like pros, Wayne even discovered a number of Supernovae with it. I recall John was glued to the C-14 in the SW corner of the observatory most of the time. They were the best of host and everyone had a great time!

My First Observatory

After a year of being a member of the Orange County Astronomers I was in love with the dark sky. I started to look for a place where I could build my own observatory. In January of 1989 I bought my first house. It was not next door to the OCA but it was close by. The place I fell in love with was two miles out of Anza's village center. It sat 4,200 feet on Table Mountain, the easternmost section of Anza Valley.

The view to the west is hay fields in the Winter and potatoes in the Summer. Then off on the horizon sat the beautiful rocky, jagged peak, Cahuilla Mountain. To the east loomed Santa Rosa Mountain and then desert below. The north was just fields with a ranch or two, then 6,500-foot Thomas Mountain, and peaking up from behind it San Jacinto at 10,000 feet. The view to the South featured the observatory dome on top of Palomar, just three mountain ridges away. But by far the BEST view was the Milky

Way. To walk out my front door and see the Milky Way made me feel like I was in the best place on the planet.

By spring of 1986 i had completed my own observatory, housing a C-11. I was so happy to roll off that roof and search the night with my Sky Atlas 2000.0 to the sound of coyotes howling.

Making It Under the Milky Way

I had left the fast growing suburbs of Orange County in 1986 and bought my first house in Anza Valley where it was dark and I could do my astronomy. Now the trick was how was I going to get by? All I had was a lawn mower and a pick-up truck. Before I bought this place under the Milky Way I worked 2 jobs: mowing lawns by day, then by night degreasing large dealership garage bays. This gave me the down payment on my rural property with a 15-year mortgage, but I was nearly broke.

My wife worked selling insurance off the hill and I mowed lawns on and off the hill. It took two years to really start making some good money building a business from scratch. The landscaping business was like poker: I kept the high cards (accounts) and tossed the low ones. After a time I only did riding mower work on large horse ranches and even moved up to a tractor with a brush hog and did large 5-acre fields too.

It was great! In time I did all the big places in Anza: the bank, the Post Office, and I even had the contract with Anza Electric. At night I looked through my scopes; during the day I did my landscaping. With no time clocks to punch I finally had it made.

I never ran an ad in the papers. My business was all word of mouth. I showed up when I said I would show up, and I treated their property like it was my property. I was always going the extra mile, and even had a sliding scale for the poor and the retired folks for whom I worked.

At this time I was still going out to the Orange County Astronomers dark site. By now, living under dark skies made me a pro. Going to the star parties no longer required the 100-mile drive. I was 15 minutes away, and I just loved the small town life. Not to mention my scope had an observatory, so no more hassle with set up and tear down.

Living in Anza, my landscape business had no competition to speak of. Now, with things going so well, I was in the position to add on to the C-11's observatory and get a bigger scope.

The Observatory Gets Bigger

By 1991 I was getting a severe case of aperture fever. Just up the mountain from Anza is the beautiful mountain town of Idyllwild. This was where the legendary Coulter Optics was located. They made the most affordable dobs on the planet and always ran ads in Sky & Telescope. So for $995 I bought the 17 1/2-inch model and installed a pair of digital setting circles. Now i had my dream scope! The new big dob had its own observatory, with an 11 X 11 roll off roof. This sat right next to the C-11's observatory which made it easy to go from scope to scope.

With the big scope, i could really resolve those globular clusters and hunt down those faint galaxies. The galaxy clusters were just so much fun to do. And in a few years i had seen nearly every object plotted on the old Sky Atlas 2000.0. I loved going to the Orange County Astronomers star party with the new 17 1/2 inch. Just put that big red tube on a mattress in the back of the pick up, strap her down and go. At this time it was the biggest scope in the lower pad area and always gave the best views.

By now everyone in Anza knew me as "The Astronomer." My observatory was known as the place where people could come by for a look through "a real big scope."

(to be concluded next issue)

(continued from page 5)
perturbing it. EPOXI is capable of detecting much smaller changes in brightness due to transits than can be accomplished from Earth. The spacecraft has plenty of time on its hands as it proceeds toward a 2010 rendezvous with comet Hartley-2.

Small planet – Most of the nearly 300 planets found to date have been hot Jupiters, that is, large planets that orbit so close to their star that they are quite hot. This is because the most successful technique so far for finding planets, looking for wobbling stars due to their planets' gravitational effect, is most sensitive to massive planets close to their stars. A planet just found by another technique, gravitational lensing, is by contrast far smaller, only 3 times the mass of the Earth. Lensing involves watching thousands of stars over long periods to see if brightness changes occur that are characteristic of one star passing in front of another, so the foreground one bends light from the background one by its gravity. The mass of the foreground star can be calculated from the observations. Once in awhile, the brightness changes show that there is a smaller companion object. Unfortunately lensing events cannot be repeated, limiting the science that can be done. From a recent lensing event, the star MOS-2007-BLG-192L was found to be orbited by the 3-Earth-mass planet. The star itself has a very small mass, and may be a brown dwarf rather than an ordinary star, though the uncertainty in the calculation allows either. The star and its planet are about 3000 light-years away.

Whirling asteroid – The fastest spinning natural object in the Solar System is the recently discovered asteroid 2008 HJ, rotating once every 42.7 seconds. It was found by a retired amateur astronomer in Britain using the Faulkes South, a 2-meter telescope in Australia operated over the Internet. He was searching for asteroids, not necessarily record breaking ones. The previous record spinner was asteroid 2000 DO8, with a 78-second rotation. The newly found asteroid is about 40 by 80 feet across.

Space Shuttle Discovery delivered the main body of the Kibo (means "hope") science lab, built by Japan, to the International Space Station (ISS) in early June. This is the largest module yet attached to ISS, and provides space enough for 4 astronauts at once to do science. The lab is equipped to experiments in space medicine, biology, biotechnology, material production and communications. A future mission will bring the outside part of the lab, where experiments can be exposed to the vacuum of space, and be manipulated from inside with a robot arm. Also making the trip to ISS were a Buzz Lightyear toy, which will be used by NASA in educational outreach activities after Buzz's return to Earth, and a new pump for the malfunctioning ISS toilet.

Mars rover Spirit set a record in late May for the lowest solar panel output, a consequence of extremely dusty solar panels and the Sun quite low in the sky for winter. By curtailing nearly all science and many radio transmissions, Spirit has been able to run the heaters that keep its batteries and most sensitive (to cold) instrument in good health. Only occasional atmospheric observations will be made until the Sun gets higher with the change of seasons.

Mars rover Opportunity – Rover controllers have developed a new stowing position for the instrument arm, which is partially unstowed far enough that it can reach rocks, but not far enough to interfere with driving. It was tested in 2 short drives and found satisfactory. This solves the problem with the motor in the shoulder joint of the arm that often doesn't work. Opportunity cautiously tried crossing a sandy stretch between it and its target of Cape Verde, a promontory jutting out into Victoria Crater, inside which the rover is exploring. When wheel slippage reached 90%, it was decided to carefully back out and try a different route.

Solar Probe + – NASA has approved a mission to the Sun, which will approach it much closer than any previous spacecraft. The reason for the "+" in the name is that it is expanded from a previous proposal named Solar Probe. The heat shield will be designed to withstand over 2500° F and survive stronger radiation than any previous spacecraft. The solar panels will be liquid cooled, and can be retracted behind the heat shield. It is planned to launch in 2015 near solar minimum and continue to operate until solar maximum about 2022. The principal science goals are to find out how the solar wind accelerates to over a million mph and how the outer corona (solar atmosphere) is heated to 100 times the temperature of the surface. Instruments include a magnetometer, plasma wave sensor, dust detector, electron and ion analyzer, and Hemispheric Imager, which makes 3-D images of the corona using tomography. After 7 flybys of Venus, the spacecraft will attain an orbit that repeatedly dips down to within about 4 million miles of the Sun (23 times closer than we are here on Earth).

Jupiter spots 1 – Analysis of data taken by the Pluto-bound New Horizons spacecraft as it passed Jupiter last year show that the winds in the Little (Junior) Red Spot (LRS), at up to 384 mph, are substantially faster than the winds in the white storms from which the LRS developed. The winds in the predecessor white storms had been measured by Voyager and Galileo spacecraft.

Jupiter spots 2 – As if Jupiter didn't have enough red spots, a third red spot has now appeared. Like the LRS, it developed from a white storm, apparently when it developed greater height, which somehow fosters the red coloring. But unlike the LRS, it is in the same horizontal band as the GRS, and will probably overtake it in August, at which time it will either be consumed or repelled back the way it came.

COROT (transit planet search satellite) has discovered 2 hot Jupiter type planets and an object that might be a planet or a brown dwarf. The diameter is too small to be either a super Jupiter planet or a brown dwarf star. The mass is about 20 times that of Jupiter. The density has been calculated at twice that of the metal platinum, which is extremely dense. More observations and more theory will have to be done on this object.

(continued on page 11)

(continued from page 3)

among us remember her as T'Pring, who did not marry Mr. Spock in the original Star Trek, but she has played many other roles, and I have been told by someone who has met her at other functions that she is a charming and very interesting person.

The second day of SCAE is Vendor Day – they expect almost 40 vendors to be there to show their latest gear, answer questions, give demonstrations, etc. There will be free mini-seminars during the day, a free pizza lunch, and some great door prizes for the drawing at 6:00 (including three grand prizes donated by FLI, Vixen and Meade). As though that wasn't enough, attending the SCAE events is free – it's really hard to beat that bargain!

Anza Weeds Revisited

Unfortunately, the weeds out at Anza don't keep to a fixed schedule, and we tend to get more growth whenever we get moisture. The late rainstorms we had this year caused a burst of growth after a lot of people had cleared the areas around their pads and observatories, and then the mustard started popping up, as well – it's generally a latecomer on the weed scene. Even though our deadline for clearing weeds and brush is the end of May each year, the reality is that we can get a lot of growth after that, so this is a continuing chore. If you are out at Anza and see weeds or brush around the areas you use on the site that should be cut back, particularly in the general-use areas, please give us a hand and trim them while you're there. We have a club-owned Weed Wacker and a larger weed trimmer that looks a bit like a power lawnmower in the storage container by the observatory, as well as a chipper, which all members are welcome to use to help with the clearance.

We can't get trash service at Anza, which is why we have the general rule that people need to remove any brush they cut or other waste they produce on site. However, if you use the chipper to reduce cuttings to small pieces, they can be safely spread in areas where we need to control runoff, and that can save you some hauling as well as helping to control erosion. Leaving whole branches or other large pieces of material around the site without chipping them gives hiding places for snakes and other critters, and also can pose a tripping or fire hazard, which is why did they either need to be removed or chipped.

If everyone helps out a bit, we should be able to keep the weeds and brush under control without it being too much of a burden for anyone. Our thanks to all of you who help out with this important work for the safety of all of us!

On a Personal Note...

Although it won't change anything as to the club, including names, I thought I'd mention that Alan Smallbone and I were married on June 20. I guess our "honeymoon" will be our next trip out to Anza – it's great to have a partner who loves the place as much as I do!

Swift (gamma-ray burst satellite) was observing a month-old supernova when another supernova in the same galaxy (NGC 2770) gave off a burst of gamma rays. Supernovas give off gamma rays just before they explode in visible light. So the gamma ray astronomers alerted their colleagues and got the Hubble Space Telescope, Chandra X-ray observatory, the Palomar telescopes, Gemini telescope, Very Large Array radiotelescope, Apache Point and other telescopes to observe as the supernova exploded. This is the earliest a supernova has been knowingly observed.

Instant AstroSpace Updates

The Very Large Telescopes in Chile, used together as an interferometer, were able for the first time ever to image the immediate surroundings of a **supergiant** star (WOH G64) in another galaxy (the Large Magellanic Cloud), and found a thick dust torus (donut shape), as predicted theoretically. Astronomers want to know how such stars lose considerable mass before they explode as supernovas.

Ulysses (polar solar mission) is scheduled to be turned off about July 1, ending its 17-year mission, the only one to ever observe the Sun from outside the plane of the planets. Its radioactive electrical generator is no longer supplying enough power to keep the attitude fuel from freezing.

The IAU, the organization who brought us the term dwarf planet, has invented a new term for dwarf planets that orbit beyond Neptune: **Plutoids**. There are only 2 Plutoids known so far: Pluto and Eris.

FOR SALE: brand-new items - 8'F/6 Discovery Optics 1.5" Pyrex Mirror cell; 8"University Optics Alum Mirror Cell; Vega-HP1-1.25"Focuser (Japan Made); Vega-3 Low Profile Helical 2" Focuser; 48 Rini2 Eyepiece in Bolt Case (this item not new but seems to be in good condition. Will sell these items seperately or as a package for $300.00. Contact Doug 562-598-6103

NASA's Space Place

Space Buoys

By Dr. Tony Phillips

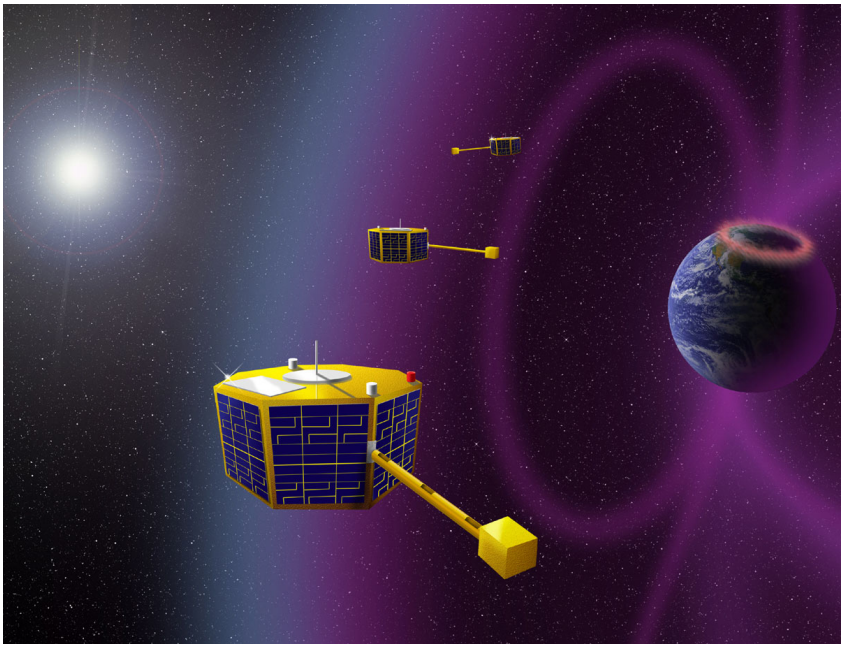
Congratulations! You're an oceanographer and you've just received a big grant to investigate the Pacific Ocean. Your task: Map the mighty Pacific's wind and waves, monitor its deep currents, and keep track of continent-sized temperature oscillations that shape weather around the world. Funds are available and you may start immediately.

Oh, there's just one problem: You've got to do this work using no more than *one* ocean buoy.

"That would be impossible," says Dr. Guan Le of the Goddard Space Flight Center. "The Pacific's too big to understand by studying just one location."

Yet, for Le and her space scientist colleagues, this was exactly what they have been expected to accomplish in their own studies of Earth's magnetosphere. The magnetosphere is an "ocean" of magnetism and plasma surrounding our planet. Its shores are defined by the outer bounds of Earth's magnetic field and it contains a bewildering mix of matter-energy waves, electrical currents and plasma oscillations spread across a olume billions of times greater than the Pacific Ocean itself.
"For many years we've struggled to understand the magnetosphere using mostly single spacecraft," says Le. "To really make progress, we need many spacecraft spread through the magnetosphere, working together to understand the whole."

Enter Space Technology 5.



The Space Technology 5 micro-satellites proved the feasibility of using a constellation of small spacecraft with miniature magnetometers to study Earth's magnetosphere.

In March 2006 NASA launched a trio of experimental satellites to see what three "buoys" could accomplish. Because they weighed only 55 lbs. apiece and measured not much larger than a birthday cake, the three ST5 "micro-satellites" fit onboard a single Pegasus rocket. Above Earth's atmosphere, the three were flung like Frisbees from the rocket's body into the magnetosphere by a revolutionary micro-satellite launcher.

Space Technology 5 is a mission of NASA's New Millennium Program, which tests innovative technologies for use on future space missions. The 90-day flight of ST5 validated several devices crucial to space buoys: miniature magnetometers, high-efficiency solar arrays, and some strange-looking but effective micro-antennas designed from principles of Darwinian evolution. Also, ST5 showed that three satellites could maneuver together as a "constellation," spreading out to measure complex fields and currents.

"ST5 was able to measure the motion and thickness of current sheets in the magnetosphere," says Le, the mission's project scientist at Goddard. "This could not have been done with a single spacecraft, no matter how capable."

The ST5 mission is finished but the technology it tested will key future studies of the magnetosphere. Thanks to ST5, hopes Le, lonely buoys will soon be a thing of the past.

Learn more about ST5's miniaturized technologies at nmp.nasa.gov/st5. Kids (and grownups) can get a better understanding of the artificial evolutionary process used to design ST5's antennas at spaceplace.nasa.gov/en/kids/st5/emoticon.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Dear Friends and Aquaintences,
I couldn't make the Riverside Conference swap meet so I'm writing a general message to announce a sale of some items which I no longer need. First come first served, checks OK. Please add $5 for shipping per order except for the 4x5 camera; which we'll have to discuss modes of delivery. Thanks for looking!
Note: Items available on AstroMart as of June 1st.
John Sanford (starhome@springvillewireless.com)

Oculars: (All 1.25" dia)
5mm Galoc ortho made by Telescopics in L.A. (actually marked ".24 in.") $30
28mm Galoc $30
13mm Meade series 4000 (82d field), also fits 2" dia. $75
15mm Edmund RKE (old anodized model) $30
28mm RKE (old anodized model) $30
40mm Parks Plossl (edge chip) $5
Criterion solar filter/Barlow lens (apparently they took a Barlow lens and put a dense nickel/aluminum coating on it for solar use) Rare.

Orion erector prism assembly (1.25") $25
Celestron 10x70 finder (with crosshair, off C-14){some blooming in objective not affecting performance} with bracket $50
Meade 6x30 finder with crosshair, with bracket/rings $20
50mm Minolta Rokkor MD f/2 SLR lens $25
135mm Minolta Rokkor MD f/3.5 SLR lens $35
2" R&P focuser off Meade DS-16 $35
and for the photographers among us:
Linhof III Technika 4x5 metal technical camera (ca. 1950) with rangefinder & groundglass focusing $450 (has Fresnel)
75mm f/8 Super Angulon on board for Linhof $300
80mm f/8Wide Field Ektar on board for Linhof $80
90mm f/8 Angulon on board for Linhof $100
150mm f/5.6 Schneider Symmar on board for Linhof $250

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HANDY CONTACT LIST

CLUB OFFICERS			
President	Barbara Toy	btoy@cox.net	714-606-1825
Vice-President	Craig Bobchin	ETX_Astro_Boy@sbcglobal.net	714-374-7054
Treasurer	Charlie Oostdyk	charlie@cccd.edu	714-751-5381
Secretary	Bob Buchheim	rbuchheim@earthlink.net	714-971-8427
Trustee	Sheryl Benedict	Sheryl_Benedict@yahoo.com	714-726-6971
Trustee	Sheila Cassidy	rivme@pacbell.net	951-360-1199
Trustee	Steve Condrey	stevecondrey@verizon.net	951-678-0189
Trustee	Tom Kucharski	TomRigel@aol.com	949-348-0230
Trustee	Gary Schones	gary378@pacbell.net	714-556-8729
Trustee	Steve Short	nightskytours@hotmail.com	714-771-2624
Trustee	Alan Smallbone	asmallbone@earthlink.net	818-237-6293
COMMITTEES, SUBGROUPS, AND OTHER CLUB VOLUNTEERS			
Anza House Coordinator	Steve/Sandy Condrey	OCAAnzaHouse@yahoo.com	951-678-0189
Anza Site Maintenance	Don Lynn	donald.lynn@alumni.usc.edu	714-775-7238
Beginner's Astronomy Class	David Pearson	astrodwp@dslextreme.com	949-492-5342
Black Star Canyon Star Parties	Steve Short	nightskytours@hotmail.com	714-771-2624
Explore the Stars - OCA Contact	Richard Cranston	rcransto@ix.netcom.com	714-893-8659
Librarian	Karen Schnabel	karen@schnabel.net	949-887-9517
Membership, Pad Coordinator	Charlie Oostdyk	charlie@cccd.edu	714-751-5381
Observatory Custodian/Trainer/ Member Liaison	Barbara Toy	btoy@cox.net	714-606-1825
OCA Outreach Coordinator	Jim Benet	jimbenet@pacbell.net	714-693-1639
Sirius Astronomer Editor	Steve Condrey	stevecondrey@verizon.net	951-678-0189
Telescope Loaner Program	Mike Myers	loanerscopes@twow.com	714-240-8458
WAA Representative	Tim Hogle	TimHogle@aol.com	626-357-7770
Website Coordinator	Rob Carr	RCCarr1@excite.com	909-606-1241
Website Editor	Hassi Norlén	hassi@norlens.net	714-710-9444
SPECIAL INTEREST GROUPS (SIG's)			
AstroImagers SIG	Tom Kucharski	TomRigel@aol.com	949-348-0230
Astrophysics SIG	Chris Buchen	buchen@cox.net	949-854-3089
Dark Sky SIG	Barbara Toy	btoy@cox.net	714-606-1825
EOA Liaison	Del Christiansen	DelmarChris@earthlink.net	714-895-2215
GoTo SIG	Mike Bertin	MCB1@aol.com	949-786-9450