

SIRIUS ASTRONOMER

www.ocastronomers.org The Newsletter of the Orange County Astronomers

August 2008

Free to members, subscriptions \$12 for 12 issues

Volume 35, Number 8



OCA members make the annual pilgrimage to the Riverside Telescope Makers Conference, May 24-25, 2008. See if you can count the correct number of Chris Butlers in this shot! If you want to be in this picture, and not force us to duplicate anyone, be sure to show up next year!

OCA CLUB MEETING

The free and open club meeting will be held Friday, August 8th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. The main speaker is Dr. Philip Humphrey of UC Irvine, discussing his research on black hole mass.

NEXT MEETING:
September 12th

STAR PARTIES

The Black Star Canyon site will be open on August 30th. The Anza site will be open on August 2nd and August 30th. 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: Aug. 19th, Sep. 16th

EOA SIG: Aug. 27th, Sep. 24th

Astrophysics SIG: Aug. 15, Sep. 19th

Dark Sky Group: TBA (contact coordinator for details)

President's Message

By Barbara Toy

By the time you read this, the Starbecue at the August our party will probably be behind us, as the star party is August 2nd. I hope you were able to come and that you had a good time. If you happen to read this before the star party, please do come and I look forward to seeing you there!

Anza Weather

Historically, August is in the heart of our monsoon season, which has a much greater effect at Anza than back in Orange County, bringing all of the issues that come with lots of thunderstorm activity, including lightning strikes and flash floods. The high currents from lightning strikes in the area caused us a lot of problems in the past with our on-site network, which is the main reason Vance Tyree installed fiber optic cable as the backbone of the system a couple years ago (and thanks again to Vance and everyone else who helped out with that project – that was a lot of hard physical labor!). While we're still working out some issues with the network and with our Internet access, the new cable has been a great success in stabilizing the system, particularly during the summer months.

Now, the main effect these storms have on us is from all the water they drop, usually in heavy cloudbursts that do a lot of damage to the dirt roads. In more severe cases, they can cause flash floods, so, if you see water crossing the road when you're driving around Anza when there's any storm activity in the area, please be very careful about crossing it, as it can pack a lot more power than you might think and can rise very fast. High winds associated with the storms can also cause a lot of damage. If one of the storms hits our Anza site during a star party – which has happened – it can mean a lot of wet equipment. However, these storms move through pretty quickly, and even when the clouds look grim during the day, they usually clear up an hour or two after sunset, rewarding those who have the patience to outwait them – even when we've had rain from one of the storms during the day.

More Parking Changes at Chapman University

About a year ago, Chapman University changed the parking arrangements on campus, so we were only able to park in two lots for our general meetings. The closer of these was the underground parking below the athletic field, which has stairs that exit near the Commons, just a couple buildings away from where we meet in the Hashinger Science building. The university gave us parking permits, however, so we could park in these two lots without paying any charges.

I'm sorry to report that they have changed their parking policy again, and that we can no longer get free parking permits. Parking is still restricted to the two lots we've been using, but, per the information given to Charlie Oostdyk, anyone who parks in either of the lots will have to pay a small charge on entering the parking structure. At this point, I don't know what the charge will be, but we believe it is on the order of a couple dollars.

People with handicapped stickers can still park in the parking lot next to Hashinger Hall in the handicapped parking spaces without charge. People can also park on the campus side of Center and Palm without charge. Parking on the residential side of those two streets will result in a ticket, as will parking anywhere on campus other than the two designated lots. You can also park on Glassell south of the campus without charge, and there may be areas in the residential community around Chapman University where street parking is available without a restriction to permit only that would still be within reasonable walking distance from where we meet – that used to be the case, but I haven't had a chance to check the current situation with residential parking since I learned of this change.

While this change in policy is a serious inconvenience, Chapman has been very generous in allowing us to use its facilities without any charge and in allowing us free access to parking for so many years. I don't know what concerns the University had that led to this new policy, and it's hard to believe that this will bring in enough money to make much difference to the University or its programs, but it would be ungracious and probably counterproductive on our part to try to fight it too aggressively. Of course, we will do what we can to change their minds on this, but right now we expect that this will be the policy we'll have to work with.

To those of you who asked me about the new permits at the July meeting, my apologies – at the time, I thought that we would be getting new permits on the same terms that had been in effect since our parking was restricted to the two parking structures. We didn't get the information about the new requirements until after the July meeting. Charlie posted the information about this on the website when he found out about it, and we'll put any further information we receive on the website, as well.

Please don't let the concerns about parking keep you away from the meetings – even if you have to pay a small fee for parking, the meetings are well worth it!

Farewell to Matt Ota

Up to a couple years ago, when he moved to Gardena in Los Angeles County due to his job, Matt Ota was very active in our Outreach program, the GoTo group, the AstroImage SIG and the Astrophysics SIG, as well as regularly attending our general meetings and star parties at Anza and Silverado (our Orange County site before it was moved to Black Star Canyon). If you were around in the club back then, you are probably familiar with him, and, even if you didn't know him personally, you've probably benefited from his many contributions to the club. Among his more tangible contributions – he designed the new signs we have out at Anza and had the work to produce them donated to the club, he repainted many of the older signs to make them more

legible, put in reflectors along many of the roadways and pathways on site to make it easier to move around the site at night (with assistance from Bill Hepner, who also helped install the signs), provided the site maps that are installed in Anza House and the club observatory, designed and made the banners that we used for AstroImage 2002, 2004 and 2006 (and modified them as needed), and designed the club buttons and bumper stickers. He also served as a Trustee on the OCA board, helped put together the "Astronomy Jeopardy" games that gave us a lot of amusement at a couple of club meetings, and generally helped out in any way he could whenever he saw a need.

His brother was severely injured a few weeks ago, and Matt is moving to New Hampshire to take care of him. This is likely to be a permanent move, because of the severity of the injuries, though Matt is hoping he'll be able to revisit Southern California periodically. This has all happened very suddenly, and completely changed Matt's expectations of how he would be spending his life – although there are a lot of friends and activities that Matt is leaving behind him here in California, I am happy to report that, when I talked to him about his plans at the July Astrophysics meeting, he'd had a chance to learn more about the astronomical activities available in the area where his brother lives, and was making plans for becoming active in that community.

I have a lot of great memories of club events where Matt and I were both participants. One of the first was a solar observing event at the Tanabata (or star) Festival in Long Beach, which was the first daytime outreach I attended, and which Matt organized. My particular memories of that event are of Matt handing out an account of the Japanese legend that is the basis for the festival, involving Vega and Altair as lovers separated by the Milky Way, and of seeing the sun through hydrogen alpha filters for the first time and developing an intense case of equipment-envy (always a hazard in our hobby!). Another memory is from a later daytime event, this time a youth festival at the Orange County Fairgrounds, which was capped by Matt demonstrating unequivocally that he is an astronomer first and foremost – somehow, his telescope fell, and he managed by purely reflex action to put his body between it and the ground. As I recall, he had some pretty big bruises after that, but he brushed off our expressions of concern and was most worried about whether his telescope had been damaged by the fall (thanks to the fact it landed on him rather than the ground, it wasn't). More miscellaneous memories include him giving tips on where to get astronomy-grade milar for solar filters and how to make a cell to hold it in place along with many other practical tips, and learning about the Telescopes In Education program that he participated in for several years at Mt. Wilson.



(continued on page 9)

AstroSpace Update

August 2008

Gathered by Don Lynn from NASA and other sources

Messenger (Mercury mission) – Further analysis of the data gathered during Messenger's flyby of Mercury last January has found surface features that appear to be volcanoes, that the smooth plains appear to be ancient lava flows, like those on our Moon except much lower in iron content, that the planet's magnetic field is apparently caused by motion within the iron core, that past core shrinkage was at least 1/3 more than previously believed and it caused the scarps on the surface, and the exosphere is caused by atoms and molecules knocked aloft by solar radiation, solar wind bombardment and meteoroid collisions. The Caloris basin, one of the largest impact basins in the Solar System, is ringed by volcanoes, which were probably results of the impact. That impact occurred during the first billion years of Solar System history. The floor of Caloris was found to definitely be ancient lava flow. Subsidence of the Caloris floor caused wrinkle-ridges, and later uplift formed graben, which are troughs. This is a much richer geological history for Caloris than previously believed.

Mercury's core makes up 60% of its mass, which is at least twice as large as any other planet. Cooling of this huge core has resulted in more shrinkage than previously thought, resulting in the surface wrinkling. These wrinkles are what scientists have been calling the "lobate scarps", long curved cliffs seen abundantly on Mercury. The exosphere is an extremely thin atmosphere. Messenger data showed that it is definitely composed of surface material thrown aloft, including hydrogen, helium, sodium, potassium and calcium. Solar radiation pressure slowly pushes the exosphere into a tail away from the Sun. Abundances of elements were found to differ according to day or night, solar wind strength, magnetic field, and possibly latitude. Mercury's surface is the most space-weathered, being closest to the Sun. Messenger will flyby Mercury twice more before going into orbit in 2011.

Phoenix (Mars lander) controllers have been practicing ways to get soil samples into the oven-analyzer. This seemed like a good idea after the first sample lost its water to evaporation (sublimation) during the few days it took to get the clumpy soil into the tiny opening. Also a short circuit occurred during baking of the first sample, and it is not clear if permanent damage to the ovens could occur with continued use. So they plan to get it right for the next sample: soil that includes ice, with no clumps, that goes quickly into the analyzer. The rasp tool seems the best bet to provide fine material that would slip right into the oven. Trials with the 2 kinds of scraping blades have not been very successful on the deeper, harder soil. Despite the negative finding for water in the first sample in the oven analyzer, water ice has definitely been found by Phoenix. Repeated images taken of a shallow trench dug by Phoenix's scoop showed that white lumps were evaporating (technically subliming, that is, evaporating from ice without melting to liquid) at a rate that could only be water ice at the temperature and pressure there.

In the mean time, 2 soil samples were placed in the Phoenix wet chemistry analyzer. The first was found to be fairly alkaline, with a pH of between 8 and 9, not the acid that many scientists expected. Preliminary results show magnesium, sodium, potassium and chloride in the soil. This agrees with the Rover results that show many types of salts on the surface, probably left by evaporating standing water at some distant past time. The imagers continue to take panoramic stereo color pictures of the surroundings. The optical microscope has completed examining 2 samples of the soil. At least 4 distinct minerals were seen, including larger black glassy particles and smaller reddish ones. The fine particles resembled the airborne dust that the microscope examined earlier. Particles were found to clump together even at the smallest visible scale. This clumping is what made it so difficult to get the first soil sample into the oven analyzer. The record that the optical microscope set for the highest resolution image from another planet has been broken by Phoenix's atomic force microscope, which resolves down to 1/250,000 inch, and took its first image of Martian soil particles. Phoenix stuck its fork into the ground to measure the electrical and heat conductivity of the soil. The fork can also measure (and has) the moisture in the atmosphere when aloft.

Mars water – A study of data from all the Mars landers has shown that the planet was once wet, warm and of sufficient atmospheric pressure for dew or drizzle to have occurred. The conditions do not occur today that would allow liquid rain or dew – it would freeze or evaporate immediately. The evidence is that the chloride in the soil is deeper than the sulfate layer. This is caused by moisture being deposited on the surface and moving down through the soil, carrying the more soluble chlorides farther. This moisture could be from dew or light rain. Other evidence of surface water on Mars in the past pointed toward subsurface water breaking onto the surface, which generally places chlorides on top of sulfates, not the order seen by the landers.

Mars dichotomy – Study of gravity and elevation data from Mars Reconnaissance Orbiter and Mars Global Surveyor has shown that the differences between the northern and southern hemispheres of Mars are probably due to a very large impact early in the planet's history. The northern-hemisphere basin, called the Borealis Basin, is one of the smoothest surfaces found in the Solar System. The southern hemisphere is higher by 2.5 to 5 miles, and is rough heavily cratered terrain. This dichotomy of the hemispheres has been known since the first detailed images were returned by spacecraft in the 1970s. The proposal was made in 1984 that the northern hemisphere was a huge impact basin, but there were problems with this theory. The new study has clarified much of the problems. Most impact basins are circular, though some are elliptical. The Borealis Basin is neither. But the new study shows that the basin was elliptical before the action of the giant volcanoes of Mars intruded. This places the impact at least 3.9 billion years ago, in order to precede the volcanoes. Borealis Basin is about 5300 miles across, about 4 times as wide as the next-biggest impact basin known, the Hellas basin on southern Mars. The impacting object must have been about 1200 miles across. The new study also found signs of a possible second, outer ring, a typical characteristic of large impact basins.

Cassini (Saturn mission) has completed its original 4-year mission (not counting the 7-year flight to Saturn) and begun a 2-year extended mission, dubbed the Cassini Equinox Mission. Spring will turn to summer on Saturn, that is, the equinox will occur next

August, during the extended mission. Science will concentrate on seasonal changes, the planet's magnetosphere, and on answering questions raised in the original mission concerning the moons Titan and Enceladus.

Starburst galaxy – Astronomers have discovered an extreme star-making machine, a very remote galaxy making new stars at the rate of 1-4 thousand per year. By comparison, our Milky Way galaxy makes about 10 new stars per year. This contradicts theories that galaxies early in the history of the Universe grew by capturing smaller nearby galaxies, since this galaxy seems to be making all its own stars. It is making stars so fast that it might make essentially all the stars it will ever have in about 50 million years, not fitting what is thought to be typical for galaxies of taking about a billion years to fully form. Galaxies making lots of stars at once are called starburst galaxies, but this newly found one is the most extreme distant starburst galaxy known. It was discovered by the Hubble Space Telescope, but has since been observed by the Subaru, Keck and Maxwell telescopes in Hawaii, the Very Large Array radiotelescope in New Mexico, and the Spitzer infrared space telescope, in order to measure the star forming rate and its distance (so far that its light took 12.3 billion years to get here). Further observations are needed to determine how typical this type of galaxy was in the early Universe. If rare, then the hierarchical model of early galaxies building up by capturing smaller galaxies will remain relatively unchanged.

Seyfert galaxies are the mildest of active galaxies, those with substantial material falling into a central supermassive black hole. Friction heats the material falling in, giving active galaxies brighter than usual nuclei. A leading theory said that Seyfert galaxies have been disturbed by close encounters with neighboring galaxies, thus stirring up their gas and sending some of it within reach of the black hole. However, with visible-light telescopes, only a small fraction of Seyferts showed any evidence of such an encounter. But new images taken with the Very Large Array (VLA) radiotelescope show the majority of them are disturbed by ongoing encounters. This was indicated by the pattern of hydrogen clouds in the galaxy. The galaxies observed were relatively nearby Seyferts that had been previously observed in visible-light. The difference in observations may be a result of radio waves penetrating obscuring material better. For comparison the VLA observed inactive galaxies and found that few were disturbed.

Milky Way mass – A new study using data from the Sloan Digital Survey has measured the motions of 2400 stars in the extended halo that surrounds our Milky Way galaxy. From this they calculated the mass of our galaxy, and came up with slightly under 1 trillion times the Sun's mass. Previous such studies, which used fewer stars and therefore should be less accurate, came up with about 2 trillion. More research needs to be done to reconcile the differences between studies.

Orion cluster – A detailed survey of stars in the cluster located within the Orion Nebula showed that about 8% have enough surrounding dust to make Jupiter-sized planets. This is consistent with results of current planet searches, which are finding Jupiter-sized planets at only about 6% of stars. But it is inconsistent with studies of other star-forming regions, such as the Taurus cluster, where more than 20% have enough dust mass to make large planets. It appears that the percentage of stars with dust changes over the life of the cluster. It may also depend on the density of stars in the cluster. More clusters with more variety need to be observed to determine which is the rule and which the exception. The Orion study was made with the newly assembled CARMA array of millimeter wavelength telescopes, located above Owens Valley California, and the Submillimeter Array in Hawaii.

Star cluster puzzle – NGC 6791, an open cluster of over 10,000 stars in Lyra, has been found to have stars of 3 different ages: 4, 6 and 8 billion years. Astronomers generally believe that all stars in any given open cluster form at essentially the same time, so this cluster presented a puzzle. Half of the mystery has apparently been solved. It was calculated that a binary white dwarf star of age 6 billion years, when mistaken for a single star, would have its age measured erroneously as 4 billion years. This is because the brightness of a star is used in the age calculation, and the brightness of a binary would be twice as bright as either component. Due to the distance to this cluster, it is likely that many binary stars cannot be resolved, and so would be mistaken for single stars. The difference between 6 and 8 billion year old stars remains to be resolved. The only clue so far is that the white dwarf stars all appear to be the younger age.

Non-identical twins – A pair of eclipsing stars orbiting each other in the Orion Nebula has been studied and found to have identical masses: 41% that of our Sun. The mass and chemical composition of any star should entirely determine its life history, so these 2 stars, forming from the same cloud and therefore having identical composition, should remain identical throughout their lives. Yet they differ in brightness, surface temperature, and possibly size. If they were not the components of a binary star, astronomers would assume different ages to explain the differences. Further observations are needed to determine if one star really is older or if something has disturbed the evolution of one of the stars.

Rosetta (European comet mission) has been awakened from sleep mode to prepare for its encounter with asteroid 2867 Steins on September 5, at a distance of only 500 miles. Steins is a relatively rare type of asteroid, classified as E-type, composed mainly of silicates and basalts. Observations of Steins will include studying its physical and chemical properties, its rotation, its interaction with the solar wind, and magnetic and electrical properties around it. Search will also be conducted for possible satellites and surrounding gas or dust. The spacecraft was launched in 2004 and will reach Comet Churyumov-Gerasimenko in 2014. It has made 3 gravity slingshot passes, 2 by Earth and 1 by Mars, and will make another by Earth and a flyby of another asteroid before reaching the comet.

Asteroid spin – Computer simulations of asteroids have shown that sunlight pressure can cause them to spin substantially slower or faster. This may be the source of many binary asteroids, which have been found to be fairly common. If an asteroid spins up to a certain speed, it will throw off material centrifugally from its equator, and the material will often reaccumulate into a satellite asteroid. The astronomers who did the simulation suggest that a mission to a binary asteroid would likely be able to observe or sample material that originally formed near the core, but would be uncovered by the creation of the binary *by the spin-up process, (continued on page 8)*

A Life Under The Stars

(part 2 of a 2-part series)

Lance Humphreys

The Three Great Comets

By July of 1994 I had my two observatories up and running for 5 years. The Hubble Space Telescope was up and running too, and every scope on the planet big and small was ready. Yes, the most awesome spectacle any astronomer could ever imagine: Shoemaker-Levy 9.

It was discovered just three mountain ridges away from my Anza observatory, by the team working on Palomar Mountain. Even today I can clearly recall the first evening of the first impact. It hit the back side of Jupiter just around the limb and took only a few minutes to come into view by Jupiter's rotation.

The impact site was a large, well-defined black and gray circular blotch, that had a very deep black semi circle under it, like a shock wave. From July 16th until July 21st, 1994 I sat with my 3" f/15 Unitron, a C-11, and the 17 1/2 inch dob and just marveled! I made well over 100 sketches of the impacts and their changes into August. I was totally amazed as was the entire astronomical community!

In September 2005, 10 years after SL-9 hit Jupiter I had the great honor to meet David Levy. We met under the southern skies, on the shores of Lake Titicaca, at 12,500 feet in the Bolivian Andes. There I presented him copies of over 100 detailed sketches that I made of his comet, along with all of my detailed notes and descriptions. Funny thing, when I handed the logbook and sketches to him he had on a shirt that said "My Damm Comet Crashed!"

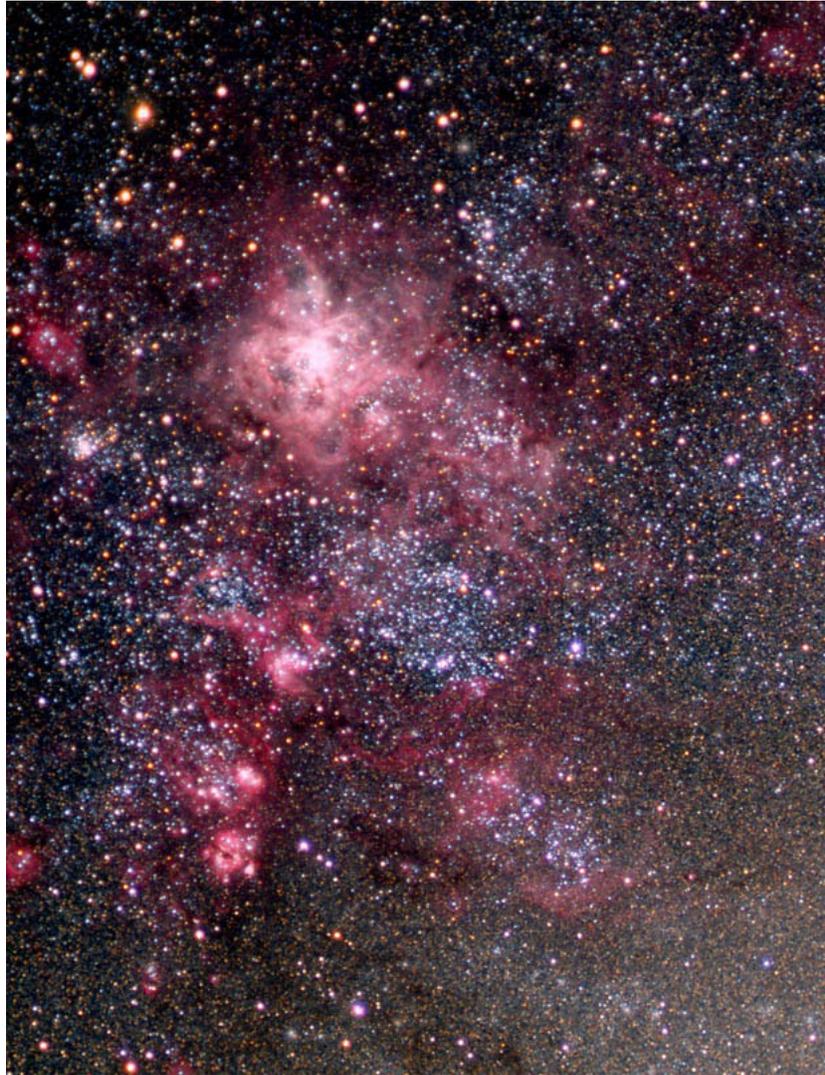
Then in Japan on January 30, 1996, an amateur using six-inch binoculars was out to check on a comet he had found in 1995. As Yuji sweep the area he found yet another comet that would later be known as the Great Comet of 1996, Comet Hyakutake 1996B2.

By March and April of 1996 this was a huge monster! Its thin tail as seen from my observatory at Anza was at times 50 degrees long! The nucleus and coma had details that I had never seen in any comet before. The jets, the hoods, the streamers off the head were mind-blowing. The sheer size of the head was two or three times the size of a full moon. Just flat out jaw-dropping!

As I sat there with this new monster comet and both its naked eye view and the image i was seeing in the 17 1/2 dob at high power, I could not help but think how truly awesome this thing was, and how in such a very very short time it had come down on us. From Jan. 30th when it was fist spotted until March only weeks later when it was LARGE, until early/mid April when it came so close to the earth it made me shudder.

Remember this is on the heels of Comet Shoemaker-Levy 9's extraordinary crash into Jupiter! My mind was totally reeling! i could easily take that image that i was looking at in the big scope and transpose that on the sky of a comet coming straight in at us. i could imagine the fear that humanity would be under. But as an amateur astronomer, sitting in his own observatory, I thought to myself, "What a spectacular way for an observer to go out!" This has been such a life long passion, I thought, what else could you do but sit back and realize that this is the best way to go. While everyone is in terror, just partake in the most awesome sight imaginable!

On July 1995 two Americans found the the Great Comet of 1996, Hale-Bopp. By March of 1996 everyone knew we had yet



The Large Magellanic Cloud (lower right) and the Tarantula N
Bolivia by Lance Humphreys, August 2005

another naked eye comet to feast on. From March through May the Great Comet was both a morning and evening object. Its tail was bright and fan-shaped with both red and green color to it. As with Hyakutake, I took many piggyback photos on the C-11 with 100-200mm telephoto lenses, and some great tripod shots with a 50mm set up with mountain ridges and pine trees in the foreground.

Again I could not help but think of how great my timing was to be in just the right place at the right time! How could I ever have known that when I took that huge step in moving away from the city, that these events would come to pass? I just wanted to leave the rat race and be with nature under the Milky Way. The way that things turned out with a comfortable observatory under great dark skies was just too much!



nebula (NGC 2070; upper left) as seen from near Lake Titicaca,

The Big 28-Inch and My Best Observation Run Ever!

After years of mining the sky with the 3", then the C-11, and finally the big 17 1/2 dob I had seen it all! Every object plotted on the Sky Atlas 2000.0 that is. You have to remember that this was before the Uranometria set came out! When the First Edition and then the even-better Second Edition came out it was time for that Bigger Scope! So I put in an order with Rick Singmaster for a 28-inch telescope. By now I had moved up from the C-11 to a C-14. Also I went to a 17 1/2-inch truss and sold the old dob. Rick personally delivered the scope and set it up in my freshly built 28 x 24 steel building with a roll-off roof.

You can see all my observatories that I built and posted about, plus the best observing run in my life! Be sure to check out my website, <http://www.anzaobservatory.com>. You can read all about my 34-day observation run with a 22" StarMaster on the shores of Lake Titicaca, Bolivia. This included seeing the hundreds of objects plotted in the Uranometria atlas, 2nd ed. For everything in both the LMC and SMC. You can also read about my epic Globular Cluster Marathon. With the help of two other hard core astronomers, in a dusk-to-dawn marathon we saw a total of 101 globular clusters and made detailed notes on all of them.

Go South!

The building boom of the late 1990s and 2000s came from all directions to my dark site. my observatory now came under assault from all directions. The towns at the bottom of the mountains turned into cities and the light pollution domes were growing. Even my once-dark rural neighborhood, where everyone knew to keep lights off for the observatory was under attack. All those friendly neighbors had been replaced by flat landers.

They came up from the city, bulldozed the entire land, pin to pin. Killing all the manzanita, red shank, sage & mountain mahogany. Then they drug up pre-fabs and bought the biggest brightest security lights they could find. These people were ruthless! They had no respect for anything but their own narrow vision of mountain living. Even my club's dark site not far from me was affected. I remember when you could see only ONE light from the OCA site.

There had always been by-laws and covenants in regard to outdoor lighting there. i mean Palomar was nearby too. But this newest migration of flatlanders without a clue were blatantly breaking the laws and respect of the locals. I tried to reason, I tried to shield the lights, I even tried to buy them off. Nothing worked.

Well, it came to the old adage: "Love it or leave it." I left it! And I'm glad I did when I did. Because if I had waited any longer, there wouldn't have been any buyers in today's market, and would have been stuck under a sky that never gets as dark as it used to.

So my 28" StarMaster, 17 1/2" dob, and C-14 are in a very dark storage container. But don't cry! I'm now ready to find a new home for all my scopes, library etc. I am committed to build the Worlds Finest Amateur Astronomy Observatory for all to use, hopefully in the Southern Hemisphere. You can see all of my old Anza Observatories that i posted earlier about, and all of the equipment that will be part of the new project, on my website, <http://www.anzaobservatory.com>. ■

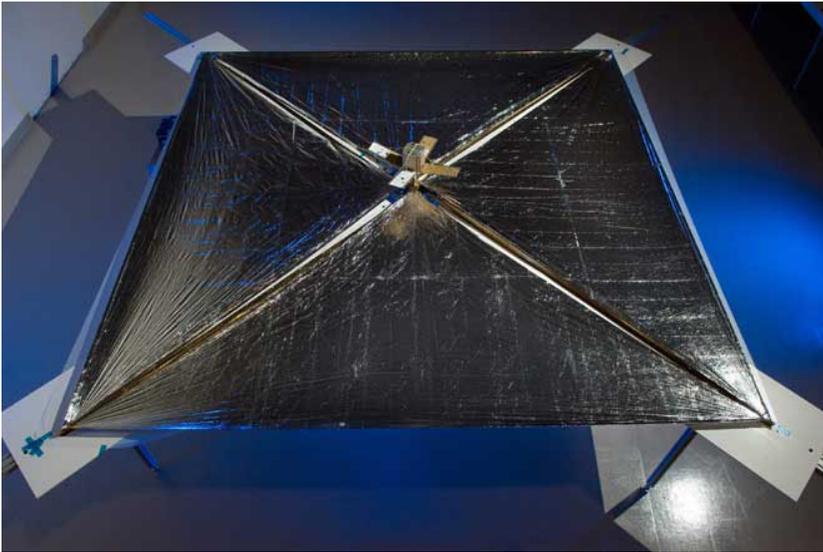
(continued from page 5)

Relativity – Study by the Byrd Green Bank radiotelescope of a pair of neutron stars orbiting each other fairly closely has been able to measure the spin axes of the neutron stars, and how they change with time. Einstein's General Relativity predicts that the spin axes should wobble, or precess. The new study showed that the wobble occurring matched the theoretical amount from General Relativity. Other gravitational theories that compete with General Relativity generally predict a different amount of wobble. The neutron stars are about 1700 light-years away, and are orbiting each other at about twice the distance of our Moon from the Earth, and take under 2.5 hours per orbit. Neutron stars are heavier than the Sun but only several miles across, resulting in extremely strong gravity, where effects of General Relativity become apparent.



Byrd Green Bank radiotelescope

Laws of physics – The ratio of the mass of the proton to that of the electron has been measured in a galaxy so distant that its light took 7.5 billion years to reach us, and found to match that measured today on earth. The measurement was made with a radiotelescope observing the spectrum of ammonia, which depends on this mass ratio. This supports the belief of many cosmologists that the laws of physics remain the same at all places and all times.



NanoSail-D (credit: NASA/MSFC/D. Higginbotham)

Solar Sail – NASA plans to launch a small (only 10 pounds) solar sail, called NanoSail-D, probably during August. Such sails use sunlight pressure to propel them. Though this produces only a fraction of an ounce at this sail size, the accumulated energy over months far exceeds what a chemical rocket can do. This will be the first functioning solar sail, though plans have been made for them since the 1980s. Notably the Planetary Society launched a solar sail in recent years, but its launch rocket failed.

Instant AstroSpace Updates

3 exceptionally luminous supernovas have been observed in recent years, including 2005gj, and one explanation proposed is that they involved the collapse of a star into a **quark star** rather than to a neutron star. Quark stars are theoretical, and may exist when neutrons in a neutron star are crushed into their component quarks.

XMM-Newton (orbiting X-ray telescope) has for the first time detected X-rays from both components of a **binary pulsar** (neutron star).

Infrared observations of Saturn have revealed a second ring of **aurora**, $\frac{1}{4}$ as bright as the previously known main aurora. The newly discovered aurora may be like Jupiter's in that it is caused by the magnetosphere directing charged particles down to the planet that were thrown off by moons.

NASA has announced the launch schedules for all remaining **Space Shuttle** flights, 1 to repair the Hubble Space Telescope and 9 to complete assembly of the International Space Station, with the last flight in May 2010. 2 contingency flights are being planned for the end of 2010 if needed.

Canada is building the world's first satellite for the dual purpose of tracking asteroids and Earth-orbiting satellites. Called **NEOSSat**, it is low cost and small (only about 140 pounds), and so can be launched piggy-back with other larger satellites.

A huge **camera** that will take images a meter (39 inches) across is being built for the Blanco 4-meter telescope in Chile. It will be used starting in 2011 to map 300 million galaxies in order to study the effects of dark energy on galaxy distribution. ■

Thanks for all the hard work, and for your enthusiasm for astronomy and for our club, Matt! We'll miss you, and hope you'll be back at least to visit now and then, and that you'll let us know what goes on with the astronomy community in your new home!

Southern California Astronomy Expo

As I mentioned last month, Oceanside Photo and Telescope had its fourth Southern California Astronomy Expo in July. I wasn't able to go for the first day, but can say from my own observation that the second day was a great success – even though I didn't win anything in the raffle (several club members did, however, and there were a lot of really great prizes!).

We had a booth there, but I didn't have a lot of time to come up with anything fancy for it. There were also booths for the San Diego Astronomical Association (SDAA) and the Riverside Astronomical Society (RAS), and one of the fun features of the day was having a chance to visit with members of those two clubs. They were on the upper level of booths and we were on the lower level, which proved to be a good thing, as both of those organizations were much better organized than we were and had great displays showing different aspects of their clubs. However, when we were headed out the door to go down to OPT for the Expo, we decided to take a portfolio of astroimage prints that Alan Smallbone put together for past AstroImage group meetings, and that proved to be a great attention-getter, especially his sequence of pictures of a rocket launch taken from Mt. Wilson a couple years ago. I'm really sorry we didn't have any prints there from our other talented imagers, as the people who came to the Expo were obviously very interested in them, both for subject matter and in learning more about how they were done. I lost track of the number of people who came up and looked through the book, asking questions about the pictures, about the equipment used and where they were taken – and, along the way, also asking a lot of questions about the club.

The lesson in this is that we need to collect a portfolio of prints from as many of our imagers as we can, to use for future events, such as the PATS conference coming up in September. One way our club stands out from the others in the area is in the level of expertise many of our imagers have, so we should showcase that area a bit when we are trying to show off our club a bit to the general public. Of course, after seeing the displays from the other clubs, I'd also like to have some pictures or other displays showcasing things like our various outreach activities, our other interest groups, and other things that make belonging to our club so worthwhile – fortunately, we have some time before the PATS conference...

Many thanks to Craig Bobchin, Sheryl Benedict and Alan for helping out with the booth all day on July 19th – it wouldn't have been nearly the success it was without your help!

Carpooling to Anza

With the skyrocketing gas prices, it's not surprising that more people are expressing interest in carpooling to get out to Anza for star parties and other events. As a club, we don't have a way of matching people up with potential partners for carpooling purposes. In general, people who carpool to Anza have been doing that on an informal basis, by private arrangement.

My best suggestion for people who have not been able to find someone to team up with on a carpool arrangement is to put an e-mail out on our two main e-mail groups, OCAstronomers@Yahoogroups.com and AstroImagers@Yahoogroups.com, inquiring about whether anyone is interested in carpooling. It would be best to keep personal information off of the email groups, as we can't insure that it would remain private – the details of any carpooling arrangements would most safely be made between individual members off-line, after initial contact through the email groups. If anyone has a suggestion for what could be done to make it easier for people to form carpools, please let me know. In particular, if you are interested in organizing such a service for the club, that would be extremely helpful, as I don't believe that anyone on the board or any of our regular volunteers has additional time and energy that they could devote to such a project.

Most people who go out to Anza take equipment of some sort with them, as well as whatever else they feel they might need to have a comfortable stay while out there; the more a person brings, the harder it is to arrange for a carpool. One idea I have thought about in the past that might make even more sense now is to provide some sort of storage at the Anza site for people who don't have observatories or storage associated with a pad. How this might be done in a way that would balance the security of individual members with the needs and interests of the club is unclear, but, if there is interest among the members who use the site regularly in having storage of that type, we could certainly explore the options. Please let me know if this is something that would be of interest to you – it would be best to do that by e-mail to btoy@cox.net, so I can keep track of responses more easily. Please include any comments you have about the kind of storage you think would be useful and any ideas you have for how we could provide this.

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 separately or as a package for \$300.00. Contact Doug 562-598-6103



Jupiter as imaged by Hassi Norlen using a Meade 6-inch LXD-75 from Blackstar Canyon, June 28, 2008

Bill Hall created this image of M27 from Yorba Linda, California using a 4-inch f/6.95 SV102ED refractor



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:

	Club Rate	Regular Rate
Sky & Telescope*	\$33.00	\$42.95
ASTRONOMY	\$34.00	\$42.95

***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 10th**. 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.



The California Nebula as imaged by Garth Buckles from Anza on December 31, 2007

Nonprofit Organization
 U.S. Postage
PAID
 Santa Ana, CA
 Permit No. 1468

**NEWSLETTER OF THE
 ORANGE COUNTY ASTRONOMERS
 P.O. BOX 1762
 COSTA MESA, CA 92628**

RETURN SERVICE REQUESTED

**DATED MATERIAL
 DELIVER PROMPTLY**

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@ccd.edu	714-751-5381
Secretary	Bob Buchheim	rbuchheim@earthlink.net	949-459-7622
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 Librarian	Richard Cranston	rcransto@ix.netcom.com	714-893-8659
Membership, Pad Coordinator	Karen Schnabel	karen@schnabel.net	949-887-9517
Observatory Custodian/Trainer/Member Liaison	Charlie Oostdyk	charlie@ccd.edu	714-751-5381
OCA Outreach Coordinator	Barbara Toy	btoy@cox.net	714-606-1825
Sirius Astronomer Editor	Jim Benet	jimbenet@pacbell.net	714-693-1639
Telescope Loaner Program	Steve Condrey	stevecondrey@verizon.net	951-678-0189
WAA Representative	Mike Myers	loanerscopes@twow.com	714-240-8458
Website Coordinator	Tim Hogle	TimHogle@aol.com	626-357-7770
Website Editor	Rob Carr	RCCarr1@excite.com	909-606-1241
	Hassi Norlén	hassi@norlens.net	714-710-9444

SPECIAL INTEREST GROUPS (SIG's)

Astrolmagers 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