



Scaled Composites, Inc.'s SpaceShipOne lands after winning the Ansari X-Prize on October 4. The small spacecraft made its second trip to space under the guidance of pilot Brian Binnie to an altitude of more than 73 miles at Mach 3.2, qualifying for the prize. Airline mogul Richard Branson has announced plans to begin commercial flights to space in 2007, but at an estimated \$180,000 per ticket, your backyard telescope is for the time being a far better bargain for reaching the stars! (photo courtesy John Sanford)

OCA CLUB MEETING

The free and open club meeting will be held Friday, November 12th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. The featured speaker this month is Shelley Bonus, who will share with us the fascinating mythology of the constellations!

STAR PARTIES

The Black Star Canyon site will be open this month on November 6th. The Anza site will be open November 13th. 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 November 5th (and next month on December 3rd) at the Centennial Heritage Museum (formerly the Discovery Museum of Orange County) at 3101 West Harvard Street in Santa Ana.

GOTO SIG: TBA (contact coordinator for details)

Astro-Imagers SIG: Nov. 16th, Dec. 21st

EOA SIG: Nov. 22nd, Dec. 27th

Astrophysics SIG: Nov. 19th, Dec 17th

President's Message

By Barbara Toy

By the time you read this, we'll be off Daylight Savings Time – and maybe the rainy season will have begun...I've been told that this is supposed to be a wet winter. Well, we need the water, but here's hoping the storms all cluster around the full moon!

Fundraising for Anza

Elsewhere in this issue you should see an announcement about our fundraising effort for work out at our Anza site. This particular plan is based on the fact that just about everyone has at least a few things that are never used, but are too good to throw away, and because we don't quite know what to do with them, they just hang around taking up space. For a lot of people, it's easier to donate something physical and take a tax deduction for its value than it is to donate cash – especially if it's something that's not being used and maybe is even in the way. These could include “collectables” or artwork that aren't quite your taste, a TV or stereo or other electronic equipment that's been replaced by something better, tools or sporting equipment you don't use anymore, a set of china that isn't your style, jewelry you never wear – once you start thinking about it, I'm sure you could add a lot of possibles to the list.

Our “win-win” fundraising idea is that we give you an easy way to get rid of these things by donating them to the club, which gets them out of your hair and gives you a tax deduction as well, and the club then raises the money it needs from them by auctioning them on Ebay. Actually, the idea that the club would itself auction off a lot of different things on Ebay is pretty daunting, as it would require a lot of administrative work to make it work, not least of which is making sure the money actually arrives and that everything that's sold is properly delivered to the purchaser.

One of our members, Larry McManus, has a company that auctions items on Ebay as a major part of its business, and we have an agreement with him to have the company handle all of that heavy work for us, for a percentage that covers the costs associated with the process and gives them some compensation for their time and expertise. The arrangement also gives them incentive to get as good a price for the items sold as they can, as that's to their benefit, too. Larry has generously volunteered his time and energy to handle the remaining aspects of the project that are still the club's responsibility, such as publicizing the project, collecting the donated items from members (or anyone else who wants to donate – we won't insist that donors be members!), providing receipts for the donations, delivering them to the company, monitoring what happens with them, and making sure we get a proper accounting along with our portion of the proceeds of the sales. It's the combination of Larry's volunteer efforts and the expertise and administrative work provided by the company that makes this idea really workable for us.

So, why do we need to raise this money? One big reason is that the fire in June left us fenceless and defenseless along two sides of our Anza property – and just the materials for the fence will be expensive, even though we're only planning on three-strand barbed wire strung on metal poles. For those who may not be aware of the metals markets, the cost of steel has been skyrocketing, and isn't expected to come down or even slow down much in the near future, so our expected costs for the fence are rising, even though we hope to provide most of the labor through the help of volunteers. This problem with the metals market affects one of our other big needs, as well – the replacement roof for the observatory.

The roll-off roof for the club observatory has seen over twenty years of hard use and harsh Anza weather, and badly needs either major renovation work or replacement. It's a very heavy structure, and there's a stronger, lighter and much more easily maintained alternative available now – a metal roll-off roof, similar to what Dave Radosevich, Jim Hannum and John Kerns built for their observatory. After considering the options, it was pretty clear to the Board that replacing the current roof with a metal structure was by far the better option, especially as we think it can be built to allow more clearance than the current roof, so we could actually move the Kuhn around without having to open the roof. This would make it a lot easier to do repairs or maintenance on the telescope, and could also allow us to close the roof even if, for some reason, we aren't able to get the Kuhn into its proper “park” position. Not incidentally, it would also make it a lot easier to close the roof without the chain drive if we had a power loss or the motor died while the roof was open – a very attractive feature to those of us who have the roof open a lot!

Another significant expense that's come up more recently is our network with broadband access to the Internet for the Anza site. Members who've used this are mostly familiar with accessing it as a wireless network. We also have several hardwired locations on the network, including the computer that controls the Kuhn telescope and the computer that uploads the weatherstation and weathercam data to the club website. We had a thunderstorm in the vicinity that damaged a lot of components in the system, which is why you may have noticed that the weather information displayed on the website for Anza stayed on August 14 for weeks afterward (I'm hoping that'll be corrected by the time you read this...). Vance Tyree has taken on responsibility for the system, and he and others with expertise in the area (including Jerry Mulchin, who did the original installation) have

concluded that we need to replace the current network backbone with fiber optic cable as a major step toward eliminating the problems we were having with the system even before the thunderstorm. We'll need to replace damaged components, as well, and to ground portions of the system better – all of which, of course, is additional expense.

I think anyone who's spent much time out at Anza has come up with ideas on things that could be done to improve the site. A concrete walkway or stairs between Anza House and the Football Field is a popular suggestion, modifying the westernmost bathroom in Anza House to allow access directly from the hallway is another, and there are many more. It would be really great if this fundraiser raised enough money that we could fund some of these "wish list" items as well as the really urgent projects. If we don't come up with enough new funding to pay for at least the urgent projects, we will have to find another way to pay for them. There *are* other ways – but none of them are as relatively painless as this Ebay idea.

So, please, do check your closets, storage units, garages, attics and anyplace else you store things you don't use, and donate any salable items you don't need to the club. As Larry said at the October general meeting, we're asking each of you to donate one item – but we'll be delighted if you want to donate more than that!

We're collecting items for this fundraiser for at least the next three general meetings. If you have something that you'd like to donate but you can't get it to one of the meetings, we'll be happy to make arrangements to pick it up. The person to contact is Larry McManus, who can be reached at lmcmamus@clearpointadv.com or at 714/731-5542. Thanks for your help!

OCA Elections

Given the highly-charged political climate as we approach the national and local elections in November (which should be over by the time you see this), you may not want to be reminded that the club is entering its own election season – but we like to think that our elections are a lot more fun. We take nominations from the floor of the general meetings in November and December, ballots should be available to download from website sometime between the December meeting the end of the month, and will also be sent with the January Sirius Astronomer and will be available at the January meeting. You can vote by mail (directions will be on the ballot, which, as is our practice, won't feature any chads, hanging or otherwise) or at the January general meeting. To be counted, your ballot has to be postmarked on or before the day of the January general meeting (i.e. January 14, 2005), or has to be turned in at the general meeting itself.

The purpose of the election is to select the new Board of Trustees, which governs the club. There are eleven Trustees on the Board, including four officers, and all eleven positions are up for election every year. The qualifications are pretty easy to meet: anyone who's been a member of the club for a year can run for a general Trustee position, and any member who's served on the Board for a year (*any* year) can run for President or Vice President. The current Board members are listed on the contact list on the back of the Sirius Astronomer and on the Contacts page on the club website.

As I've said on other occasions, being a Board member is a great way to get more involved with the club as well as to learn more about it than you could believe possible. Historically, our Boards have been very active, so pretty much everything significant that goes on in the club goes past the Board in one way or another – and (at least with the current Board) there are very few club activities that one or another of the Board members isn't directly involved in. There's always a lot going on in the club, and our meetings (which are regularly scheduled in the odd-numbered months of the year) are seldom boring. The Board is essentially the nerve center of the club, and Board members legitimately learn about and can participate in a lot of things that they never would have known about otherwise. And, though it may run against popular wisdom to say this, being on the Board can simply be fun.

Those are all ways you could benefit personally by serving on the Board. The benefit to the club of having you run for the Board, of course, is that it helps give the members a real choice as they decide who to vote for, and it could help bring a different perspective and a different skill set into the club leadership. As I write this, I don't know who on the current Board will be running for another term and who may decide not to. Regardless of the plans of the current Board members, you should run – to help keep your club healthy. And please don't be discouraged if you lose the first time you run – your only cost for running would be a little time (mainly, to write a statement that we can put on the website, etc., to let people know more about you and your candidacy) and several of our members had to run more than once before actually making it onto the Board (and we are very glad they did!).

To all you past Board members out there – we really appreciate all your past services to the club, which helped it become the great organization it is today (and for those past Board members who continue to serve the club in non-elected positions – Don Lynn, Jim Benet, Liam Kennedy and Russell Sipe are some who come to mind – thank you for all of your ongoing efforts!). Do consider rejoining the Board – we could really benefit from your knowledge and expertise – and, of course, as past Board members, you would qualify to run for President or Vice President, both of which (I say this from personal experience) are very stimulating and at times entertaining positions to occupy. (continued on page 10)

ASTROSPACE UPDATE

November 2004

Gathered by Don Lynn from NASA and other sources

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

Mars Express (European Mars orbiter) – In May this column reported that Mars Express had found methane in Mars' atmosphere, but the source of it was a mystery because Mars appears to lack the 2 large sources of methane that the Earth has (life and active volcanoes). Mars Express has now measured where on Mars the highest concentrations of methane occur, and they are 3 broad equatorial regions: Arabia Terra, Elysium Planum and Arcadia-Memnonia. These same regions have higher concentrations of water vapor near the surface, and are regions where Mars Odyssey has detected water ice deposits a few feet below the surface. The best guess is that some geothermal source under these ice deposits is causing evaporation of the ice and is freeing contained gases such as methane. The question still remains whether the methane originally came from volcanic action or life under the ice. More investigation is needed to understand these findings.

Mars Express also measured the inflow of particles (from solar wind) to the Martian atmosphere and the outflow of particles to measure how effectively the solar wind is stripping away molecules of the atmosphere. The observations showed that the solar wind penetrated to as low as 168 miles altitude. This is probably far enough for the solar wind to have stripped most of Mars' water vapor over billions of years. This supports the theory that solar wind stripping caused Mars to **lose the water** and thicker atmosphere implied by the residue on the surface of floods that appear to have occurred in the distant past.

Early Galaxies – Detailed analysis of the Hubble Ultra Deep Field image has identified many of the earliest forming galaxies ever seen, so distant that we are seeing them as they were when the light left them 95% of the way back in time to the Big Bang. At that time it appears the Universe was filled with dwarf galaxies, none as large as the sizable galaxies we see today. This supports the theory that large galaxies were formed by merging of small galaxies. One study of these dwarf galaxies in the Ultra Deep Field claims that the light, particularly ultraviolet, from these was not sufficient to ionize the clouds of gas around the galaxies. But it is known from other observations that most gas clouds became ionized by that time in the history of the Universe. It is possible that dwarf galaxies at that time produced more ultraviolet than they do today, or that galaxies earlier than seen in the Ultra Deep Field did the ionization, or that there were far more very dim galaxies than the ones that were detected in the Ultra Deep Field, so many that their combined light was sufficient to ionize most gas clouds. Further study is needed to answer this.

Study of the Ultra Deep Field also located a **sheet of galaxies** at a look-back time of 91% of the way to the Big Bang. This shows that the structure of the Universe found today, where major galaxy clusters are found in sheets, was already present back then.

Cassini (Saturn mission) has successfully completed the next-to-last planned test of its lander Huygens before dropping it in December, to land a few weeks later on the moon Titan. Cassini also took relatively good images of the moon Prometheus, which shepherds the inside edge of the F ring. Through gravitational interaction, the moon herds particles that are leaving the ring back into the ring, preserving its size and shape long beyond what would occur without the shepherd moon in a nearby orbit. These images showed the moon's irregular shape clearly. It was expected to be non-spherical, as most small moons are, and these images confirmed that. It is 63 miles across the longest direction. Even better images are planned on a future orbit that brings it closer to Prometheus.

Mars Rovers Spirit & Opportunity have completed their 5 month extended missions (beyond the original 3 month missions), and have been extended (funded) for another 6 months, or until they stop functioning. They have been exploring Mars for about 3 times their original projected life of 90 Martian days. Both were working fairly well when contact was re-established after they (and Mars) came from behind the Sun in September. The controller team will work only 5 days a week until the end of the year, then return to 7-day weeks. This is because the Sun being lower in the Martian sky during the next few months (winter there) means that the rovers will spend about 2 days a week recharging their batteries from the solar panels, without running any substantial energy-draining experiments. When the Sun appears higher in the sky, starting about January, the solar panels produce more power and 7-day science weeks can resume.

The more the rovers have looked, the more evidence they find of past liquid water on Mars. **Opportunity** is examining a rock called Escher (because it is covered with fitted polygon shapes, like some of Escher's artwork) near the bottom of Endurance Crater, and next will be looking at a lumpy boulder named Wopmay, then at Burns Cliff, where many layers of rock are exposed in one place. After that the plan is to climb out of the crater and head for the place the rover's heat shield landed.

Spirit experienced a problem with the steering motors on 2 of its wheels (right-front and left-rear). Controllers believe they can still drive on up the Columbia Hills to continue exploration, although perhaps more slowly. Spirit has not found a single volcanic rock without alteration by water since it started climbing the Columbia Hills. This demonstrates how pervasive water was before or during the formation of the hills.

Martian ocean – One of the reasons that many astronomers doubt the theory that Mars had an ocean in the past is that oceans on Earth produce large amounts of carbonate minerals, but Mars has only small amounts of such carbonates. Based on the Mars rovers' findings of large amounts of sulfates and iron compounds, a new theory has been proposed that the sulfates and iron compounds made Mars' ancient ocean too acidic to allow carbonates to form.

Mars Global Surveyor – Spacecraft controllers for Mars Global Surveyor have developed a new technique for imaging through the high-resolution camera that involves rolling the attitude of the spacecraft during imaging so that it results in up to 3 times the resolution previously obtained in images, at least in one direction. One of the first uses of the technique was to image the area where the Mars rover Spirit landed. It not only easily showed the rover, which was barely resolved in previous attempts, it also showed the tracks left in the Martian soil by the wheels of the rover. Another application of the technique was to try to find the largest boulders within the ripples of soil left by a past catastrophic flood. The boulders were still too small to resolve, but the observation does set an upper limit to that size, and therefore an upper limit to the force of the floodwaters. Global Surveyor was given another mission extension in late September because it is still producing great scientific results after 7 years in orbit about the red planet and 170,000 images returned.

Chandra (X-ray observatory) has made the first detailed image of how high-energy particles behave around a fast-moving pulsar. It shows a shock wave created as the pulsar plows supersonically through the material in interstellar space. The pulsar is moving about 1.3 million mph and is leaving a trail glowing in X-rays that is 4 light-years long. The pulsar and its trail were known from radiotelescope observations, and have been named the Mouse because of its shape in radio light.

Galaxy Collisions – An analysis of Hubble Space Telescope data about a group of galaxies shows that the Universe has experienced only about one tenth the collisions of galaxies than previously thought. The previous estimates of collisions had been based on the fact that large galaxies are largely devoid of stars at their cores, and it was thought that it took several galaxy collisions to complete such a clearing of stars. However the new study showed that a single collision can clear almost all the stars from a galaxy's core.

Mira Stars – A team of astronomers has used interferometry with an array of infrared telescopes in Arizona to observe 5 Mira-type variable stars and their surroundings, and has found that they are surrounded by a shell of water vapor about twice the size of the star. This solves a mystery because theory predicted about half the size that had been measured for Mira stars. The problem was that previous work measured the shell, not the star, since they were done in wavelengths that did not penetrate the shell. Of course this raises a new mystery: Atmospheric pressure of the star is not enough to support a shell of the density and height measured. The best guess is that something about the star's pulsations supplies the additional pressure needed. Stars about the size of our Sun near the end of their lives swell up and begin pulsating to become Mira-type stars.

Bare core of a star – Astronomers using the Gemini North and Keck II telescopes, both in Hawaii, believe they have found the bare core of a star that has been stripped of all its outer layers by the gravitational force of its companion star. The binary pair is known as EF Eridanus and is a magnetic cataclysmic variable star system. They orbit about each other in only 81 minutes since they are so close together (about the distance the Moon is from us). The star is too massive (1/20 that of the Sun) to be a planet, has the wrong spectrum to be a brown dwarf, and too low a mass to be a normal star. Its diameter is roughly that of Jupiter, but is far more massive. Its temperature is about 1700 degrees K. The observations were difficult because highly magnetic stars such as these (14 million times the magnetic field of our Sun) produce great amounts of cyclotron infrared radiation that had to be sorted out from the stars' light.

Gamma rays – Using an array of 4 gamma-ray telescopes in Namibia, astronomers have discovered a source near the center of our Milky Way galaxy that radiates high-energy gamma rays. The characteristics of the gamma rays do not however match those usually seen from a black hole, so the supermassive black hole known to be at the center of the Milky Way is probably not the source. It better matches that of a supernova remnant. Previous observations by other gamma-ray telescopes of this area have not seen this type of signal, but it is not known if that indicates the signal is new or was just beyond previous sensitivity. More observation will be done to try to answer the questions raised.

XMM-Newton (European X-ray telescope) has captured an image of a cluster of about 300 galaxies colliding with a cluster of about 1000 galaxies, and merging into one large cluster. This is one of the most powerful events ever seen. There is generally more mass in the gas about a galaxy cluster than there is mass in the galaxies themselves. These clouds of gas about the 2 galaxy clusters during the collision caused shock waves and heating of the gas to

(cont'd on page 8)

SpaceShipOne: An Eyewitness Account

by John Sanford

History was made over the last 2 weeks as the Mojave Aerospace Team won the Ansari X Prize of \$10,000,000. I was lucky to receive a press credential to be there and cover the story for my photo agency, Science Photo Library, in London. It was exciting for me since I had only taught photography for the last 30 years (before 1998 retirement that is -) and not practiced it as a working photojournalist, something I had ambitions to be back in my youth.

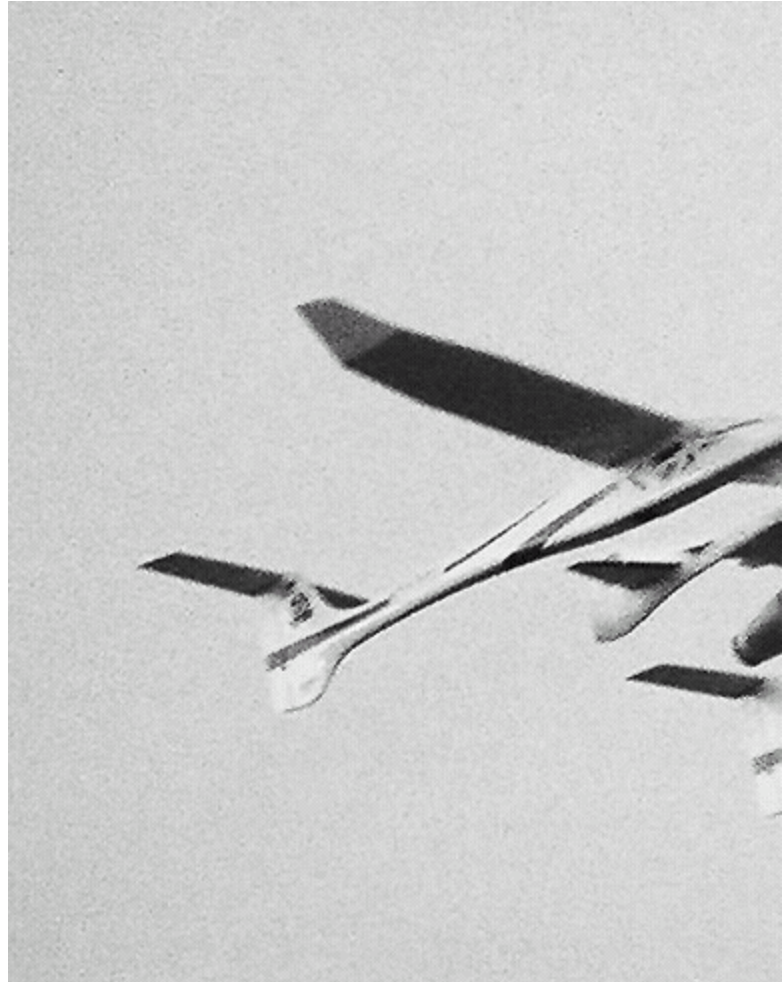
There were two flights required to win the prize. Both had to achieve at least 100km (62.5mi) and carrying the weight of three persons. The two flights had to take place within a 10 day period as well.

My first experience was as a civilian onlooker last June 29th, when a preliminary flight was made as proof of concept. For that one there were perhaps 15,000 people on hand, and I learned that the view would be much better from the media area which was closer to the flight line at the Mojave Airport, site of all the flights. So I checked with SPL and they agreed to back me up in applying for a press credential for the X Prize flights in late September. The credentialing was handled by a PR firm for the X Prize sponsors, the Ansari Foundation, called CarryOn out of Los Angeles. They were friendly and I had no problem receiving the press pass to the first prize flight on September 29th.

For technical reasons, the flights took place early in the morning, probably something to do with the prevailing strong westerly winds that develop in the western Mojave almost year-round. Anyway, After a largely sleepless evening, My friend Edie Zorn and I found our way to the breakfast given to the media by the sponsors. A pretty scruffy looking bunch of reporters and photographers were eating a decent breakfast of eggs, sausage and cornflakes, and coffee of course, in one of two buildings given over to press coverage. By 5 am, we were ready to go outside, and fortunately the wind had died down to practically nothing and it was several degrees warmer than it had been in June at that hour. I went to the press area next to the runway and joined a hundred or so media people who were setting up cameras and pavilion tents for their live shots (mostly television). There were a few still photographers like myself with a variety of cameras and lenses all the way from little digital poppers to cameras attached to a Celestron C-8.

The sun had come up much earlier in June, and there was plenty of light, but now , in late September, it was still twilight when the three chase aircraft rolled out of the Scaled Composites hanger and down the runway for takeoff. The White Knight, a specially built Rutan design carries the SpaceShipOne rocket plane under its belly, climbs to about 50,000 feet and drops it, like the X-15, whereupon the pilot fires its rocket engine to boost the speed to about Mach 3.5 and altitude to perhaps 150,000 feet, whereupon it coasts up the remainder of the altitude to the 63 mile level, a bell curve shaped trajectory, and then the plane reenters and coasts in to a dead stick landing like the Shuttle. The takeoff took place just after sunrise, they climbed out for almost an hour, and then the short rocket flight took place, taking less than 45 minutes from release to landing. The White Knight and its chase plane, a twin turbine Starship executive speedster, are visible for almost the whole climb phase, making huge circles or a figure 8 above the airport, getting smaller and smaller until only tiny white dots visible at certain angles to the sun as they approach the release altitude. Short radio transmissions are mostly unintelligible rebroadcast over the large p.a. system set up in front of the media and public areas adjoining.

After a brief directional brief, the countdown to launch comes over the speakers. We look into the bright sun, now 15 degrees or so up, and there it is! The rocket firing leaves an almost white thin smoke trail which accelerates notably during the 15 or 20 seconds of burn, until *branchloss*, a term you don't hear much anymore ("burnout"). The invisible craft is not hurtling upwards at close to 4000 miles an hour now. Pilot Mike Melville makes terse unintelligible comments over the speakers, and then



a relieved announcer says that the plane is now coasting back earthwards after reaching its desired altitude. We don't hear until several hours later that the flight path had deviated about 22 miles from its planned path due to some anomalies with the flight control system. They were apparently handled by the pilot and never really presented a danger to the success of the flight.

The little ship and its chase planes appear coming from the south and make a large circle over the *spaceport* losing altitude rapidly and lining up for the dead stick landing. My camera with motor drive had dead batteries, and I used my trusty ancient Nikon F with 300mm lens to capture the landing shot shown here.

One of the high points of the second flight, which was very similar to the first, took place the day before, on October 3rd. While reconnoitering the media bleachers, I ran into two men and a woman who were talking knowledgeably about NASA and space flight in general. I find out after joining the conversation that they are no less than David Niven and Jerry Pournelle, my favorite science fiction authors! (*Lucifer's Hammer*, *Ringworld*, *Mote in God's Eye*, etc.) They are a Mutt and Jeff pair, with Niven being quiet and shy, and Pournelle loud, opinionated and blunt.

It turns out that both have family in the Springville area, and of course, the village appears prominently in *Lucifer's Hammer*. We even have some mutual acquaintances up here!

The second flight for the X Prize was naturally covered by more press than the first. All the big networks have satellite trucks, and many recognizable figures are getting ready for their live shots with the scrim sunshields and fill in lights burning brightly. This time I was determined to get a different shot than all the rest of the media, so I'm parked outside the airport near the end of the runway White Knight will use for takeoff. On a dirt road with a few observers, I sit and wait, watching the planes roll out a couple of miles away on the airport. It was still only twilight, as the sun only broke the horizon a few seconds *after* the planes flew over, making photography difficult. I did get a shot and then drove back to the media area to await the rocket firing and landing. While the little white dots gained altitude, I was busy photographing Rudi Baktiar of CNN, who was visiting Miles O'Brien and the other CNN types set up in their media pavilion. What a beautiful woman, and very petit, only about 5' tall, beautifully dressed and the center of male attention as might be guessed. She was visiting and not scheduled to be on the air with Miles.

The flight seemed more rapid and business-like this time, and near the rocket firing time, one of the chase planes made a smoke trail so it was much easier to spot the largely invisible aircraft from the ground. Countdown came and there was the smoke trail! This time the pilot, Brian Binnie could be heard on the radio making a few comments after burnout. While Melville had released some M and M candies to float around the cockpit in his 3 minutes or so of weightless travel, Binnie was taking photos out the little windows of the cockpit. The flight was technically perfect, and this time the upgraded rocket engine

was fired a little longer, so the altitude and speed records set by the X-15 were exceeded by SpaceShipOne.

The little ship that could landed after a shorter glide down this time, and was towed to the VIP area where sponsors and Scaled Composites people were waiting. After reviewing the flight data and a short rest, the inevitable news conference took place in a small auditorium jammed with media. The photogs got to sit or kneel on the floor in front of the table where sat major sponsor Paul Allen, Burt Rutan, Binnie, Dr. Peter Diamandis and Anousheh Ansari of the foundation, the FAA Administrator Marion Blakey and several other judges and officials. Sir Richard Branson, of Virgin Galactic announced plans to fly paying passengers in a new Rutan vehicle in the early design stages as early as 2006. The Ansari Foundation will continue to sponsor a new rotating prize called the Ansari Cup, which will have new goals for continuing civilian space exploration.

I drove home later that day, had my film developed at Long's and sent my best photos over to England where they will be distributed world-wide by SPL. It was some effort, after cruising through retirement the last 6 years, but worth every minute and mile on the old Caravan. (*copyright John Sanford 2004*)

(cont'd from page 5)

very high temperatures, and it is this hot gas that emits the X-rays observed. Since these particular clusters are relatively nearby, we are seeing X-rays that left there only 800 million years ago, fairly recently in terms of the age of the Universe.

Spitzer (Infrared Space Telescope) has discovered a new globular cluster in the constellation Aquila, which is too obscured by dust to see in visible light. Follow-up observations by the University of Wyoming infrared telescope showed that it is about 9,000 light-years away and contains the mass of 300,000 Suns. It was found later in archived images from the 2-MASS infrared survey, but it had not been noticed. There are about 150 globular clusters known to orbit our Milky Way, and it was thought we had found all of them.

AST/RO (Antarctic Submillimeter Telescope and Remote Observatory, located at the South Pole) has discovered a ring of material about the center of our Milky Way galaxy, which collects over millions of years due to the gravitational action of the galaxy's bar, and periodically drops a huge amount of material (about 30 million times the Sun's mass) into the center. This causes a furious burst of star formation near the galaxy center about every 20 million years, followed by a rash of supernovas. These periodic series of supernova blasts probably make it impossible for life to have formed on any planets that might be near the center of our galaxy or any similar one.

Supernova alert – The HETE-2 spacecraft detected during September 3 bursts of X-rays from different parts of the sky that are thought to be precursors to the type of supernovas that should produce gamma-ray bursts. Astronomers have been put on alert to watch for supernovas or gamma-ray bursts from these areas. The last of the 3 X-ray bursts had some characteristics of a gamma-ray burst, but was much weaker, and may represent a newly discovered phenomenon. Some astronomers believe that X-ray bursts are not related to gamma-ray bursts, so observing that the predicted supernovas or gamma-ray burst happen or don't should help settle this issue. If a predicted gamma-ray burst does happen, it would be the closest one to Earth ever observed, since X-ray bursts in general are known to be that close.

Genesis (solar wind sample mission) – The Genesis team completed retrieval and labeling of all samples from the spacecraft that crash landed in September. Scientists are optimistic that all or nearly all science objectives can be completed even though many of the samples broke and/or were contaminated on impact. Many of the solar wind samples were collected on glass-like wafers about 4 inches across, and these mostly broke, but surprisingly they often remained in fairly large pieces. 3 of the 4 solar wind concentrators were unbroken. They hold the samples for the highest priority experiment, that of measuring oxygen isotopes in the solar wind. Different theories of exactly how the Solar system formed predict different amounts of oxygen isotopes. The samples collected on flexible foils withstood the crash best, although the frames holding the foils bent or broke. The samples were then packed and shipped to the Lunar and Planetary Laboratory in Houston, where first the sample quantity and quality will be assessed, and then the science will begin. The first samples were received in Houston the first week of October.

Best seeing – Astronomical seeing is measured by how small an image of a star can be produced in spite of our atmosphere's tendency to jitter and enlarge the image. Recent seeing tests on a high point (called Dome C) on the Antarctic Plateau, quite some distance from the South Pole, has produced images about 3 times smaller than those typically seen in what were thought to be the places with the best seeing in the world, Mauna Kea in Hawaii and the desert mountains of northern Chile. It is also high and dry enough to do infrared astronomy. The astronomers who did the seeing test are proposing that the next large telescope should be built at Dome C.

SpaceShipOne, the first non-government vehicle to take its pilot into space, has now been there 3 times. The last 2 trips qualified it to win the \$10 million Ansari X-Prize, an award to any private vehicle to make it into space twice in 2 weeks, carrying a pilot and 2 passengers (or the equivalent weight of passengers). At least 2 other groups had planned to make their first flights for the prize in October, but were soundly beaten by SpaceShipOne. The second flight reached over 70 miles, breaking the altitude record for an airplane set in 1963 by the X-15 rocket plane. The pilots of the 2 flights, Mike Melvill and Brian Binnie, became the first pilots to earn their astronaut's wings in a non-government vehicle, and the only ones earned in an airplane other than a few X-15 pilots. Burt Rutan, the designer of SpaceShipOne, plans to pursue commercial passenger service into space, and eventually into orbit, using similar but larger vehicles. Space is considered to begin at altitude 100 kilometers (62 miles).

International Space Station - The crew has repaired its oxygen generator. Expedition 10 (Leroy Chiao and Salizhan Sharipov) launched in a Russian Soyuz spacecraft October 13 for a crew exchange, planning to stay 6 months. That will bring them down almost a month before the planned return to flight of the Space Shuttles, so the next crew will also launch by Soyuz. A fair amount of their assignment is to prepare the station to receive Shuttles again. This is the 4th crew to launch since the Shuttles were grounded. Accompanying them was Yuri Shargin, who will return with the old crew by the time you read this. The station has been permanently occupied since November 2000. This is the first Soyuz to fly without a cosmonaut with experience flying a Russian vehicle. Chiao and Sharipov have flown only in the Shuttle, and Shargin is making his first trip to space. Expedition 10 is scheduled to perform 2 spacewalks, to install and retrieve outside experiments and to outfit the station to receive European cargo ships, which are scheduled to begin service to the station next October.

WEBSITE EDITOR NEEDED!

The OCA website is a major source of information for club members and for people outside the club who want to know more about us and about our hobby. Our Website Editor plays a central role in keeping all of us informed and in shaping how the rest of the world sees us – this is the person with overall responsibility for the “content” side of the website.

We need someone to take this vital position over from Russ Sipe, our current Website Editor, by the end of the year – he’ll still be around, but he no longer has the time needed for the website.

If you’re interested, please contact Russ Sipe (Russell@Sipe.com) or Barbara Toy (btoy@cox.net) to apply. For details on what’s involved in this position, please contact Russ Sipe, or our previous Webmaster, Liam Kennedy.

Instant AstroSpace Updates:

British astronomers have begun a project to link a global **network of telescopes** that will operate remotely for immediate follow-up to new discoveries (such as gamma-ray bursts), or for round-the-clock monitoring of astronomical objects (such as monitoring for gravitational lensing events). 3 telescopes are now linked, and more will be added.

The Byrd radiotelescope at Green Bank has detected simple **sugar** molecules in a cloud of dust and gas about 26,000 light-years away near the center of the Milky Way galaxy. This shows that certain organic molecules can form in space even before planets form out of those clouds.

The **Swift** spacecraft was scheduled for launch by its Delta rocket in October (twice), but due to hurricanes in Florida, launch has now been set for November 8. After 4 months of checkout, Swift will begin detecting gamma-ray bursts and pinpointing their locations within a matter of seconds, relaying this information to Earth for immediate follow up by other types of telescopes.

Radiotelescopes have been combined using **interferometry** for the first time in real-time. Instead of recording the signals and combining them later in a computer, this time 9,000 gigabytes of radio signals were sent live over the Internet to the combining computer, resulting in an image with 5 times the resolution of the Hubble Space Telescope.

NASA has approved for design the Wide-field Infrared Survey Explorer (**WISE**), to launch in 2008, and survey the entire sky with detectors up to 500,000 times more sensitive than previous all-sky survey infrared telescopes. It is expected to find large numbers of brown dwarfs, dusty planet-forming disks around stars, colliding galaxies, and more, producing a catalog of hundreds of millions of objects.

Three hurricanes hitting Kennedy Space Center, and another hitting 3 other NASA facilities, have delayed the planned return to flight of the **Space Shuttles** to at least next May 14.

L. Gordon Cooper, Jr., the youngest of the 7 original astronauts, died at age 77. He made a Mercury flight in 1963 and an 8-day Gemini flight in 1965. Only 3 of the 7 remain.

NASA has selected for further study a proposal to build what is essentially a pinhole camera in space, thousands of miles long, called the **New World Imager**. It should be able to see and take spectra of planets orbiting other stars.

NASA has selected for design a proposal to build an interferometer in space, called **SPIRIT**, composed of 2 large far-infrared telescopes spaced 120 feet apart. When launched in 2014, it will study planet, star and galaxy formation and exoplanets’ atmospheres, with 100 times the resolution of existing infrared telescopes.

A new study found that the human body’s **ability to fight off disease** appears to decrease with longer flights in space, and may continue for some time after returning to Earth. Changes in white blood cells were measured in the study.

Toutatis, an asteroid about 3 miles long, passed the Earth in late September at about 4 times the Moon’s distance, its closest approach since 1353. Discovered in 1989, it was found to have an orbit that brings it fairly close to Earth every 4 years.

The European spacecraft **Venus Express** completed assembly and is on schedule to launch next October. It will analyze Venus’ atmosphere and magnetic field in more detail than ever before.

The **Canada-France-Hawaii Telescope** in (where else) Hawaii has used its record 340 megapixel CCD camera to shoot 1 square degree of sky for 10 hours, and the resulting image showed a record half million galaxies. ■

(continued from page 3)

Please don't let shyness, diffidence or indifference get in the way of what could be one of the greatest experiences you've had in the club. You can become a candidate by notifying me that you want to run, preferably by email so I can be sure to get the name right (btoy@cox.net), or by having someone nominate you at the general meeting in November or December (and, if you don't have a nominator, we'll be happy to find you one, or to waive any need for one). If you nominate someone else, please be sure you check with him or her first – we've had some candidates who were quite surprised to find themselves on the ballot, and were not at all pleased about it.

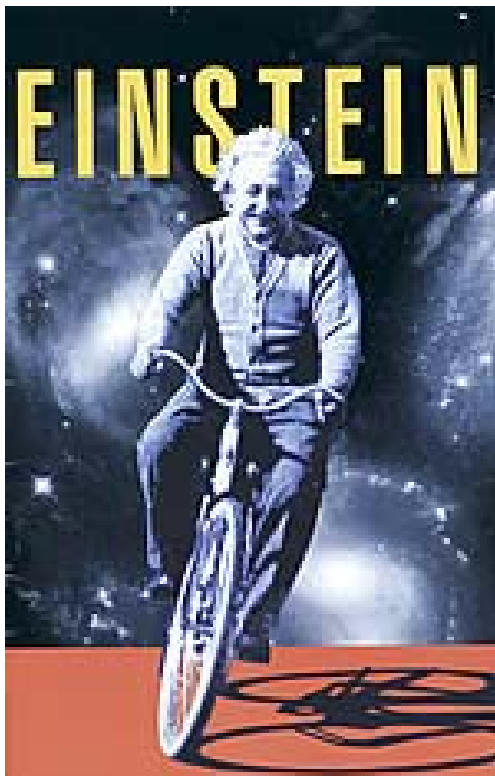
So – I'm looking forward to hearing from you all, and to having a *really* full ballot this year!

In Closing...

The fact that I'm able to write this on my own computer and access all the files I need while doing it I owe to Charlie Oostdyk, who spent an incredible number of hours salvaging it intact from the effects of a very stupid act on my part (Moral: *Always* make sure you have a good and current backup before you install a Microsoft Service Pack, even if it keeps begging you to hit the "install" button...). Very fortunately for me, Charlie regarded it as kind of a game, him against the computer, and he ultimately won. Not only that, but he actually improved its performance, so it's a lot faster than it was before (I'm not sure what the moral to that is).

On behalf of both me and my computer – thanks for all your help, Charlie!

Errata: It's been pointed out to me that I somehow re-christened Mr. Ishikawa in the October President's Message, when I was talking about the sponsors of AstroImage 2004. I'm really sorry about that, Ted! On the bright side, this does give me the chance to thank Ted and Mia Ishikawa and Hutech again for all of their support for OCA's activities over the years – Thanks, Ted and Mia! We really appreciate it!



Want to See the Einstein Exhibit with an OCA Group?

We're putting together an OCA group to see the Einstein exhibit at the Skirball Cultural Center in LA. We need at least 10 people for the group (maximum is 50), and can get a discount as well as a specific time to enter, so we don't have to wait in line. The sooner we get our group together and get our reservations in, the more options we'll have for when we can go. As an added bonus, we should be able to carpool, which will be more fun and less expensive for all concerned.

For more information on the exhibit, see <http://www.skirball.org>.

If you're interested in being part of an OCA group to see this unique exhibit, please contact Barbara Toy at btoy@cox.net – the sooner, the better!



We Need a Coordinator For Explore the Stars!

Richard Cranston, who's been the very capable coordinator for Explore the Stars for the last few years, needs to turn those duties over to someone else for next year. Explore the Stars is a joint public outreach program we do with the National Forest Service and other astronomy clubs. It takes place once a month through the summer months at Observatory Campground on Palomar Mountain (people come from all of the campgrounds on the mountain). The programs start with a talk in the campground amphitheater, followed by public viewing through telescopes and other equipment brought by volunteers. It's a great educational program that also helps show members of the general public why it's so important to preserve the night sky, and, in particular, the sky around Palomar (our Anza site is in the Palomar Protected Zone, so this helps us, too!).

The coordinator sets up the dates for the program with the Forest Service, arranges for the speakers, and sends out reminders and so on to get the volunteers out for each session. For details, please contact Richard Cranston at rcranston@ix.netcom.com. If you're interested in the position, contact Richard or Barbara Toy at bttoy@cox.net.

For Sale: Canon EOS Rebel G, Excellent condition only a few years old. Camera body only. - \$100 o.b.o., Please call Bill Johnson at 714-553-5793 or e-mail at home@byjohnson.com

For Sale: 2 Discovery mirrors, 6" F/5 (new coating) and 6" F/8 (coated last year). Unblemished, in excellent condition, aluminized and quartz overcoated. \$40 each. Contact Bill Hepner at 714-447-8566 or billhepner@yahoo.com

For Sale: Meade 8" SCT; includes GPS and \$1000 in extras. Make a reasonable offer. Gerald Strong 714-538-2517

For Sale (all in like new condition)

Meade LX 200 8" SC Telescope with Telrad and spotter scope.
Televue 16mm Nagler type II eyepiece
Televue 22mm Panoptic eyepiece
Meade Series 4000 26mm eyepiece
Meade Series 4000 9mm Illuminated Reticle eyepiece
Parks GS-5 15mm eyepiece
Meade 4000 #140 Achromatic Barlow 1.25"
Meade Off axis guider
Meade 4000 f 6.3 Focal Reducer / Flatteners
Meade Variable Proj. Tele-Extender
Parks ALP SC rear cell Broadband filter
Lumicon UHC 1.25" filter
Lumicon Oxigen III 1.25" filter
All for \$3000.00, Please serious inquiries only. (909) 924-6652

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	David Radosevich	Dave.Radosevich@ngc.com	310-813-9021
Treasurer	Charlie Oostdyk	charlie@ccd.edu	714-751-5381
Secretary	Bruce Crowe	bcrowe12@pacbell.net	714-971-8427
Trustee	Bob Buchheim	rbuchheim@compuserve.com	949-459-7622
Trustee	Craig Bobchin	ETX_Astro_Boy@sbcglobal.net	714-374-7054
Trustee	Stephen Eubanks	SSEubanks@earthlink.net	714-776-6361
Trustee	Joel Harris	eclipse125@earthlink.net	818-575-9580
Trustee	Tom Kucharski	TomRigel@aol.com	949-348-0230
Trustee	Tony Obra	tonykathydieseldr@comcast.net	714-952-8779
Trustee	Gary Schones	gary378@pacbell.net	714-556-8729

COMMITTEES, SUBGROUPS, AND OTHER CLUB VOLUNTEERS

Webmaster/Press Contact	Russell Sipe	russell@sipe.com	714-281-0651
Sirius Astronomer Editor	Steve Condrey	SiriusAstronomer@OCAstronomers.org	562-983-8894
Observatory Custodian	John Hoot	jhoot@ssccorp.com	949-498-5784
Anza Site Maintenance	Don Lynn	donald.lynn@office.xerox.com	714-775-7238
Astrophysics SIG	Chris Buchen	buchen@cox.net	949-854-3089
Librarian	Karen Schnabel	karen@schnabel.net	949-887-9517
Membership, Pad Coordinator	Charlie Oostdyk	charlie@ccd.edu	714-751-5381
Beginner's Astronomy Class	Antonio Miro	tycmiro@aol.com	714-898-9677
Astrolmagers SIG (co-chair)	Leon Aslan	laslan@earthlink.net	562-433-2922
	Bill Patterson	bill@laastro.com	714-578-2419
Explore the Stars Coordinator	Richard Cranston	rcransto@ix.netcom.com	714-893-8659
Silverado Star Parties	Bob Buchheim	rbuchheim@compuserve.com	949-459-7622
Star Member Training	Barbara Toy	btoy@cox.net	714-606-1825
OCA Outreach Coordinator	Jim Benet	jimbenet@pacbell.net	714-693-1639
Telescope Loaner Program	Bob Bell	liamcelt@earthlink.net	714-808-9233
EOA Liaison	Del Christiansen	DelmarChris@earthlink.net	714-895-2215
Anza House Coordinator	Larry Carr	LarryCarr@sbcglobal.net	714-306-6584
GoTo SIG (formerly ETX SIG)	Mike Bertin	MCB1@aol.com	949-786-9450