SIRIUS ASTRONOMER

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Stephen Hawking, renowned astrophysicist and author of *A Brief History of Time*, leaves his wheelchair for a weightless excursion aboard a jet operated by Zero Gravity Corporation. Hawking has also expressed an interest in a private suborbital flight in the near future (photo credit: AP/ Zero Gravity Corp.)

OCA CLUB MEETING

The free and open club meeting will be held Friday, May 11th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. The scheduled speaker is yet to be announced as of press time.

Next General Meeting: June 8th

STAR PARTIES

The Anza site will be open this month on May 19th. The Black Star Canyon site will be open this month on May 12th. 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, May 4th (and next month on June 1st) at the Centennial Heritage Museum at 3101 West Harvard Street in Santa Ana.
GOTO SIG: TBA (contact coordinator for details)
Astrophysics SIG: May 18th, June 15th
Astro-Imagers SIG: May 15th, June 19th
EOA SIG: May 23rd, June 27th
Dark Sky SIG: TBA (contact coordinator for details)

President's Message

By Barbara Toy

There was a lot going on in April – the banquet, the drawing of the winning ticket in the telescope raffle, Astronomy Day – as I write this, none of these have actually happened yet. However, we did just have a fantastic presentation from Chris Butler at the April general meeting, featuring views from three star systems in our galactic neighborhood that we are very unlikely to have in person in our lifetimes – but now we really *have* seen these places and what they signify in the broader perspective of the births and deaths of stars and planets, thanks to Chris's knowledge and imagination, and to his artistic skills that allowed him to make it all real for us. He got a well-deserved standing ovation, a rare event at our meetings, but a fitting tribute to one of the best presentations we've had in the years that I've been a member of the club. My condolences to those of you who missed it – you missed a really great evening!

RTMC

The highlight of May for most of us is Memorial Day weekend. The highlight of that weekend for the local astronomical community is the RTMC Astronomy Expo (formerly the Riverside Telescope Makers' Conference). For official information about the event, including such things as directions for getting there (it's held at Camp Oaks, near Big Bear City), prices, schedules, speakers, etc., please see the RTMC website: http://www.rtmcastronomyexpo.org/. One item of particular interest this year, at least to those of us in the Astrophysics SIG – the keynote speaker is Dr. Alex Filippenko of UC Berkeley, whose astronomy lectures are a regular feature of our Astrophysics meetings.

To avoid any potential confusion, my take on RTMC is entirely unofficial, and only based on going a few years (some people have been going for decades). RTMC is the largest regular gathering of people with an interest in astronomy in our area. It's fun, informative, and draws folks from all over Southern California and beyond. One major reason to spend the weekend up there at Camp Oaks is the chance it gives to catch up with friends and other people in the hobby, meet new people, and see people in person you may know only by email or reputation. There's a lot going on all weekend, including talks on all kinds of astronomical subjects all day Saturday and Sunday, the swapmeet where attendees sell off unwanted gear (and which is reputedly hottest Friday afternoon and early Saturday morning), vendor booths where great deals can often be found, the famous RTMC raffles on Saturday and Sunday evenings, the Keynote Talk Saturday evening, star parties Friday, Saturday and Sunday nights, a contest for those who made their own telescopes (telescope making is still important to the conference), beginners' activities, and so on – an incredible wealth of things to do.

Though I enjoy the various planned aspects of the weekend and learn a lot from them, what I enjoy most are the informal encounters I've had with so many interesting people in all of the years I've gone to RTMC. These can happen anywhere – in the meeting hall, out on the Telescope Field while cruising the vendor booths during the day or the various telescopes and displays during the star parties, at meals, while covering our booth – there are so many interesting people around that if you make an effort to chat with the people around you wherever you are, it's hard not to get involved in memorable conversations. By the time I leave each year, I've got a lot of good memories and a lot of new information to mull over, so the pleasures and benefits of RTMC live on long after it's over. As you might guess, I highly recommend going for at least a day if you can't go for the full event (and, if you go for just a day, the day with the most going on is Saturday).

Some points to remember if you come to RTMC – Camp Oaks is at 7250 feet, so sunburn can be a problem during the day and cold a problem at night. Sunscreen, a wide-brimmed hat and warm layers of clothing you can add as the temperature drops will help you enjoy your time there fully. A folding chair is also useful, especially if you join the folks outside the meeting hall during the raffles Saturday and Sunday nights (it can be hard to get a seat inside. And the location preferred by most OCA-ers is in *front* of the meeting hall – but well-wrapped up, as it can get quite cold by the end of the raffle and related events). There isn't any power available for telescopes or related equipment, so if you bring your own equipment and need power to run it, be sure to bring enough battery power – or you can plan on doing your viewing the old fashioned way, adjusting your scope manually and finding things by star-hopping.

If you come – and I really hope you do – we take the traditional "OCA at RTMC" picture as soon after 1:00 on Saturday as we can. It'll be taken in front of the OCA booth, so please remember to stop by there at 1:00 and to bring any other club members you happen to run across with you!

Telescope Loaner Program

With summer coming up fast, you may be thinking of getting out and doing some observing – but maybe you don't have a telescope, or would like to try a different kind of telescope than what you currently have available. OCA's Telescope Loaner Program may be the answer you're looking for. Telescopes in the program are loaned to members in good standing free of charge, generally for 30 days at a time (which can be extended if there's no other request for that particular telescope or if the star party weekends were clouded out). Most of the telescopes in the program are Dobsonians, which have been the hardiest of the telescopes donated to the program over the years so they survive longest. There are a number of other types as well – to find out exactly what's available, please contact our Loaner Program Coodinator, Mike Myers, at loanerscopes@twow.com or 714-240-8458.

For those of you who might have some telescope-related equipment you no longer use, especially eyepieces, diagonals, Barlows, Telrads and other finders, and laser collimators or other tools to help with collimation, Mike could really use them to help make the telescopes in the program more functional. If you have a mount you'd like to get rid of, a heavy-duty tripod, or binoculars, please check with Mike before you dispose of them, as he might be able to use them in the Loaner Program. And, of course, if you have a telescope you'd like to donate, Mike would be very interested in hearing from you!

Explore the Stars

The schedule for the Explore the Stars program at Palomar Mountain has been finalized, and the first session will be on May 19, 2007. This program is held at Observatory Campground, and is a really great combination of outreach and informal star party under the same sky conditions that caused the 200-inch telescope to be built at Palomar. The program usually starts with a potluck for the volunteers, then there's a talk by an outside speaker or one of the volunteers in the amphitheater on some astronomical topic likely to be of general interest, followed by a viewing session back in the area where the volunteers set up camp. One particularly nice aspect of Observatory Campground is that it has a large open area suitable for viewing, and even has some concrete pads (though not enough for all of the volunteers, and without power). They also cut the lights on ETS nights, so the campground is nice and dark – great for showing people some of the lovely fuzzies that we astronomers find so exciting!

People are invited to attend from all of the campgrounds on the mountain, and often there are scout groups or other groups among the viewers. I've also talked to people who come up the mountain specifically to attend the ETS session, because they've enjoyed past sessions so much, and who then drive back home after they finish viewing instead of camping there all night. It's a great family event, and often the volunteers bring their children to enjoy a night of camping along with the viewing.

Generally, the public viewing part of the event is over by around 10:00, and then the volunteers settle down for some serious viewing in their own informal star party. As with any star party, that part of the proceedings is ended either by exhaustion or sunrise. It's all a lot of fun, and you should give it a try – go early, and see the observatory, as well!

For more information and to volunteer, please contact the current coordinator of the ETS program, Bob Nanz, at bobnanz@direcway.com or 760-751-3992, or contact our local contact for the program, Richard Cranston, at rcransto@ix.netcom.com or 714-893-8659.

Sidewalk Astronomy Night:

Just a reminder – I wrote about the Sidewalk Astronomy Night program last month. That is still scheduled to take place on May 19th, as well. For more information about doing sidewalk astronomy in general and about this event, please check their website, www.sidewalkastronomers.us. If you do participate, please let me know and I'll send that information on to the coordinator, Donna Smith, to help in their count of participating telescopes. They hope to have a turnout of 1000 telescopes doing sidewalk astronomy that day, in honor of John Dobson.

OCA's booth at the Sally Ride Festival

The Sally Ride Festival

For the third year in a row, OCA participated as an exhibitor at the Sally Ride Festival at UC Irvine, which was held on February 4 – it was an incredible event, and I'm sorry I didn't have room to talk about it in the past two President's Messages. Better late than never – and I'm hoping that we will continue to be a regular exhibitor at future festivals, in which case you might want to consider coming as a volunteer yourself. It's well worth it!

These were started by Sally Ride and are now held at a lot of different universities and colleges around the country each year. Their primary goal is to keep girls interested in science and math at an age when they historically have dropped out of those areas in large numbers. The target group is 5th grade girls, but there are a lot of people in older and

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AstroSpace Update

May 2007
Gathered by Don Lynn from NASA and other sources

Binary-star planets – It has long been known that planets can form around binary stars that are quite distant from each other (say over 1000 times the Earth's distance from our Sun [1000 AU]), since such stars orbit far beyond where the planets do. In fact, about 1/4 of the more than 200 known exoplanets orbit widely separated binary stars. But it has long been believed that closer binary stars would disrupt the planet forming process. The belief had not been tested because standard planet-finding techniques do not work well on closer binary stars (gravitational interactions of the stars mask smaller effects from planets). A new study by the Spitzer infrared space telescope of 69 binary star systems closer than 500 AU apart showed the belief to be false. Planets are too small to see with present technology, but the dusty disks that accompany them can easily be seen by Spitzer. About 40% of the systems studied have dust disks of the type that accompany planetary systems. This is more frequent than single stars. Very close binaries (less than 3 AU apart) had a 60% rate of planetary dust disks. So the sunset of 2 closely spaced stars portrayed on the fictional planet Tatooine in Star Wars is a scientific likelihood. There was some truth to the old belief that planets were unlikely with double stars, in that the Spitzer study showed there is an intermediate range of star separation, from 3 to 50 AU, which showed a lower percentage of planetary dust disks than normal.

Binary asteroid – Data collected on a variety of telescopes, ranging from the 10-meter Keck II in Hawaii to a 7-inch amateur telescope, show the asteroid Antiope to consist of 2 slightly egg-shaped rubble piles locked in orbit, like 2 twirling dancers facing each other. They orbit every 16.5 days, are 7% elliptical, and are each 53 miles in diameter and 1.25 times the density of water. The initial discovery that it was binary was made by the Keck II using adaptive optics about 5 years ago. Further study with adaptive optics on the Keck II and the 8-meter VLT in Chile measured their orbit. From this it was predicted that a period during 2005 was approaching when the 2 would occult, transit or eclipse each other. Observations of these allowed each object's precise size and shape to be measured. The masses were calculated from the orbit, and the densities calculated from the sizes and shapes. The densities indicate about 30% is empty space, so both are rubble piles that accumulated after a collision broke them up. It was calculated that the collision must have occurred about 2.5 million years ago. The shapes matched the theoretical ones that loose rubble piles assume when in tight orbit. Observations will continue on this and other binary asteroids, using both professionals and amateurs.

Asteroid eaten – For the last 2 years astronomers have suspected that the dust found around a white dwarf star known as GD 362 was caused by an asteroid shredded by tidal forces near the star. Heavier elements, such as are found in dust, were found in the surface of the star. New infrared spectroscopic observations by Spitzer have analyzed the dust and determined that it is indeed the type that comes from asteroids. This rules out explanations for the dust that involved interstellar dust clouds colliding with the star, as such dust has a different makeup. Dust on the star would sink into the white dwarf, and dust around the star would have been destroyed by its previous phase as a red giant. So the dust observed has to have come from a recent (astronomically) breakup of an asteroid. The Spitzer observations also showed the dust was confined to an area relatively near the star, another piece of evidence supporting its origin from a shredded asteroid.

Cassini (Saturn mission) has imaged an odd hexagonal feature about 15,000 miles across, enclosing the entire north polar region of Saturn. The Voyager spacecraft had imaged it in less detail 2 decades ago, but it was not known the feature would have persisted so long. It had not been seen before by Cassini because the north pole is having winter and is in darkness for about 15 Earth years. So Cassini imaged it in infrared, which works fine in nighttime darkness. Some wavelengths of infrared penetrate miles of clouds and showed the hexagon penetrates at least 60 miles down into the clouds. No other planet has such a feature. The other pole of Saturn has a hurricane-shaped feature, not hexagonal. The hexagon appears to rotate at the speed of the planet, though some clouds within it rotate faster.

Cassini continues to find **lakes** of liquid methane and ethane in the north polar areas of Saturn's moon Titan. The latest includes one larger than any of the Earth's Great Lakes, and it is truly the size of small seas on our planet. The new lakes (or seas) were seen in both radar and infrared. Although liquidity cannot be directly measured, these and previous lakes have the shoreline shape, dark appearance in radar, and exceptional smoothness characteristic of liquid.

This column reported last June that Cassini measured the **rotation period** (day) of Saturn to be 6 minutes longer than the Voyager spacecraft measured it. The technique of measuring, used on all gas giant planets, is to time the rotation of the radio-emitting features in the magnetic field of the planet. The magnetic field appears to be anchored deep within the gas giant planets, and so is unaffected by the surface winds that cause cloud features to rotate at various speeds. Further Cassini observations have now shown that the moon Enceladus is throwing so much geyser material into the E-ring, which eventually becomes ionized and then is dragged along by the magnetic field, that the radio-emitting plasma in the field gets slowed down in its rotation. The question to be answered now is whether the slowing since Voyager is a result of seasonal effects or of a change in the amount of material thrown off by Enceladus.

A new computer simulation of **Enceladus** appears to explain how the moon is hot enough to have geysers spewing water vapor and other materials. In the simulation the moon got quite hot soon after its formation due to decay of short-lived radioactive aluminum and iron. Since that time further decay of other radioactive materials combined with tidal heating would be just enough to remain hot enough internally today for geysers. The simulation also explains the traces of material thrown by the geysers that

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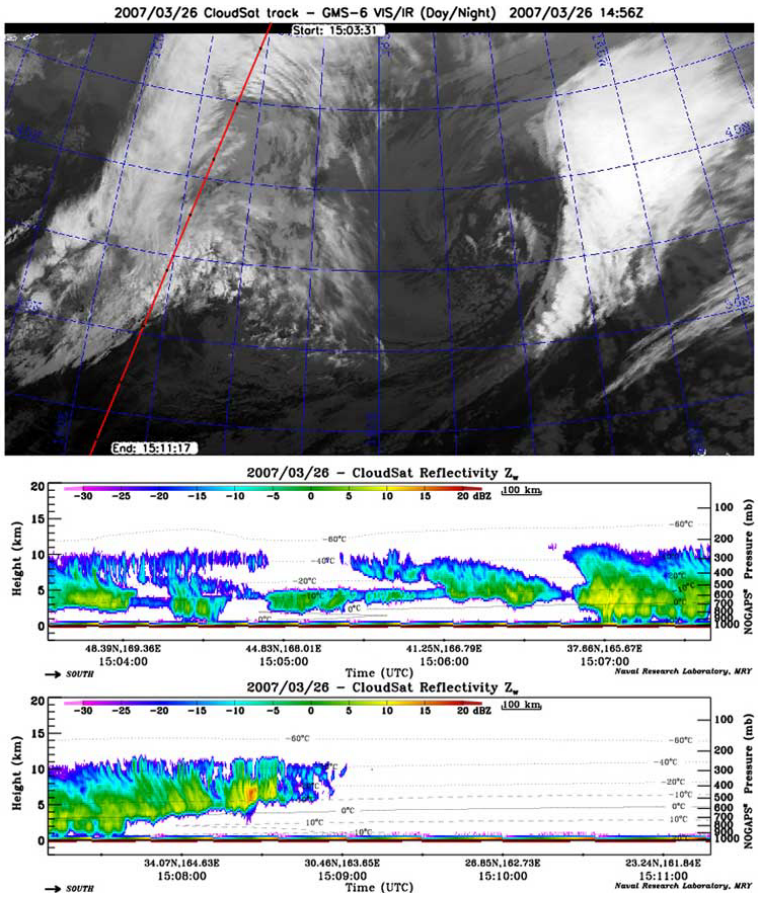
Clouds from Top to Bottom

By Patrick L. Barry

During the summer and fall of 2006, U.S. Coast Guard planes flew over the North Pacific in search of illegal, unlicensed, and unregulated fishing boats. It was a tricky operation—in part because low clouds often block the pilots' view of anything floating on the ocean surface below. To assist in these efforts, they got a little help from the stars.

Actually, it was a satellite—CloudSat, an experimental NASA mission to study Earth's clouds in an entirely new way. While ordinary weather satellites see only the tops of clouds, CloudSat's radar penetrates clouds from top to bottom, measuring their vertical structure and extent. By tapping into CloudSat data processed at the Naval Research Laboratory (NRL) in Monterey, CA, Coast Guard pilots were better able to contend with low-lying clouds that might have otherwise hindered their search for illegal fishing activity.

In the past, Coast Guard pilots would fly out over the ocean not knowing what visibility to expect. Now they can find out quickly. Data from research satellites usually takes days to weeks to process into a usable form, but NASA makes CloudSat's data publicly available on its QuickLook website and to users such as NRL in only a matter of hours—making the data useful for practical applications. "Before CloudSat, there was no way to measure cloud base from space worldwide," says Deborah Vane, project manager for CloudSat at NASA's Jet Propulsion Laboratory.



A CloudSat ground track appears as a diagonal line overlaid upon a GMS-6 (a Japanese weather satellite) infrared image. CloudSat is crossing the north-central Pacific Ocean on a descending orbit (from upper-right to lower-left) near a storm front. The radar data corresponding to this ground track (beginning in the center panel and continuing into the lower panel) is output in color and shows a vertical cloud profile far more complex than the two-dimensional GMS-6 imagery would suggest.

CloudSat's primary purpose is to better understand the critical role that clouds play in Earth's climate. But knowledge about the structure of clouds is useful not only for scientific research, but also to operational users such as Coast Guard patrol aircraft and Navy and commercial ships at sea.

"Especially when it's dark, there's limited information about storms at sea," says Vane. "With CloudSat, we can sort out towering thunderclouds from blankets of calmer clouds. And we have the ability to distinguish between light rain and rain that is falling from severe storms." CloudSat's radar is much more sensitive to cloud structure than are radar systems operating at airports, and from its vantage point in space, Cloudsat builds up a view of almost the entire planet, not just one local area. "That gives you weather information that you don't have in any other way."

There is an archive of all data collected since the start of the mission in May 2006 on the CloudSat QuickLook website at cloudsat.atmos.colostate.edu. And to introduce kids to the fun of observing the clouds, go to spaceplace.nasa.gov/en/kids/cloudsat_puz.shtml.

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

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can only form at high temperatures (which were reached in the initial radioactive decay), and the nitrogen in the geysers, which formed from decomposition of ammonia in the simulation.

Mars Express has probed the south polar cap of Mars by radar and found that a huge quantity of water ice extends far below (up to 2.3 miles) and beyond the visible cap. The region contains enough frozen water to cover the entire planet 36 feet deep if it were to melt (but such an ocean would not last at the current temperature and pressure). The water ice is mixed with thin layers of dust, but appears from the radar data to be about 90% ice, and is covered in some areas by dry ice (frozen carbon dioxide). An area with an especially bright radar reflection at the base of the ice puzzles researchers. It resembles what a thin layer of liquid water looks like in radar, but the conditions there should be too cold for liquid water. The crust has not been measurably depressed by the weight of the ice, which indicates the crust and upper mantle of Mars are stiffer than the Earth's, probably because the interior of Mars is so much colder. Measurements are now being made of the north polar region.

Spirit (Mars rover) churned up some bright Martian soil containing lots of sulfur, iron, possibly calcium and a trace of water just before it parked on a sunny slope for the Martian winter. The bright white and yellow material was hidden under a layer of normal red-brown soil until the rover's wheels disturbed that layer. Infrared observations from a distance continued during the parked period, determining the composition. Even though the rover is roving again, now that Martian winter is over, Spirit will not be commanded back to the area for further observations because it almost got stuck in the very soft soil when it drove through the first time. Besides a good deal of the soil stuck to the broken front wheel, and measurements were made of it on the wheel. But scientists will watch for more patches of similar soil on future drives. The 2 best theories of the bright soil's origin are that water with dissolved minerals was emitted from underground or mineral-rich steam from a volcanic vent left the material. Spirit continues to explore around Home Plate, a plateau.

Opportunity (the other Mars rover) continues to explore around Victoria Crater, making observations of the exposed geological layers on the sides of the crater. It found a rock that controllers named Santa Catarina, which is suspected to be a meteorite. It would be the fifth one found by the rovers.

New Technology Telescope in Chile has conducted a search in infrared for globular clusters hidden in visible light by the dust in our Milky Way galaxy. Candidates were chosen from the 2MASS infrared survey. So far one probable new globular has been found. It is 30,000 light-years from us and 10,000 from the center of the Milky Way. It contains about 100,000 stars, is 7 light-years across and its mass is 65,000 times that of the Sun. Spectroscopic measurements will be taken to determine the age of its stars to confirm it is a globular. About 150 globular clusters are known to orbit the Milky Way, and estimates are that about 10 should remain undiscovered due to dust.

Chandra (X-ray orbiting telescope) has produced a mosaic image covering over 9 square degrees of sky that shows well over 1000 black holes at the centers of distant galaxies. Images of the same area were made with the Spitzer infrared telescope beforehand to find candidates for black holes, and various ground-based visible-light telescopes imaged the area afterward for verification. Theory says that such black holes should be surrounded by donuts of gas, obscuring some of them in varying degrees, depending on viewing angles. But observing in X-rays allows even the most obscured black holes to be seen. The surprising result of this study is that about 600 black holes are heavily obscured, 700 not obscured at all, and very few obscured partially. This will require rethinking of the theory. Most of the black holes lie at such great distances that their X-ray light took between 6 and 11 billion years to reach us. Most have the mass equivalent of hundreds of millions to billions of times the Sun's. The Chandra mosaic was made from 126 images of 5000 seconds exposure each. It has 80 times the area of sky as the famous Chandra deep field image, but not as long exposure.

Chandra also observed a cloud of material eclipse the disk about the **black hole** in the center of galaxy NGC 1365. Analysis of the observation allowed scientists to measure the location of the cloud (1/100 light-year from the black hole) and the size of the disk (7 AU). The disk is about 10 times larger than the size of the black hole's event horizon, the location where objects disappear forever when they enter the black hole. This confirms for the first time theoretical predictions of the size of such a disk. Matter in the disk will likely be pulled into the black hole within about a hundred years. However, the cloud of material was much closer to the black hole than predictions.

Swift (gamma-ray burst [GRB] satellite) has discovered some GRBs that don't fit the usual mold. Normally the X-ray telescope (XRT) on Swift can see the afterglow from a burst for a week or 2 until it fades to near invisibility. But the afterglow from a GRB last July remained visible to XRT for more than 125 days. This visibility requires continuous energy from some source for long after the GRB, and requires a total energy more than current explanations. The burst's afterglow also did not vary as much as it should, which implies that its jet was much wider than theory predicts. Again, that requires more energy than GRB theory can provide. One possibility is that the GRB was produced by the supernova of a magnetar, and the powerful magnetic field and fast rotation of the magnetar is supplying the extra energy. Another burst that didn't fit the mold occurred in January, which maintained peak afterglow brightness for 5 hours instead of fading rapidly. This also looks like a magnetar could explain it.

Strange supernova – In October 2004, a star was observed in a galaxy in Lynx, 77 million light-years away, letting loose an outburst so bright that it was at first mistaken for a supernova. But the star survived without exploding for about 2 more years, and then finally blew up as supernova 2006jc. A stellar outburst followed by a supernova has never been seen before. The supernova was a peculiar variant of type Ib. The blast wave from the supernova was observed a few weeks later colliding with the material thrown off by the previous outburst. From the measurement of X-rays emitted by the collision, the amount of material thrown off

previously was calculated to be 1% of the Sun's mass. The X-rays continued to brighten for 100 days after the supernova, something never seen before; supernovas usually dim quite quickly in X-rays. A new analysis proposes that the star was a Luminous Blue Variable (LBV), a class of star that is prone to outbursts so extreme that they have been mistaken for supernovas. The supernova, however, was judged to be of a Wolf-Rayet star, a class of hot, highly evolved stars that have shed their outer envelopes. Supposedly the star transitioned from LBV to Wolf-Rayet in the intervening 2 years. Theorists are still not sure how this could all happen.

AIM is scheduled for launch by the time you read this, and will study noctilucent clouds, which form in the mesosphere, about 50 miles up, just above the stratosphere. They are generally seen only in the polar regions during summer nights, lit by the Sun shining at their height while the Earth below is dark. There are no reports of them being seen before the later 1800s. AIM will study how and why noctilucent clouds form. Instruments onboard are the Solar Occultation for Ice Experiment, the Cloud Imaging and Particle Size Experiment, and the Cosmic Dust Experiment. They apparently are affected by temperature, water vapor, solar activity, atmospheric chemistry and presence of small particles. Theory has it that the clouds condense on small particles, but it is not known whether those particles are meteor dust or dust of Earthly origin. These clouds have grown brighter and more prevalent in recent years, and this may or may not be a result of climate change.

International Space Station (ISS) – A Russian Soyuz rocket launched April 7 carrying American space tourist Charles Simonyi and 2 cosmonauts (Yurchikhin and Kotov) to the ISS. Forbes magazine says that Simonyi is a billionaire, barely, so can afford the $20+ million price tag for space tourism. After 13 days in space, Simonyi is scheduled to return to Earth with the Mike Lopez-Alegria and Mikhail Tyurin, who have completed 6 months aboard ISS. Astronaut Suni Williams, who arrived in December, will remain on the ISS until shuttle Endeavour visits this summer.

Planet finding – Researchers have successfully demonstrated in the laboratory optical technology to suppress diffraction and scattered light sufficiently to see an Earth-like planet orbiting another star. A pair of masks blocks the star and its diffraction rings or spikes, and a deformable mirror under computer control eliminates scattered light due to imperfections in the primary mirror. The result is the ability to see a planet 10 billion times dimmer than its star, at least 1000 times better than anything demonstrated previously. The technology is expected to be used in the Terrestrial Planet Finder and other similar future missions.

OSIRIS mission has won NASA competition to proceed designing the spacecraft to visit near-Earth asteroid 101955 (unnamed as yet) in 2013 and return a 5-ounce sample to Earth 4 years later. The asteroid is believed to be covered with carbon compounds. It is classified as potentially hazardous, though it currently gets no closer than the Moon to Earth. It is about 1900 feet across. OSIRIS will also study the Yarkovsky effect, which pushes asteroids about (very slightly, very slowly) because of emitting absorbed heat from sunlight. A decision on whether to proceed with spacecraft construction is scheduled for late this year.

Instant AstroSpace Updates

As reported here last month, a sudden explosive thunderstorm battered the **space shuttle** Atlantis with golf-ball-sized hail, causing extensive damage to the insulation on the external tank. Repairs to the 2600 dents are taking longer than expected, and launch has been further postponed until June 8.

Analysis of glacial sedimentary rocks in Oman showed that the Cryogenian period, roughly 850 to 544 million years ago, consisted of both cold and warm periods, contrary to the **Snowball Earth** theory that claims all the Earth's oceans froze for this time period.

The VLT 2 telescope in Chile set a new record by beginning a digital spectrogram of the afterglow of a **gamma-ray burst** within 7.5 minutes of its discovery. This was accomplished by an automatic system driven by the electronic message from the Swift gamma-ray satellite.

A spectrum taken by VLT 2 of another **gamma-ray burst** showed that the afterglow consisted of a gas cloud that had been ionized (stripped of electrons) out to a distance of 5500 light-years from the point of the burst, much farther than expected.

An analysis of the **solar flare** last December 6 showed that it produced about 10 times the radio noise of any previous one, interfered with many GPS receivers and other radio communication, and peaked at 20,000 times the radio noise of the entire rest of the Sun.

Two scientists believe that images from Mars Odyssey show the openings to 7 **caves** near the Martian volcano Arsia Mons. Further observations will be required to verify this.

A hub that will connect new units to the ISS has been named **Harmony**, the winning name in a contest for the nation's schoolchildren. It is scheduled to launch on the shuttle Atlantis later this year.

Astronaut **Suni Williams** qualified for the Boston Marathon, but found herself in space the day of the race. She received permission from marathon officials to run the 26.2 miles on the space station treadmill.

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younger categories who also come, and we also saw a number of boys, a lot of parents, and a lot of teachers, some escorting groups of students.

The festival starts off with the street fair, where all of the exhibitors have their booths and displays, then there is a keynote address by either Dr. Ride or another astronaut, and then smaller sessions on various topics. Our "booth" is part of the street fair, and we generally have a table with information and whatever display items different volunteers bring, and behind and around the table we have telescopes set up for solar viewing through different filters. Don Lynn brings some of the pictures he's downloaded from various NASA and other sites, and other volunteers bring pictures, posters and other things they think might be of interest. This time, Kyle Coker brought some pictures from the AstroImagers' image gallery, featuring a lot of beautiful prints that were donated to the club through AstroImage 2006, and those attracted a lot of attention as well as the telescopes.

We had a lot of people come through our area, asking questions about the pictures, about what they could see in the telescopes, and general questions about astronomy, as well. One of the most interesting groups I talked to was a group of deaf students – it was a bit unnerving to have my explanations of the pictures they were looking at signed to them by someone standing next to me (so she could see what I was pointing to and so the girls could see both her and me without constantly turning from one to the other), but it seemed to work and we were able to discuss the Andromeda Galaxy and the Orion Nebula, which were the pictures in the display that had caught their attention.

For some reason, we did not get news of the festival as far in advance as usual this time, and so we didn't have much time to prepare for it. In spite of that, thanks to a very helpful group of volunteers, we were able to get enough telescopes to handle the crowds and we were able to present a lot of different information that appealed to a wide range of interests. The festival sold out, and we understand that there were over 2000 people in attendance, so we were all kept quite busy during the two hours that the street fair was running. My thanks to the volunteers who came to help out on such short notice: Don Lynn, Val Akins, Dan and Irene Iler, Kyle Coker, and Rick Rios and his wife and daughter.

The festival has been such a success at UCI that they expect to do it again next year – I'll try to get the word out about it earlier, so maybe more of you will be able to participate and help make our display area even more interesting to the girls and other people attending. All of the festivals have been a lot of fun for the volunteers – as I said before, it's well worth it to come! ■

OCA member Don Lynn gives guests a view of the Sun at the Sally Ride Festival

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HOME WITH OBSERVATORY FOR SALE by former OCA member. 2700 square feet, 5 acres fenced for horses or livestock with barn, spa, pool and storage space. For more information, go to http://www.cfsmithrealty.com (reference 'Tule Oak Property') or contact Billie Chandler at 555-539-0900/

FOR SALE: Coulter Odyssey 13.1" f/4.5 Dobsonian w/Telrad. Very good condition. $450. Contact Steve Bird at 562-234-2157

What have you been doing in the Dark?

Have you been doing a project that other OCA members would be interested in learning about? Have you participated in an astronomical activity that would entertain the other OCA'ers? For example, perhaps you have:

- Taken an astronomically-oriented expedition (stargazing at Lake Titicaca?)
- Made a telescope or an optical instrument (a handicap-friendly telescope?)
- Conducted a research project or astronomical investigation (photometry? double-stars? spectroscopy?)
- Exposed the stars at a unique "outreach" venue
- Made an unusual observation (anyone discover a supernova or asteroid?)
- Participated in a special activity by one of our Special Interest Groups (visited a major observatory? Used a remotely-operated telescope?)

If you have, then it's time to start thinking about your presentation for the "Member's Night" December OCA Meeting. Don't keep it to yourself: Inquiring minds will want to know what you've been doing in the dark!

The OCA is filled with inventive people doing new, intriguing, and wonderful things. We'd be delighted if you would present a 10-15 minute description of one of your astronomical activities at the December OCA meeting. To add your name to the presenter's list, please contact Craig Bobchin by e-mail at ETX_Astro_Boy@sbcglobal.net

WAA Board Meeting Notes

by Tim Hogle

The Western Amateur Astronomers (WAA - an umbrella organ-ization of astronomy clubs, of which OCA has been a longstanding member) again held its annual winter Board meeting at John Sanford's Starhome observatory in Springville, CA. John has been a most gracious host for this event for the last several years. The WAA's purpose is to promote communication between astronomy clubs for their mutual benefit, to give awards for recognition of outstanding achievement in the world of amateur astronomy and to promote astronomy in general. Most WAA member clubs are based in the Western US, but membership is open to all interested clubs.

WAA's most well known function is annually awarding the prestigious G. Bruce Blair Medal to an individual who has made truly outstanding contributions to amateur astronomy. This year's recipient is to be Carter Roberts. Carter has been a long time active volunteer in the San Francisco bay area's astronomy community, taking a large role in the design, location and site testing for the new Chabot Space & Science Center and refurbishment of its historical telescopes. He also has been Historian of Chabot for many years, as well as a longstanding president of the Eastbay Astronomical Society.

A full bio on Carter is shown on the WAA web site at http://www.waa.av.org, as is the list of past Blair recipients, going back to 1954. The list includes several OCA members and nominees. The award will be presented to Carter at the Riverside Telescope Makers Conference.

The WAA Board is still looking for ideas to replace our 50-year old logo with a more up-to-date, modern one. I mentioned this in a previous column, and not received any inputs. If you would be interested in creating a logo and have some artistic skills, contact me. My contact info is on the back of the Sirius Astronomer.

WAA will again have an information booth at RTMC this year. Stop by and say hello. For more info about WAA, go to the Web site at http://www.waa.av.org. ■

Marathon 2007: the one that got away

by Bill Warden

After 2 consecutive years of fog and 4 boxes of white on the clear sky clock starting at 4 AM, I was anticipating a good night's sleep this year. Conditions started with scant clouds to the north, very slight haze and a small light pollution dome to the north-northwest. Seeing was fair with Saturn wobbling at 200x in my 8" SCT even at transit. But by midnight the Messier's were blazing away brighter than I've ever seen at Anza. Things got even better for second heat at 4 AM with no trace of fog or haze! If previous fog discouraged you from this year's marathon, you missed a good one. I encourage you to give it a try next year.

M74-the one that got away
(Imaging done 11/06 from Los Alamitos, CA)
http://whwastro.homestead.com/files/m74-800-wide.jpg

After 20 minutes of wiffing on M74, I saw what appeared to be a stellar object with slight nebulosity surrounding it. A few others observed it through my scope as well. I checked it off and moved on, but as the sky darkened and M77 and M110 improved, I was no longer able to see a trace of M74. Alas, as I think I further on this, I wonder if I mistakenly returned to M77, although it's a bit more diffuse than M74. The jury is still out, but I'm afraid this one got away.

Others on the football field also struggled with M74, but with improving conditions, the crowd tore through the rest of the objects with no difficulty (I was using a goto scope). There were many observing high points for me. Early on there was the complete lower ring of the Orion nebula and the chance to share the planetary surprise in M46. The moderate seeing made the open clusters shimmer nicely. Mid marathon highlights included the dust lane in the Sombrero (M104), teasing out detail in the cigar galaxy (M82) at high power, the swirls of the whirlpool (M51) with only slightly averted vision. Detail in the Leo triple's M65 and M66 including the eerie dust lane and nebulosity around 3628 were also nice. Late highlights included dark enough

skies to catch M27 as a football rather than a dumbbell, a sharp ring (M57), a very swan-like M17, detail in the Trifid (M20), and M13 blazing away at zenith. Of course the mark II eyeballs on Orion and the milky way deserve mention.

Low points included M40, whiffing on M57's companion galaxy IC 1296, failure to resolve the pillars in M16 (even the nebulosity was difficult except though a wide view through my finder scope), and failure to catch the wedge in M27 with an Oiii filter. Looks like I'm going to have to come back this summer. Few were silly enough to try for globular cluster M30, which cleared the horizon less than an hour before sunrise. With tears in my eyes (from too much light) I wasn't close to detecting it despite valiant attempts with filters and high power eyepieces to darken the background. (OK, so I missed more than one). The highs and lows were shared by those around me: Luigi struggled with collimation issues while Christa and her husband marveled over views through an eyepiece the size of a can of Guinness. The imager's had their share, struggling over guiding issues or rejoicing at 3 minute unguided 1000 mm. subs.

Non observing highlights for me included remembering two big pillows, bringing almost enough clothing to stay warm, and sunglasses to preserve my night vision when checking out real time field of view star charts with my palm pilot planetarium software from http://www.aho.ch/pilotplanets/ (the older version (2.3.1) runs a bit faster on my palm). Low points included my battery dying at midnight—thank goodness for the outlet at the football field—forgetting to bring the Guinness, and the microwave burrito I had for breakfast.

Overall it was a great experience for this suburban observer/astrophotographer. If nothing else, the marathon as an "event" forces me to commit to going the extra mile—well more like 120 miles—for dark skies.

PS, Don Pensack at Mt. Pinos reported that the entire LA basin, SoCal coastline and all of SoCal north to Pyramid Lake was covered with a dense marine layer of clouds over 5000' thick. Perhaps this improved our viewing. ■

Society for Astronomical Sciences 2007 Symposium on Telescope Science

by Bob Buchheim

Several years ago, I was surprised to learn that amateur astronomers can contribute to astronomical science and collaborate with professional astronomers, using our modest equipment to gather genuinely new scientific knowledge. Amateurs have a long tradition of providing variable-star observations and discovering comets. More recently, aided by CCD imagers, amateurs are conducting detailed characterization of variable stars and asteroids; contributing to the search for extra-solar planets; doing astrometry of binary stars; and discovering previously-unrecognized variable stars.

One of the challenges to getting started in this exciting enterprise is learning about the projects where amateur help is needed, and meeting the people who are doing this work. The annual SAS meeting is the premier forum for collaboration between amateur and professional astronomers. The symposium is held each year during the week before Memorial Day, at Big Bear CA (making a convenient pre-RTMC meeting). This year, a three-day format is scheduled. On Tuesday May 22, there will be Tutorial sessions on photometry and spectroscopy – a great way to learn the basics of these important techniques. The main Symposium presentations of research results (both amateur and professional) will be Wednesday and Thursday, May 23-24. The agenda hasn't been released yet. Typically, the range of topics includes asteroid studies, variable stars, new instruments and techniques, and descriptions of professional projects that are in need of amateur collaboration.

Why might a professional astronomer want to collaborate with amateurs? We have several unique capabilities that the pros don't have:

- easy access to telescope time (we don't have to go through a "scheduling committee");
- the flexibility to engage in long-term monitoring of target objects (dedicating my telescope to a week of nights on a single asteroid is fun for me, but prohibitive for the professional astronomer); and
- portability (we can carry our telescopes to the centerline of an occultation, but the pros are primarily stuck at fixed observatory sites).

Last year's meeting was a joint meeting between SAS and the Center for Backyard Astrophysics, and included quite a few papers describing variable-star studies and (successful) exo-planet searches. OCA'ers who attended in 2006 included Bob Gill (who is on the SAS Program Committee), Larry Owings, Bob Buckner, Wayne Johnson, Sheila Cassidy, and John Hoot (who presented a joint paper with Mark Whorten of NASA, on astrometry of solar-sail satellites). We also had an impressive international participation: amateur astronomers from Canada, New Zealand, South Africa, Belgium, and Uzbekistan attended and presented papers on their research projects.

The SAS Symposium is an educational, entertaining, and motivational opportunity for any amateur astronomer who had a childhood dream of doing "real" astronomy! Registration details can be found at http://www.socastrosci.org. ■

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