SIRIUS ASTRONOMER

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The Newsletter of the Orange County Astronomers

June 2010 *Free to members, subscriptions $12 for 12 issues* **Volume 37, Number 6**

This image of north circumpolar star trails was captured by Larry Adkins on February 4, 2005 from our Anza site using a Canon 300D and a 55-minute exposure.

OCA CLUB MEETING

The free and open club meeting will be held June 11th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. This month, our speaker will be Bahram

STAR PARTIES

The Black Star Canyon site will be open on June 5th. The Anza site will be open on June 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, June 4th at the Centennial Heritage Museum at 3101 West Harvard Street in Santa Ana.
GOTO SIG: TBA
Astro-Imagers SIG: June 15th, July 20th
Remote Telescopes: June 28th, July 26th
Astrophysics SIG: June 18th, July 16th
Dark Sky Group: TBA

June 2010 President's Message

by Craig Bobchin

Welcome to the June 2010 Sirius Astronomer and President's message. I'd like to start off with a brief weather report. In both April and May, we've had some unusually wet weather and are now starting to get into "June Gloom" in the evenings and mornings. This means that we will have abundant flora out at the Anza site later this year and when the heat starts later in the year abundant dead flora. Abundant dead flora means "Fire Hazard". So please create a defensible space around your Pads and observatories by clearing out weeds and flammable trash. The deadline for Pad/Observatory clean up has been extended to June 30th.

Another thing to remember about our dark sky sites is that in addition to Flora there is also fauna. Much of said fauna would not be considered cute and cuddly. Anytime you are at Anza, Black Star Canyon or any other rural or wilderness area. You should keep a wary eye out. A perfect example came up at the May Anza Star Party. Alan Smallbone was working on his warming room and came across a medium sized (about 4 feet long) rattlesnake outside the building. Had he not noticed it and gotten bitten it could have had serious consequences.

The most common poisonous creatures that can bite you at both of our viewing sites are rattlesnakes and black widow spiders. You may also come across scorpions, bees, wasps, and red ants that sting. Those with observatories should be on the look out for Hives/nests of both bees and Wasps. You may also come across rodents such as rats, mice, rabbits, squirrels, deer, coyotes, and bats amongst other wildlife. Just a reminder, don't try to feed them or touch or pet them, no matter how cute and harmless they might appear, since they can still bite, scratch, kick or otherwise harm you, not to mention they can also be carriers of disease such as rabies.

The main method to ensure that you or your loved ones do not get bitten is a simple one. Do not put your hands, feet or other body parts in any holes that you aren't sure are empty. Also stay on the paths and don't wander off into the bushes. Also don't be shy about advertising your presence so local wildlife can get out of your way, check ahead and to the sides of where you're walking for snakes and stay out of striking distance of any you see, and don't leave food around at Anza House or the observatory as that attracts rodents and we'd really prefer to keep them outside of our buildings as much as possible.

Special Interest Groups:

Among the benefits of being a club member besides access to Anza and the great people that you'll meet and become friends with, are our special interest groups (SIGs). We have enough that will appeal to just about anyone. One of best and great for beginning astronomers is the Beginner's class. It is held the 1st Friday of he month at the Heritage Museum of Orange County in Santa Ana. The Beginners Class is an informal introductory astronomy course that is free and open to the public. The course consists of six sessions covering basic astronomical concepts and practical concerns. In addition to the classroom discussions, a telescope is available for "show and tell," weather and sky conditions permitting. The course culminates in a "Learn How to Use Your Telescope" session where people can bring their telescopes and get assistance from club volunteers in setting them up and learning to use them. This is usually held outside but in the event of adverse weather we move this inside.

Another popular group is the Astrophysics SIG where in we meet again at the Heritage Museum. At these meetings we learn about the latest discoveries in the realm of Cosmology and Astrophysics. We do this through both viewing of video lectures and discussion. The Astrophysics SIG meets the third Friday of the month.

The Go-To Group typically meets on the first or second Monday of alternate months. We meet to discuss computerized Go-to telescopes and how to use them, make them work better and discuss what to look at in

(continued on page 10)

April Anza Star Parties

By Barbara Toy

We had two star parties at Anza in April, because the new moon fell on a Wednesday. This gave us two chances to have a good night out there. As I write this on the second of these nights, I have to admit to being one of the people who didn't make to Anza because the weather forecast was too dismal – high, thin clouds over most of the sky all night. We had the same clouds over most of the sky at home, and could see them on the radar extending all over Southern California (the Internet can be a wonderful tool), and decided that the viewing conditions wouldn't be good enough to justify the gas and time to get out to Anza.

For the first of the star parties, however, we had the best conditions for a star party out at Anza that included running water since November, if my memory serves me correctly. For some unknown reason, however, very few people showed up at Anza to take advantage of the situation. Maybe they were still away on spring break, or believed earlier weather forecasts that indicated that conditions wouldn't be that good. For whatever reason, there was only one family on the Football Field, three people on Ten Pad (though Joe Busch had his solar scope set up there as well), a couple people on the Lower Pads, three people on the Upper Pads, and just Alan and me on Jupiter Ridge – there was nobody that I saw on Mars Hill that night, though John Castillo was out there working on his observatory at the end of Mars Hill. There were five people on the Observatory level plus Rick Wiggins in Star Cruiser and a member who wandered the site without setting up anywhere, so the total attendance at the star party for the entire site was around 20 people. I won't say it was lonely – I enjoyed quite a few visitors in the club observatory – but it was certainly a source of comment.

Oddly enough, it seemed to be a night of equipment challenges. My night at the Kuhn started with the wireless keyboard failing. Usually this can be remedied by putting in new batteries, but not this time. After a lot of changing things around, experiments and testing, it seemed that the wireless transmitter for the keyboard and mouse had failed, or at least it was unwilling to make any attempt to find the keyboard. We ultimately jerryrigged matters by borrowing a keyboard and mouse (both with wires) from other computers in the Observatory. Unfortunately, the mouse that finally did work with the Kuhn only worked intermittently, which was a continuing irritant. However, my problems were as nothing compared to what I was told about other people's problems with guiders, computers, focusing, observatory control, and so on – it was not a good night to ask people how things were going, because the most likely response was a prolonged expression of sheer frustration. We astronomers are an optimistic breed, though, and I noticed that even the most frustrated people there were already planning what to do different for the next time out.

Even though it was the best night we'd had out there for a long time, I noticed that Mars and Saturn were pretty washed out, and I couldn't see much detail in objects like the Owl Nebula. Alan took a time lapse sequence over most of the night, and when he ran it the next day we discovered there had been a lot of high, thin clouds passing overhead most of the night. Looking up through it, it was too thin to see, but it did make a difference in our viewing. Overall, though I thoroughly enjoyed the best viewing I'd had in months and though I'm tempted to say otherwise, I have to admit that those of you who decided not to come didn't miss a really superb night – but it would have been nice to see you out there anyway!

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TOP TWENTY THINGS AN ASTRONOMER SHOULD SEE

#16 The Andromeda Galaxy Naked Eye

By Helen Mahoney

The Andromeda Galaxy (M 31) Naked Eye obviously does not require equipment or advance planning, but it does need a dark sky—and that, unfortunately, is the hard part.

I don't know why I had such a fascination with astronomy as a child. I grew up in Long Beach, California. Even in the days before they installed streetlights in our tract of new houses, there was not much to see in Long Beach due to light pollution. My parents were raised in New York City. They had even worse skies—and almost no interest in astronomy—so my interest didn't come from their influence. But I loved the moon and the constellations, and checked out books to learn more about them.

The Andromeda Galaxy is seen in the middle of this image taken on 4/27/04 along with Comet Bradfield and a meteor. (Wally Pacholka)

When I read about the constellations, I wondered why a person could only see a small fraction of the constellation stars they showed in the books. My child-brain reasoning suspected that there were just fewer stars in the 1950's then there were in the times of ancient Greece. I read about galaxies, too, never expecting I could ever see any.

At the age of eight, I went away to camp for the first time in the mountains near Lake Arrowhead. I volunteered to sleep on the porch of the little tent with the counselor, because I wanted to be able to see the stars as I drifted off to sleep. That first night, after the camp fire and smores, as we walked up the hill to our tent, I could see many more stars than I had ever seen in Long Beach. When all the lights were turned out, I could not believe what I saw. There was a ribbon of light stretching across the sky. I asked the counselor what it was. She replied, "That's a galaxy." That's when I learned to appreciate a dark sky, and to realize that my city did not have one.

Later, I learned that the big ribbon of light was my own galaxy, the Milky Way. It wasn't until years later when someone with more knowledge about the heavens pointed out a fuzzy blob in the northeastern sky. It was the Andromeda Galaxy (M31). Putting binoculars on it confirmed the spiral galaxy shape. They taught me how to "star hop" to find the galaxy. You go off of the point of Cassiopeia with the Alpha star, and move toward Pegasus. The galaxy is about 60% of the way to Delta Andromeda (in the antenna of the "television" that is the great square of Pegasus).

When my husband Doug and I stayed at Tioga Pass Resort, just outside the north gate of Yosemite National Park, we brought our 10 inch LX200, and our 20 x 80 binoculars on the Grandview trapezoidal tripod. We wound up putting on an outreach star party for all the resort guests. We pointed out the Andromeda Galaxy, and all were able to see it naked eye in the wonderfully dark skies of the Eastern Sierra. Then, we had each person look at it through the binoculars, with appropriate oohs and aahs. After that, we let them see it in the LX 200. In this way, we zoomed in on the galaxy, and it was very exciting for everyone. They all marveled afterwards at how they never knew they could see another galaxy naked eye. It still amazes me.
It is a shame that we who live in Orange and Los Angeles counties have to go about 100 miles to see the Andromeda Galaxy and all of the stars the ancient Greeks saw in the constellations. I hope we can preserve our dark sky sites. There are so many beautiful things that should be seen naked eye.

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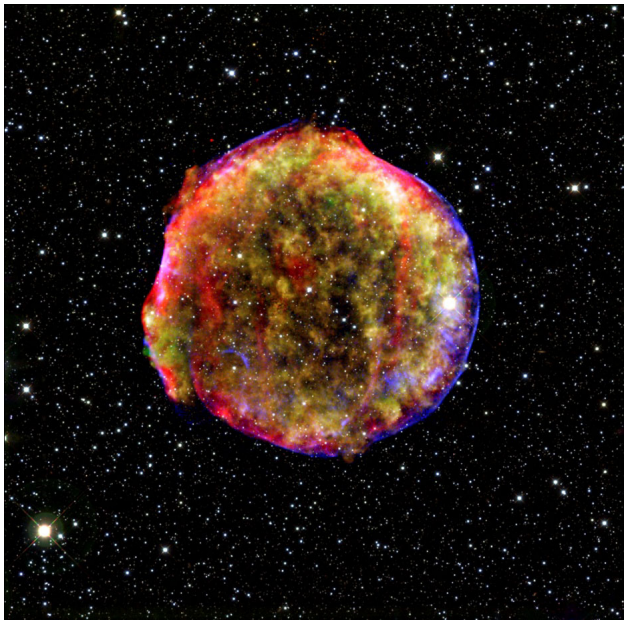
NASA's Space Place

Ancient Supernova Riddle, Solved
By Dr. Tony Phillips

Australopithecus squinted at the blue African sky. He had never seen a star in broad daylight before, but he could see one today. Was it dangerous? He stared for a long time, puzzled, but nothing happened, and after a while he strode across the savanna unconcerned.

Millions of years later, we know better. That star was a supernova, one of many that exploded in our corner of the Milky Way around the Pliocene era of pre-humans. *Australopithecus* left no records; we know the explosions happened because their debris is still around. The solar system and everything else within about 300 light-years is surrounded by supernova exhaust—a haze of million-degree gas that permeates all of local space.

Supernovas are dangerous things, and when one appears in the daytime sky, it *is* cause for alarm. How did Earth survive? Modern astronomers believe the blasts were too far away (albeit not by much) to zap our planet with lethal amounts of radiation. Also, the Sun's magnetic field has done a good job holding the hot gas at bay. In other words, we lucked out. The debris from those old explosions has the compelling power of a train wreck; astronomers have trouble tearing their eyes away. Over the years, they've thoroughly surveyed the wreckage and therein found a mystery—clouds of hydrogen and helium apparently too fragile to have survived the blasts. One of them, whimsically called "the Local Fluff," is on the doorstep of the solar system.



Left-over cloud from the Tycho supernova, witnessed by Tycho Brahe and other astronomers over 400 years ago. This image combines infrared light captured by the Spitzer Space Telescope with x-rays captured by the Chandra X-ray Observatory, plus visible light from the Calar Also Observatory in Spain.

"The observed temperature and density of the Fluff do not provide enough pressure to resist the crushing action of the hot supernova gas around it," says astronomer Merav Opher of George Mason University. "It makes us wonder, how can such a cloud exist?" NASA's Voyager spacecraft may have found the answer. NASA's two Voyager probes have been racing out of the solar system for more than 30 years. They are now beyond the orbit of Pluto and on the verge of entering interstellar space. "The Voyagers are not actually inside the Local Fluff," explains Opher. "But they are getting close and can sense what the cloud is like as they approach it."

And the answer is …

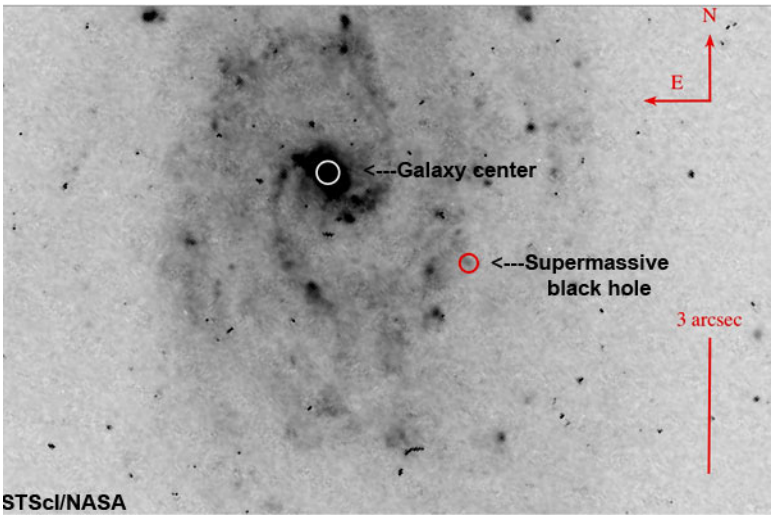
"Magnetism," says Opher. "Voyager data show that the Fluff is strongly magnetized with a field strength between 4 and 5 microgauss. This magnetic field can provide the pressure required to resist destruction." If fluffy clouds of hydrogen can survive a supernova blast, maybe it's not so surprising that we did, too. "Indeed, this is helping us understand how supernovas interact with their environment—and how destructive the blasts actually are," says Opher.

Maybe *Australopithecus* was on to something after all.

Opher's original research describing Voyager's discovery of the magnetic field in the Local Fluff may be found in *Nature*, **462**, 1036-1038 (24 December 2009). The Space Place has a new Amazing Fact page about the Voyagers' Golden Records, with sample images and sounds of Earth. Just in case one of the Voyager's ever meets up with ET, we will want to introduce ourselves. Visit http://spaceplace.nasa.gov/en/kids/voyager.

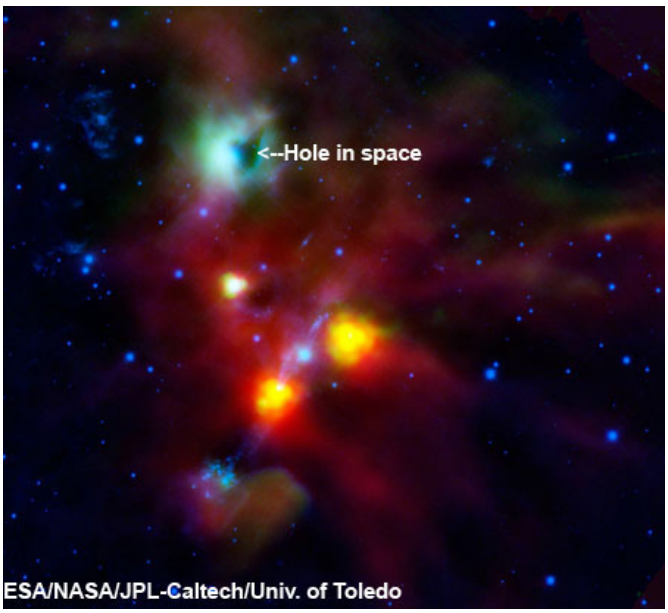
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

AstroSpace Update
June 2010
Gathered by Don Lynn from NASA and other sources



Runaway black hole – A college student in the Netherlands has discovered what appears to be a supermassive black hole that has been ejected from the center of its galaxy. Theoreticians who work with computer simulations of galaxy mergers have predicted that a merger should sometimes do this to the black hole found in the center of nearly every galaxy, but this is the first time one has been caught running away. The discovery was made by comparing the locations of hundreds of thousands of X-ray sources with the positions of millions of galaxies. There are a couple of other ways that X-rays this bright can be produced, but the observations best fit a supermassive black hole. More candidates have been found for runaway black holes with this study, and X-ray data pinpointing their locations will be taken to confirm these.

Missing matter – The density of ordinary matter (made of protons and neutrons) can be calculated from measurements of the cosmic microwave background. But the amount of matter seen is only about half this density. It is believed that most of the rest, so-called missing ordinary matter, is composed of hot gas between galaxies, and in some places that gas has been seen in X-rays. A new technique has been used to observe more of that hot gas. Chandra and XMM-Newton (orbiting X-ray observatories) have been used to observe some distant (2 billion light-years) quasars as they shine through a closer (400 million light-years) wall of galaxies. The hot gas between the galaxies is detected by its absorption of X-rays from the quasars. This is strong support that much of the missing matter is such hot gas.



Herschel (far infrared space telescope) has observed a dark spot in the sky next to the nebula NGC 1999, thought to be dust or gas obscuring any stars, but instead found it was empty. Dust would have appeared bright in infrared. Astronomers think that the hole must have been created when the narrow jets of gas from some of the young stars in the area punctured the sheet of dust and gas that forms NGC 1999. The radiation from a nearby star may also have helped to clear the hole.

Early **Herschel** results are revealing previously hidden details of star formation. New images show thousands of distant galaxies furiously building stars. Herschel's observation of the star-forming cloud RCW 120 has revealed an embryonic star which looks ready to turn into one of the biggest and brightest stars in our galaxy within the next few hundred thousand years. It already contains 8-10 times the mass of our Sun and is still surrounded by an additional 2000 solar masses of gas and dust from which it can feed further. Current theories of star formation have been unable to explain how stars larger than 8 solar masses can form. The light emitted by such large stars should blast away their birth clouds, stopping further mass accumulation. Larger stars are

known to exist, so the theory must be revised. Further observations of this star may help this. Herschel has also been surveying deep space beyond our Milky Way, and has measured the infrared light from thousands of other galaxies. The infrared brightness of galaxies allows astronomers to determine the rate of star birth within. It had been thought that star formation rates have remained steady for the last 3 billion years. But Herschel observations show this is not true. The rate has now been shown to be much greater earlier in this period. Herschel is the largest astronomical telescope ever placed into space.

Most distant galaxy cluster – Scientists have found a very distant cluster of galaxies, which was determined by spectra to be so far away that its light left there 9.6 billion years ago. So we are seeing it as it was 9.6 billion years ago. This is the most distant known galaxy cluster. It is generally thought that so early in the history of the Universe galaxies were much smaller than today, and that it took billions of years of merging of these small galaxies to produce the largest galaxies we see today. However, the newly found galaxy cluster is dominated by old red massive galaxies, several with 10 times the number of stars as our Milky Way galaxy. Astronomers still think the theory of building up galaxy size over billions of years is correct, but that this cluster is an exception. Finding more galaxy clusters this distant will tell if that is true.

Runaway star – Astronomers have found a massive star rushing away from a stellar nursery in the Tarantula Nebula in the Large Magellanic Cloud at over ¼ million mph. It is 375 light-years away from its probable birthplace in the giant star cluster R136. A cavity swept out by the moving star was found pointing back toward R136. A runaway star can happen in 2 ways: it gets whipped away by the gravity of 2 or more massive stars, or it gets blown away by a supernova. Because R136 is so young, it is unlikely to have had any supernovas yet. So this newly found star was probably ejected by a gravitational encounter. Less massive runaway stars were first seen over half a century ago in the smaller Orion Nebula, but this is the first find of such a massive runaway star. From the strength of its stellar wind and its high temperature, it is likely 90 times the mass of the Sun. Two other massive stars have been spotted nearby, and further observations will be made to determine if they are also runaways from the Tarantula Nebula.

Spitzer (infrared space telescope) has discovered that the atmosphere of the exoplanet GJ 436b lacks methane, a common ingredient in planetary atmospheres. Computer simulations of planetary atmospheres predict methane as well as a little carbon monoxide should be produced by the conditions there. Instead the Spitzer measurements showed more carbon monoxide and no detectable methane. GJ 436b is 33 light-years away in Leo, orbiting its small star every 2.64 Earth days, with a temperature of about 980° F. The planet is eclipsed by its star periodically. The planet and star are too close to be resolved separately, but the spectrum of both is compared to the spectrum of the star alone (during eclipse) in order to get the spectrum of the planet alone.

Cassini (Saturn mission) in May is making a double flyby of moons Enceladus (at a distance of 270 miles from its surface) and Titan (at 750 miles). This is only the 5th double flyby out of more than 100 flybys that have occurred in the 6 years of orbiting Saturn. The goal of the Enceladus flyby is to watch the Sun pass behind the water-rich plume of geyser activity and search for the spectrum of nitrogen. The amount of nitrogen will give scientists clues about processes in the moon's interior. Radio science will be performed during the Titan flyby, which measures the spacecraft position extremely accurately. From this scientists can calculate the internal structure of Titan, and possibly whether it has a liquid ocean under the surface. Also the composite infrared spectrometer will get its southernmost pass for thermal data to fill out its temperature map of Titan.

It appears that flash flooding has paved streambeds in the Xanadu region of **Titan** with rounded rocks of ice. By analyzing Cassini radar reflections from the terrain, scientists deduce the spheres measure at least a few inches and maybe up to a couple of yards in diameter. The spheres likely originated as water-ice bedrock in higher terrain. What happened is probably like what creates polished river rocks on Earth. Flash floods on Earth pick up boulders and debris and tumble them downstream to form rounded rocks. The process on Titan involves rain of methane and rocks of water ice on a surface that is about minus 290 °F. Earth-like river rocks had already been observed by the Huygens probe in another region of Titan. But the channels in Xanadu looked brighter in radar than the Huygens landing area, implying even more rounded ice rocks which are highly

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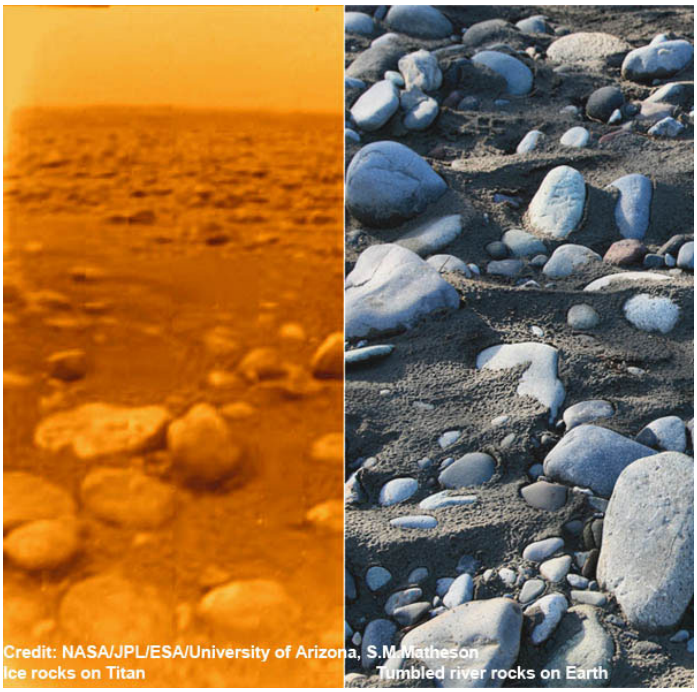
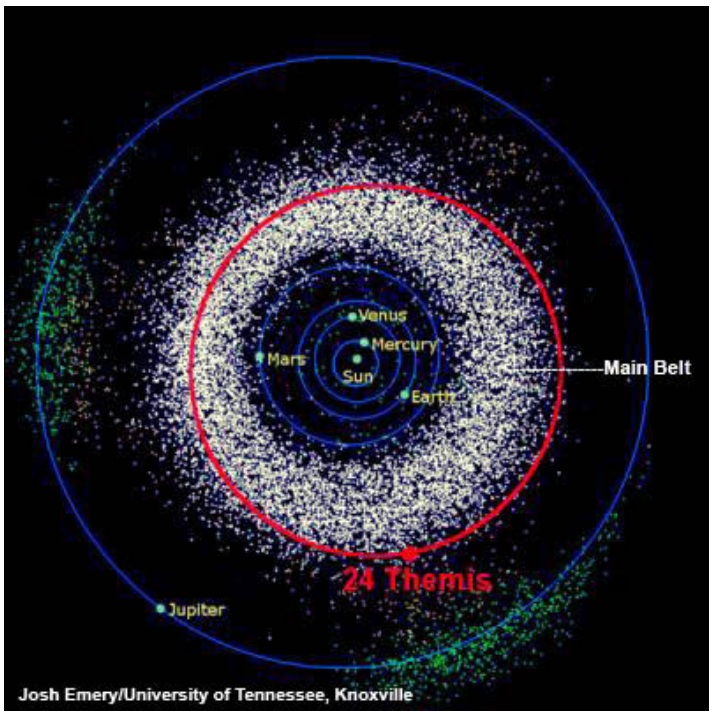
reflective in radar. Xanadu may be an especially good gem grinder because of its broad expanse and gentle southward slope. Flows could travel long distances (hundreds of miles) there.



Observations of how **Enceladus** interacts with its environment show it leaves a complex pattern of ripples and bubbles in its wake. Enceladus is deep within Saturn's magnetosphere, which is filled with electrically charged particles, called plasma. Cassini took data on the plasma during 9 flybys of Enceladus, and found the ripples and bubbles. Measurements show that the moon and its geyser plume are continuously soaking up the plasma, which rushes past at about 20 miles per second, due to Enceladus's orbiting. This leaves a cavity downstream. Dust and gas emitted by the moon are also being charged and forming new plasma. As the material readjusts to the cavity and new plasma, it does not do so in a smooth fashion, but forms the ripples and bubbles. Enceladus is the source of most of the plasma in Saturn's magnetosphere. Scientists will look at data from flybys of other Saturnian moons to see if similar patterns are found in their wakes.

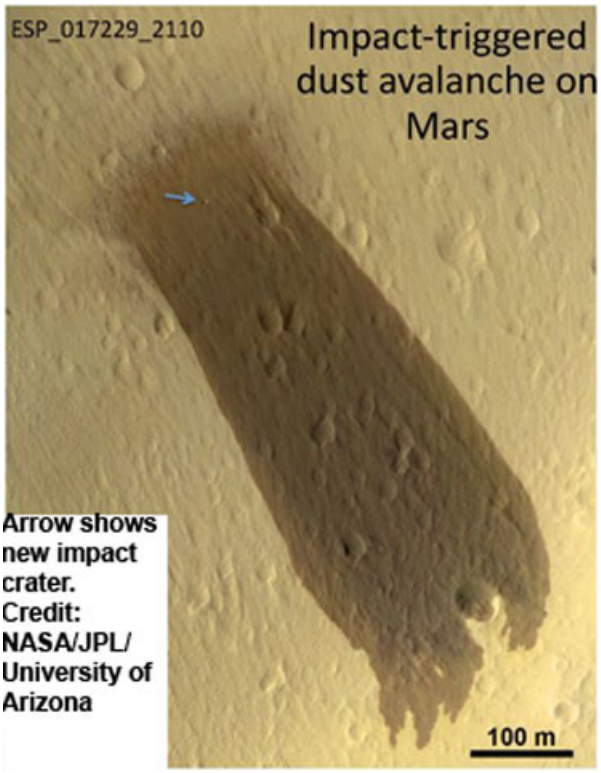
X-51 (hypersonic scramjet) is scheduled for its 1st of 4 long-duration test flights in late May. It will be dropped from a B-52 aircraft at about 49,000 feet, accelerated up to its operating speed by a solid rocket, then fly for 5 minutes up to Mach 6.5 (over 4000 mph). Hypersonic jets, in which the air flowing through the engine remains above the speed of sound, have been tested in the past, but only for a few seconds. Theoretically scramjets could fly to the edge of space and achieve 60% of orbital speed, all without carrying oxidizer (as rockets must do). Such would make a very efficient 1st or 2nd stage for a vehicle to launch satellites to Earth orbit. If a scramjet can transition to using tanked oxygen when the atmosphere is left behind, turning it into a rocket, it would be possible to achieve orbit with only that stage. No one has been willing to spend the money to develop a working scramjet except the military, which sees application to deliver weapons to anywhere on Earth in an hour or so. If the military develops a successful scramjet with the X-51 and follow-ons, then a few years later we should see its use in launching satellites. The X-51 is a waverider, which develops lift from its own supersonic shockwave, due to the vehicle's shape. It is 26 feet long and weighs 1 ton.



Themis – Researchers have found evidence (in infrared spectrum) of water ice and carbon compounds on Themis, an asteroid with a diameter of 123 miles. It is thought to be a thin film covering the surface. Asteroids in the main belt between Mars and Jupiter, including Themis, were thought to be warm enough that any exposed ice would soon be lost. This implies the ice is being replenished, possibly from an internal reservoir of ice that outgases and coats the surface. Internal ice would also be surprising, because main belt asteroids were thought to be rocky internally, not icy. This is based on density measurements and formation theory. This may mean that asteroids with internal ice are

more common than thought, but more observations will be needed to establish this.

Phoenix (Mars lander) – In late May the Mars Odyssey orbiter is scheduled to listen once again for radio signals from the Phoenix lander. Attempts from January to April were not successful. The May attempt will be the last, and was scheduled to coincide with the maximum sunlight on Phoenix. It was expected that the harsh winter conditions very far north on Mars would have permanently damaged Phoenix, but listening was performed in case it somehow survived. Phoenix worked superbly up until November 2008, when insufficient sunlight on its solar panels caused it to stop transmitting.



Arrow shows new impact crater. Credit: NASA/JPL/ University of Arizona

Mars Reconnaissance Orbiter has captured several Martian avalanches, but the latest one was caused by an impact. The dust avalanche created a streak on the slopes of Olympus Mons, the solar system's largest volcano. Scientists believe some of the previous avalanches seen on Mars occur due to the expansion and contraction of ice from seasonal temperature changes. The crater that started the avalanche is about 15 feet across, implying that the meteorite causing it was about a half yard wide. A few previous dust avalanches have been caused by passing dust devils.

Voyager 2 (outer planet mission, now exploring the outer heliosphere) in late April developed a problem in the scientific data that it is transmitting to Earth. The problem does not affect the engineering data (which describes spacecraft operations). Operators believe that a bit or 2 of memory in the spacecraft computer got changed, possibly by radiation. They are sending a copy of the memory contents to Earth to analyze the problem. Hopes are high that normal operation can be soon restored. Voyager 2 is so far away that it takes radio signals 13 hours to travel between Earth and the spacecraft. Voyager 2 and its sister ship, both launched in 1977, have enough propellant and electrical power to operate until at least 2020.

Uncontrolled satellite – A geostationary satellite named Galaxy 15 had its computer fried by a solar flare and has stopped communicating with controllers, but continues to relay communications. Other than loss of its capability, this would not be a problem, except that it is drifting out of position and will get into the path of communications being sent to other satellites, resulting in interference. This zombie state has never occurred before, and the satellite operator is asking for advice on handling it. Attempts were made early in May to blast shutdown commands into Galaxy 15, but they were unsuccessful. It is predicted that in July or August the satellite will lose orientation toward the Sun, causing a loss of solar panel power, which will finally shut it down.

Orion (next manned space vehicle) – NASA successfully tested the abort system developed for the Orion crew vehicle, the first such escape system developed since Apollo. It would blast the crew module free of its rocket in the case of an emergency during launch. It uses a solid-fuel rocket to accelerate to 450 mph in 2.5 seconds, then parachutes to safety. The Orion vehicle is the only part of the Constellation-Ares program that President Obama has not targeted for cancellation.

Unusual micrometeorites – Scientists searching through Antarctic snow have found micrometeorites with a surprise: two particles contain extremely large amounts of carbon and excess deuterium (heavy hydrogen). High carbon and deuterium content usually comes from interstellar space, but other content (crystalline materials) in the particles implies these formed in the solar system. The particles were found by workers at the Concordia polar station in snow that is 40 to 55 years old.

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them. The co-ordinator is Mike Bertin and the meetings are held at my house in Anaheim. we have about an hour or of discussion and then go out and observe. We set up the telescopes in the backyard before the discussion so they have time to acclimate to ambient temperature before we adjourn outside.

There is also the Astroimagers group where those members who do imaging meet to discuss, learn about taking and processing astronomical photos, and showing off our work. The AI SIG as it is commonly called meets at the offices of Gibson Dunn and Crutcher on the 3rd Tuesday of every month. Check the Web site for information about upcoming meetings.

Our Last SIG devotes itself to remote telescope operations and is called appropriately the RT or Remote telescope SIG. The goal of this SIG is to provide a mid-size automated instrument for local use from the comfort of the trailer at the Anza site. Later, the RT as it is know would be made available for remote use and automated surveys when not being used by OCA astronomers at the Anza site. The group meets at COCO's restaurant at 14971 Holt Avenue,Tustin just East of the 55 Freeway. You will usually find the group in the back dining room seated at the corner booth table for 8.

Our last group is not a SIG per se, but it holds a special place in my heart. It is the Outreach group and it where the OCA meets the public at large. The Outreach program is run by Jim Benet and he organizes local star parties for schools and parks throughout the County. As a frequent participant I can say there are few things in our hobby that bring as good a feeling as showing a child or even an adult their first look through a telescope. The "oohhhs and Ahhhs" you will get are without compare. You don't need a big expensive scope, just the enthusiasm to share your love of the sky with others. Jom is always looking for volunteers and if you are interested get in touch with him and let him know. You'll be welcomed warmly by Jim, the other outreachers and the people who have gathered to look through your telescope.

Until next month, Clear Skies....

Instant AstroSpace Updates

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Akatsuki (Venus orbiter) and **Ikaros** (solar sail) are scheduled to launch late May together on one rocket from the Japanese Tanegashima Space Center. Akatsuki means dawn, and it formerly was known as Venus Climate Orbiter or Planet-C.

Mars rover **Opportunity** has traveled 4.5 miles on its way to Endeavour Crater, a distance of 7.5 miles in a straight line, but 12 miles by the route chosen to avoid dangerous terrain. It was originally planned to take about 2 years to make it to Endeavour, but stops for interesting study targets will probably make it a year late (fall 2011).

The site to build the **European Extremely Large** (42 meter diameter) **Telescope** has been chosen as a mountain in the Atacama desert of Chile near the Paranal Observatory.

A proposal has been made to split the preliminarily planned **Mars sample return** mission into 3 missions in order to reduce cost and risk: a rover to collect samples, a lander to pick up the samples and launch into orbit, and an orbiter to intercept the sample and return it to Earth. It is hoped that a sample return would settle whether life has ever existed on Mars.

Wanted: Old style 84-key AT keyboard for DOS/Windows PC (the kind with the function keys on the left instead of above the other keys). Tim Hogle timhogle@aol.com, (626) 357-7770.

For Sale: Celestron C8-SGT 8" Advanced Series Telescope (the C8 has XLT optics) with the latest version of hand control computer and includes a Telrad and the Celestron Auxiliary Port Accessory for firmware upgrades. $975. Contact: Vance Tyree at 626-355-7210 or tyree@isi.edu

Observing Pad Lease for Sale! Location: Easternmost pad on top tier of Mars Hill. Largest Observing Pad at Anza, electricity, polar aligned pier, 2 work tables, adjacent parking, good neighbors. Contact: Tom Kucharski Cell: 949-683-8356

For Sale: Meade LXD55 with all accessories, as listed below. All items have never been used and are in original packaging:

1-Tele: Meade LXD55 6" F/8 Achromatic Refractor	
1- Meade LXD55 Equatorial Mount and Tripod	$990.00
1- Meade #3200 Lunar and Planetary Filter Set	$40.00
1- Meade Series 4000 8mm-24mm Zoom Eyepiece	$219.95
1- Meade Basic Camera Adapter	$45.00
1- Meade Color Filter Set #1	$55.00
1- Meade 547 AC ADAPTER	$95.00
1- Meade Series 4000 #140 2x Apochromatic Barlow Lens (1.25")	$85.00
1- Meade #905 Variable Polarizing Filter (1.25")	$50.00
1- Meade SKYCHART &505 Cable	$50.00
1- Meade Accessory Case	$100.00
	$1729.00

For incentive purposes I will knock off $100 for a total price of $1629.00 , and include a free accessory case.
I will knock 100.00 dollars off the final price and include a free accessory case!

Remember everything is new and never been used!
Gary Liss
1-714-636-8236
its4gary@pacbell.net

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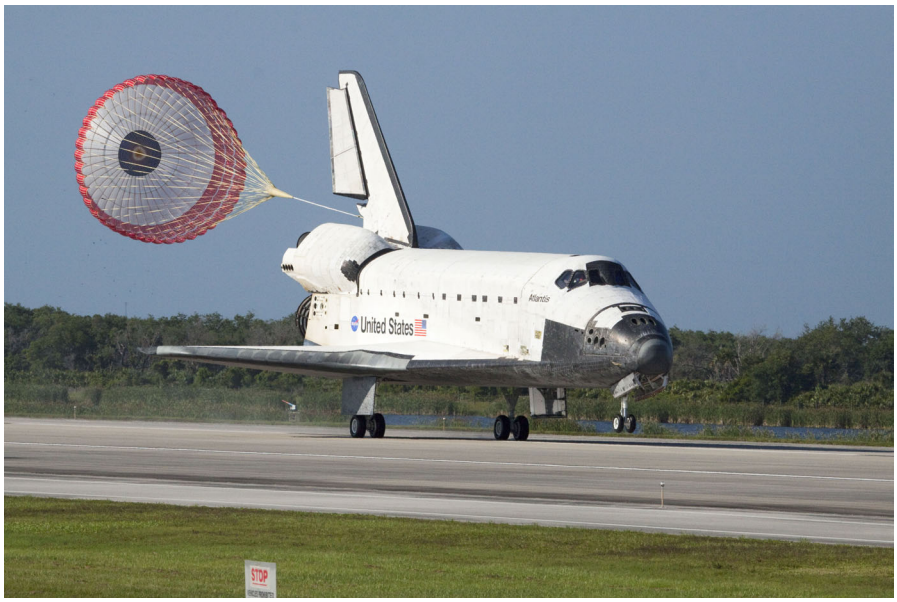
The **space shuttle** Atlantis is delivering science experiments and a new Russian laboratory to the International Space Station, in its last scheduled flight before retirement. The lab, named Rassvet (dawn in Russian), will host biotechnology, biological science, fluid physics and educational experiments.

NASA-sponsored studies have shown that omega-3 fatty acids found in fish oil mitigates **bone breakdown** that occurs during spaceflight and in osteoporosis. Data for the study came from cell cultures, ground-based studies, and from Shuttle and Space Station crew members. ■



Space Shuttle Atlantis returning from its 32nd and final mission, May 26, 2010 (NASA)

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