SIRIUS ASTRONOMER

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The Newsletter of the Orange County Astronomers

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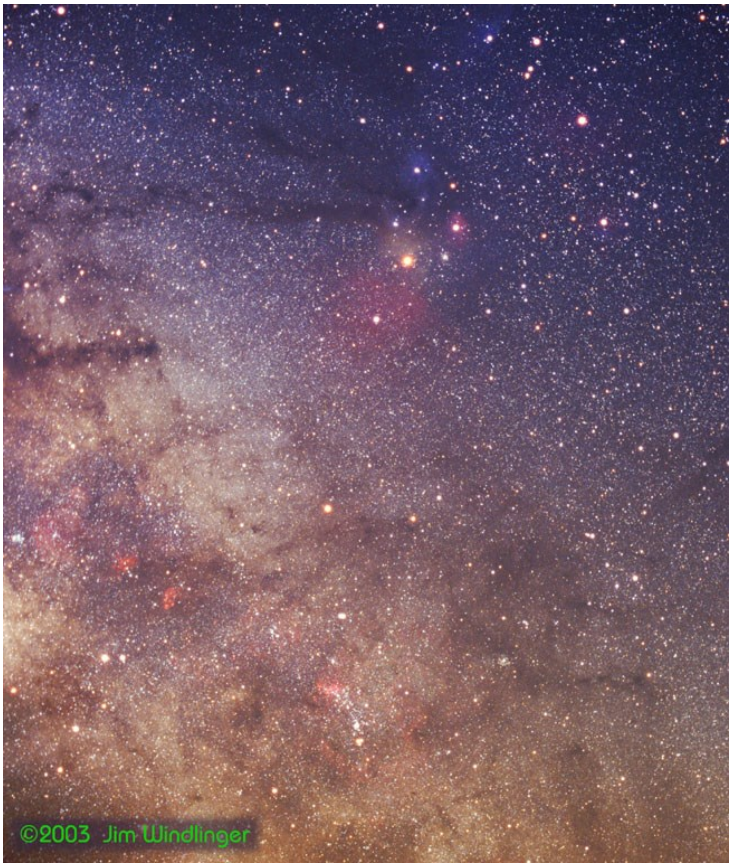


Scorpius, along with its eastward neighbor Sagittarius, is one of the showpiece constellations of the summer. Unlike many constellations it bears a very striking resemblance to its namesake, the scorpion. To the west, the faint constellation Libra—considered by the ancient Babylonians and Greeks as the claws of Scorpius—may be found.

OCA CLUB MEETING

The free and open club meeting will be held June 13 at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. This month's speaker is yet to be announced at press time.

NEXT MEETINGS: July 11, August 8

STAR PARTIES

The Black Star Canyon site will open on June 21. The Anza site will be open on June 28. 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 at the Heritage Museum of Orange County at 3101 West Harvard Street in Santa Ana on June 6. The following class will be held August 1.

GOTO SIG: TBA
Astro-Imagers SIG: June 10, July 8
Remote Telescopes: TBA
Astrophysics SIG: June 20, July 18
Dark Sky Group: TBA

The Hottest Planet in the Solar System

By Dr. Ethan Siegel

When you think about the four rocky planets in our Solar System—Mercury, Venus, Earth and Mars—you probably think about them in that exact order: sorted by their distance from the Sun. It wouldn't surprise you all that much to learn that the surface of Mercury reaches daytime temperatures of up to 800 °F (430 °C), while the surface of Mars never gets hotter than 70 °F (20 °C) during summer at the equator. On both of these worlds, however, temperatures plummet rapidly during the night; Mercury reaches lows of -280 °F (-173 °C) while Mars, despite having a day comparable to Earth's in length, will have a summer's night at the equator freeze to temperatures of -100 °F (-73 °C).

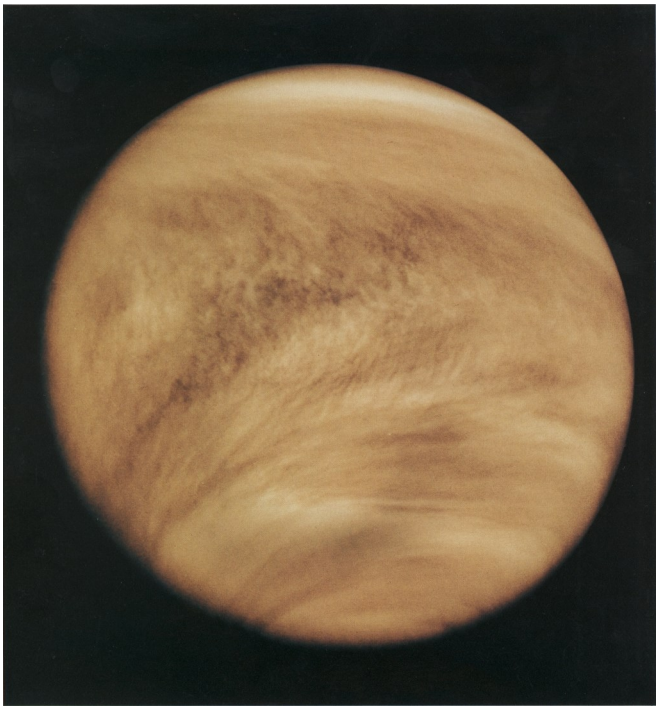


Image credit: NASA's Pioneer Venus Orbiter image of Venus's upper-atmosphere clouds as seen in the ultraviolet, 1979.

Those temperature extremes from day-to-night don't happen so severely here on Earth, thanks to our atmosphere that's some 140 times thicker than that of Mars. Our average surface temperature is 57 °F (14 °C), and day-to-night temperature swings are only tens of degrees. But if our world were completely airless, like Mercury, we'd have day-to-night temperature swings that were *hundreds* of degrees. Additionally, our average surface temperature would be significantly colder, at around 0 °F (-18 °C), as our atmosphere functions like a blanket: trapping a portion of the heat radiated by our planet and making the entire atmosphere more uniform in temperature.

But it's the *second* planet from the Sun -- Venus -- that puts the rest of the rocky planets' atmospheres to shame. With an atmosphere **93 times as thick as Earth's**, made up almost entirely of carbon dioxide, Venus is the ultimate planetary greenhouse, letting sunlight in but hanging onto that heat with incredible effectiveness. Despite being nearly twice as far away from the Sun as Mercury, and hence only receiving 29% the sunlight-per-unit-area, the surface of Venus is a toasty 864 °F (462 °C), with *no difference* between day-and-night temperatures! Even though Venus takes hundreds of Earth days to rotate, its winds circumnavigate the entire planet every four days (with speeds of 220 mph / 360 kph), making day-and-night temperature differences irrelevant.

Catch the hottest planet in our Solar System all spring-and-summer long in the pre-dawn skies, as it waxes towards its full phase, moving away from the Earth and towards the opposite side of the Sun, which it will finally slip behind in November. A little atmospheric greenhouse effect seems to be exactly what we need here on Earth, but as much as Venus? No thanks!

Check out these "10 Need-to-Know Things About Venus": http://solarsystem.nasa.gov/planets/profile.cfm?Object=Venus.

Kids can learn more about the crazy weather on Venus and other places in the Solar System at NASA's Space Place: http://spaceplace.nasa.gov/planet-weather.

AstroSpace Update

June 2014

Gathered by Don Lynn from NASA and other sources

Habitable zone exoplanet – Using the Kepler Space Telescope, astronomers have discovered the 1st Earth-size planet that orbits in the habitable zone of another star. The planet, named Kepler-186f, orbits an M dwarf, or red dwarf, a class of stars that makes up 70%of the stars in our Milky Way galaxy. The habitable zone is defined as the range of distances from a star where liquid water might occur on the surface of an orbiting planet. While planets have previously been found in habitable zones, the previous finds are all at least 40% larger in size than Earth. Kepler-186f orbits its star once every 130 days and receives considerable less energy than Earth, placing it near the outer edge of its habitable zone. The temperature on the planet depends on what kind of atmosphere it has, which is unknown now. Its composition is unknown, but planets about the size of Earth are believed to be rocky planets. It lies about 500 light-years away. The system is also home to 4 other planets that are closer to their sun and take 4-22 days to orbit. They are too hot to be in the habitable zone. These 4 all measure less than 1.5 times the size of Earth.

Exoplanet rotation – Observations from the Very Large Telescope (VLT) in Chile have, for the 1st time, determined the rotation rate of an exoplanet. Beta Pictoris b was found to have a day that lasts only 8 hours. This is quicker than any planet in the Solar System. The equator of this exoplanet is moving at almost 60,000 mph (100,000 km/hr). Beta Pictoris is a naked-eye star which lies about 63 light-years away. The planet orbiting it was discovered nearly 6 years ago and was one of the 1st exoplanets to be directly imaged. It orbits at a distance from its star of 8 times the Earth-Sun distance, making it the closest planet to its star to be imaged. The exoplanet is more than 16 times as large and 3000 times as massive as the Earth. It is a very young planet, only about 20 million years old. Over time, it is expected to cool and shrink, which will make it spin even faster, unless other forces slow it down by then. The new measurement was made of the Doppler shift in the planet's spectrum caused by the edges approaching and receding from us, due to rotation. The measurement was made with adaptive optics to counteract the movements of the image caused by our atmosphere.

Gamma-ray burst polarization – A team of scientists has discovered that gamma-ray bursts (GRBs) behave differently than previously thought. GRBs (at least the longer-lasting kind) take place in galaxies far away when a massive star collapses at the end of its life. These GRBs are followed by a so-called afterglow, slowly fading emissions at many wavelengths, including visible light, for a few days to weeks. We know that the afterglow is formed by a shock wave, moving at very high speed, in which electrons are being accelerated to tremendous energies. These electrons then produce the afterglow light that we detect. Different theories for electron acceleration all predict different levels of linear polarization of the light, but theories all agreed that there should be no circular polarization in visible light. Newly analyzed observations of the afterglow of GRB 121024A showed circular polarization. Theorists need to guess again how the electrons are accelerated.

Supernova explained – Most supernova explosions shine with a known intrinsic brightness. But a supernova detected in August 2010 by the Pan-STARRS-1 telescope in Hawaii appeared too bright. The supernova, PS1-10afx,

erupted 9 billion years ago, and its light took this long to arrive. It shone more brightly than expected for its distance. A new study presented by Robert Quimby (former OCA member) and colleagues reports evidence of an intervening gravitational lens, a galaxy between us and PS1-10afx that had eluded previous attempts to find (since a gravitational lens was one possible explanation for the excess brightness). The supernova was determined to be an ordinary Type Ia, the death cry of a white dwarf star. The other leading theory was that it was a superluminous supernova, but that is now denied. The new observations used the Keck Telescope in Hawaii to find a 2nd set of emission lines imposed on the supernova's galaxy's spectrum, with redshift showing the 2nd object was closer. It was dimmer than the farther galaxy, and therefore hard to detect. The team wants to test cosmic expansion, since multiple images of a supernova through a gravitational lens will arrive at different times, and the time delay depends on the rate of expansion of the Universe.

Unusual supernova remnant – Astronomers have identified a supernova remnant that has swept up a remarkable amount of material. It also has a different shape in radio data compared to that in X-rays. The supernova remnant is called G352.7-0.1 and is located about 24,000 light-years from Earth. A supernova explosion hurls remains of the shattered star into space. As this debris field, called the supernova remnant, expands, it carries along material that it encounters. This remnant has swept up the equivalent of about 45 times the mass of the Sun. Most of its radio emission is shaped like an empty ellipse, but its X-ray emission fills in the center of the radio ellipse. A recent study suggests, surprisingly, that the X-ray emission in G352 is dominated by the hotter debris from the explosion, rather than cooler emission from the swept up material. This is curious because astronomers estimate the G352 exploded about 2200 years ago, and supernova remnants of this age usually produce X-rays that are dominated by swept-up material. Scientists are still trying to explain this behavior.

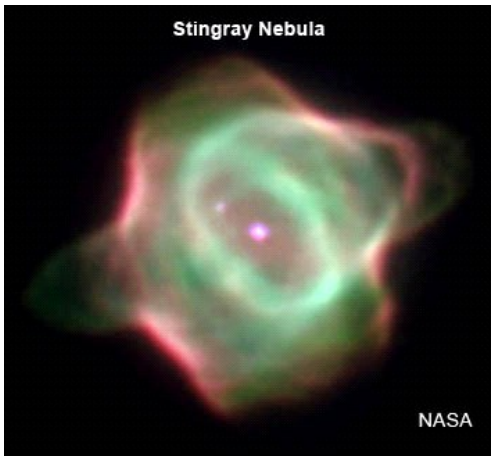
Gravitational lensing – Distant exploding supernovas observed by the Hubble Space Telescope are providing astronomers with a powerful tool to determine the strength of naturally-occurring gravitational lenses. 3 such supernovas have been observed through gravitational lenses, caused by massive galaxy clusters in front of the explosions. Because the absolute brightness of the supernovas can be determined from knowing the characteristics of the blast, the amount of magnification can be calculated. In all cases the result agreed with theoretical models of the amount and distribution of mass causing the lensing. Astronomers would like to find more supernovas behind a single gravitational lens (the 3 studied were behind 3 different lenses), as this would allow better understanding of the lumpiness of dark matter within a galaxy cluster.

Hypervelocity cluster – Galaxy M87 has thrown an entire star cluster out at more than 2 million mph (3 million km/hr). The newly discovered cluster, which astronomers named HVGC-1, is on course to drift through space between galaxies for all time. Stars have occasionally been seen to be moving so fast they are escaping their galaxies (called hypervelocity stars), but this is the 1st entire cluster doing so. The giant M87 is known to have thousands of globular clusters. A recent study of many of those globulars by the MMT telescope in Arizona turned up this one moving faster than the rest. Several explanations are possible how this cluster was thrown out at such high speed, and the leading one is that there are not 1, but 2 supermassive black holes at the heart of M87. Gravitational interactions of 2 black holes and a globular could easily strip some of the stars off a globular and hurl the remainder at high speed. It will take more observations to confirm or deny this theory.

Globular rotation – Astronomers recently found stars at the centers of old globular star clusters rotating around a common axis rather than in random orbits. Theory dictated that interactions should randomize the directions of star orbits. Yet the recent study of 11 globulars found all of them had a central group rotating around a common axis. However, the 11 globular clusters studied so far do not include any so-called "core-collapsed" globulars. Core collapse is a process that might eradicate common rotation. Future observations are planned on 16 more globulars should shed light on this and other questions, such as a possible correlation between the rotation found and the position of a globular inside our galaxy.

Sun's sibling – A team of researchers has identified the 1st known sibling of the Sun, that is, a star that was almost certainly born in the same cloud of gas and dust as our star. The star, known as HD 162826, is somewhat too dim to be seen naked eye. It is 15% more massive than out Sun, located 110 light-years away in Hercules. The team identified HD 162826 by following up on 30 possible candidates. 23 of the candidates were studied in depth with ground-based telescopes, using high-resolution spectroscopy and measuring their orbits within the Milky Way. Considering the composition and orbits, only this star appeared to be born with the Sun. Initial searches for planets found none, but this search only ruled out large, fairly closely orbiting planets. Future data from the Gaia space telescope will provide accurate distances and motions for a billion stars, allowing astronomers to search for other solar siblings. The methods developed in this study should speed up the process of winnowing a solar sibling from the massive amount of Gaia data. This study found which elements are key to distinguishing dissimilar stars.

Star formation – Using data from the Chandra X-ray space telescope and infrared telescopes, astronomers showed that previous notions of how star clusters are formed cannot be correct. The simplest idea was that stars form into clusters when a giant cloud of gas and dust condenses. The center of the cloud pulls in material from its surrounding until it becomes dense enough to trigger star formation. This process occurs in the center of the cloud 1st, implying that the stars in the middle of the cluster form 1st and therefore are the oldest. However, researchers studying 2 clusters where Sun-like stars are forming (in the Flame Nebula and the Orion Nebula) discovered the stars on the outskirts of the clusters actually are the oldest. Chandra brightness data was used to determine masses of stars. Infrared data combined with theoretical models gave estimates of stars' ages. At the center of the Flame cluster, stars were about 200,000 years old, while those on the outskirts were about 1.5 million years old. Star in Orion were 1.2 million years in the middle and almost 2 million years near the edges. 3 notions have been expressed to explain this: 1) star formation continues in the inner regions, but star formation ceases in the outer regions, where there is less material, leading to a concentration of younger stars in the middle; 2) old stars drift away from the center or are kicked outward by interactions with other stars; 3) young stars are forming in the filaments falling into the centers. Planned observations are to see if the older-outer relation exists in other young clusters.

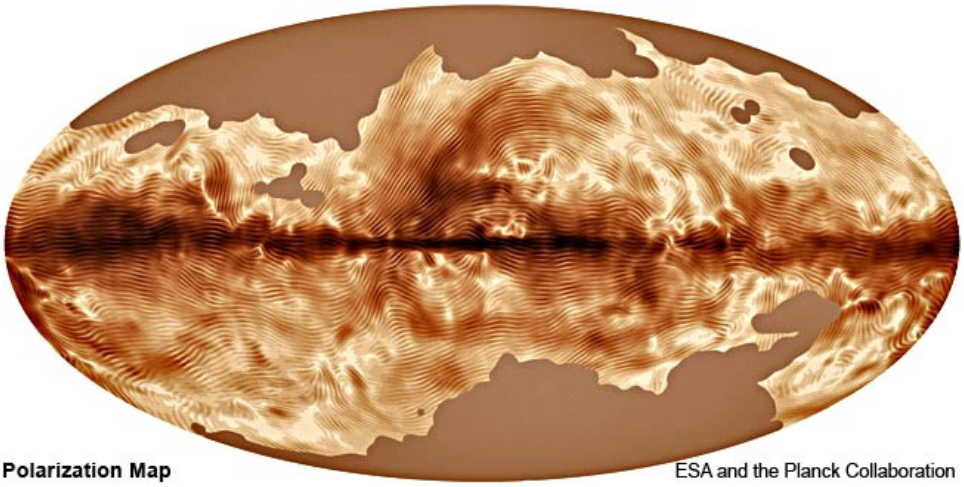


Evolving star – Stars and galaxies tend to evolve on time scales much longer than human experience. But SAO 244567, a star in the Stingray Nebula, has been changing behavior over the last few decades, increasing rapidly in temperature and losing an incredible amount of mass. Astronomers speculate that not only are we watching this star evolve in real time, but we may be directly seeing its helium-shell flash. The Stingray is the youngest planetary nebula known. These stellar remnants are not related to planets, but are created when the outer layers of a dying star blow off and expand into

space. With a size of 1/6 light-year across (1/10 the size of most planetary nebulas) it has been expanding for a relatively short time. Observations in 1971 gave a temperature of 21,000°K for the central star, but in 2002 it was as high as 60,000°K. An increase in temperature this high over such a short time is unheard of. The team thinks the star's jump in temperature and huge stellar winds are signs of a helium-shell flash. Stars initially produce energy by fusing hydrogen into helium deep within their cores. But eventually stars will run out of hydrogen in the core, and then evolve into cool and bright giant stars with contracted cores but extended atmospheres. Such a star's core begins to fuse helium into carbon. For lower-mass stars, the helium fusion may turn off due to a lack of fuel, but the layer above still rains down additional helium. This additional helium can ignite fusion in a bright helium-shell flash.

Double black hole – On June 10, 2010, the XMM-Newton X-ray space telescope spotted an outburst from an otherwise quiet galaxy. The X-rays, initially quite bright, immediately started fading away exactly as expected for a supermassive black hole eating material. From the light curve, astronomers believed a star had passed too close to the black hole in this galaxy's core. But as the X-rays were dimming, they suddenly turned off, only to reappear 21 days later. A new explanation for this behavior has been proposed: 2 black holes orbiting each other and consuming a star. One of the black holes blocks the X-rays from the consumption sometimes. Because some other explanations have not been ruled out, more observations are planned to confirm the new theory. XMM-Newton's cameras are intentionally left on during slewing to the next object to be observed, in the hopes something interesting will be seen during the slew. This outburst was discovered during one of these live slews.

Faintest galaxy – Located 75,000 light years away, a galaxy known as Segue 1 is the faintest galaxy ever detected, is so small it contains only about 1000 stars, and has a rare chemical composition, with vanishingly small amounts of metallic elements present. A team of scientists has just analyzed that chemical composition. Typically stars form from gas clouds and then massive ones soon burn out as supernova explosions, spewing more of the elements that are the basis for a new generation of star formation. In contrast to all other know galaxies, it appears that Segue 1's process of star formation halted at what would normally be an early stare of a galaxy's development. Because it has stayed in the same early state, Segue 1 offers valuable information about the conditions of the Universe in its early phases after the Big Bang. The analyses used new data from ground-base telescopes pertaining to 6 red giant stars in Segue 1, the brightest ones in that galaxy. All of the elements in Segue 1 that are heavier than helium appear to have derived either from just 1 supernova, or perhaps a few, which occurred relatively soon after the galaxy's formation. Then Segue 1 effectively shut down, because it lost its gas due to the supernovas, and stopped making new stars. Also the neutron-capture elements, which are created in intermediate-mass stars, are in Segue 1 the lowest levels ever found. Scientists would like to find more similar galaxies, or to know how rare Segue 1 is.

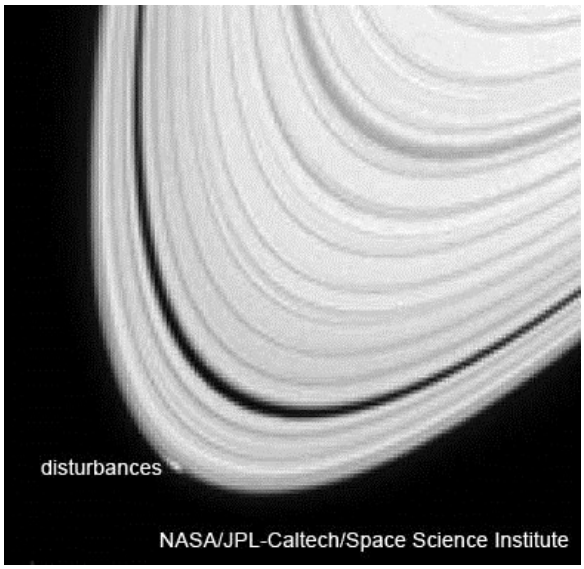


Polarization can reveal the existence and properties of magnetic fields that the light has traveled through. When unsymmetrical dust grains align with a magnetic field, they polarize the light that interacts with the grains. So scientists have made a map of polarization of the Universe visible to the Planck infrared space telescope. Swirls, loops and arches in the new map trace the structure of the magnetic field in our Milky Way galaxy. The Planck map shows a regular pattern on large angular scales, due to the magnetic field lines being predominantly parallel to the Milky Way plane. The data reveal variations of the polarization direction within nearby clouds of gas and dust, seen above and below the plane. Polarization could also provide evidence for gravitational waves generated in the Universe immediately after its birth. Recently scientists from the BICEP2 telescope claimed the 1st detection of such a signal. That claim relies on the assumption that foreground polarized emissions are almost negligible in this region. Later this year, Planck scientists will release data based on Planck's observations covering the entire sky at 7 different frequencies. The multiple –frequency data should allow astronomers to separate any possible foreground contamination from the tenuous polarized signal from primordial gravitational waves.

Mars rover Curiosity – After a test bore into a rock slab at "Kimberley", Mars rover Curiosity decided to go for a deep drill into a rock target called "Windjana" (named after a gorge in Australia) and successfully collected powdery samples from the rock interior to analyze in the 2 onboard chemistry labs. This marks the 3rd rock boring and analyzing by the rover. This new target is sandstone, as contrasted with mudstone on the rocks previously bored into. The operation went exactly as planned and left behind a pile of drill tailing much darker in color compared to the ubiquitous red color seen covering most of the Martian surface. Windjana is about 2.5 miles (4 km) southwest of Yellowknife Bay, where previous samples were drilled. Curiosity still has about another 2.5 mile to go to reach the base of Mount Sharp (its ultimate target) sometime later this year.

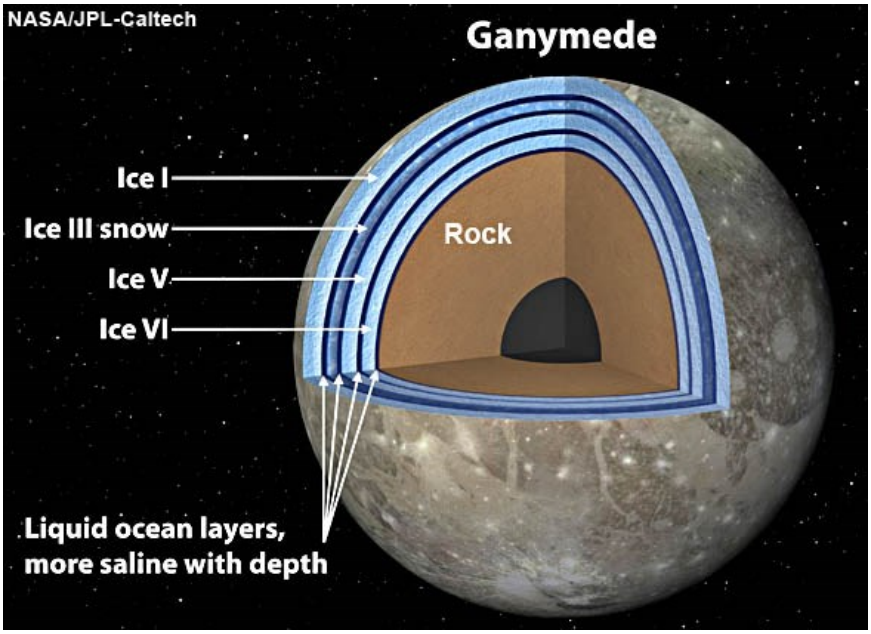
LADEE (lunar dust mission) crashed into the far side of the Moon, as planned, but a few days earlier than the original estimate. The lumpiness of the lunar gravity field meant that the crash time could not be precisely pinned

down until it was about to happen. NASA actually held a competition for the public to guess the exact time of LADEE's crash. Winner gets a certificate. LADEE imaged the zodiacal light, but probably not the rays of light seen by some astronauts who orbited the Moon. All images will be more carefully scrutinized for these rays. LADEE got all the planned data on the Moon's thin atmosphere and dust, and in fact got more data from lower altitude than the original plan, since the spacecraft used a little less fuel than expected in the early part of its mission. It is believed that dust is raised from the surface by static electricity. The Lunar Reconnaissance Orbiter will take images of the crash spot. LADEE may have made a visible crater, since it hit the Moon at 3600 mph (5800 km/hr).



Cassini (Saturn mission) has documented the formation of a small icy object near the edge of the rings that may be a new moon. Images show disturbances in the A-ring. One of the disturbances is an arc about 20% brighter than its surroundings, 750 miles (1200 km) long and 6 miles (10 km) wide. Scientists also found unusual protuberances in the usually smooth profile of the ring's edge. Scientists believe the arc and protuberances are caused by the gravitational effects of a nearby object too small to see. The object is not expected to grow any larger, and may even be falling apart. But the process of its formation and outward movement aids in our understanding of how Saturn's moon may have formed long ago.

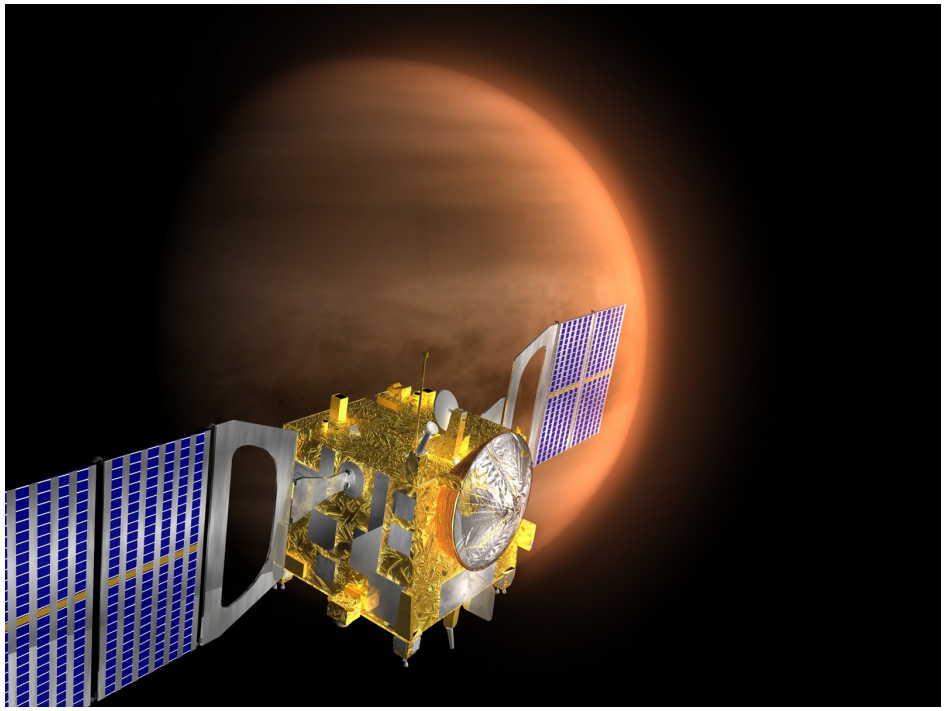
Space dust – A team of scientists has successfully reproduced in the lab the processes that occur in the atmosphere of a red giant star and lead to the formation of planet-forming dust. Such dust grains are ejected into the interstellar medium and eventually lead to the formation of planets around new stars. Scientists have found that the materials that make up the building blocks of the Universe are more complicated than originally anticipated. A new lab chamber reproduces the extreme conditions that reign in space with densities a billionth of Earth's atmosphere, temperatures less than minus 270°F (100°K), and bathed in ultraviolet and visible radiation. Expanding argon gas cools hydrocarbons down to these temperatures, and the dust forms that matches that thrown off by red giants.



Ganymede, which orbits Jupiter, is the largest moon in our solar system, and might have ice and oceans stacked up in several layers like a club sandwich, according to new research. Previously, the moon was thought to harbor a thick ocean sandwiched between just 2 layers of ice. Ganymede's sea bottom was thought to be coated with ice, not liquid down to the rocky core. The new study shows that a salty ocean should extend to the rocky core. The difference in the new study was that it took into account both saltiness

and pressure to determine the various states in which the liquid and solid water should be found. The new result is up to 3 layers of ice, each a different crystal structure. There is a place where salts precipitate out and fall through the liquid below like snow, and a place where snow forms and falls up. 5 or more moons in our solar system probably have oceans beneath icy crusts.

Evolution of the Universe – Researchers have created the most realistic computer simulation to date of the Universe's evolution, dubbed Illustris. It's the 1st to both predict large-scaled observations (the network of filaments spanning galaxy clusters) and small-scale observations (the detailed gas and stellar content within galaxies). Illustris began from initial conditions resembling the very young Universe 12 million years after the Big Bang. They then simulated complex physical laws, allowing it to evolve for 13 billion years. The results matched the current observable Universe remarkably well. Including supernovas and supermassive black holes was crucial to obtaining galaxies that resemble observations. It reproduced a wide range of observable properties, including the current ratio of the amount of stars to dark matter for galaxies of all masses. However it had difficulty producing realistic low-mass galaxies. These smaller galaxies formed far too early in the simulation, ending up with prematurely aged stellar populations. The fact that this simulation did the best so far in reproducing current reality indicates astronomers are close to understanding how the Universe evolved during most of the life of the Universe.



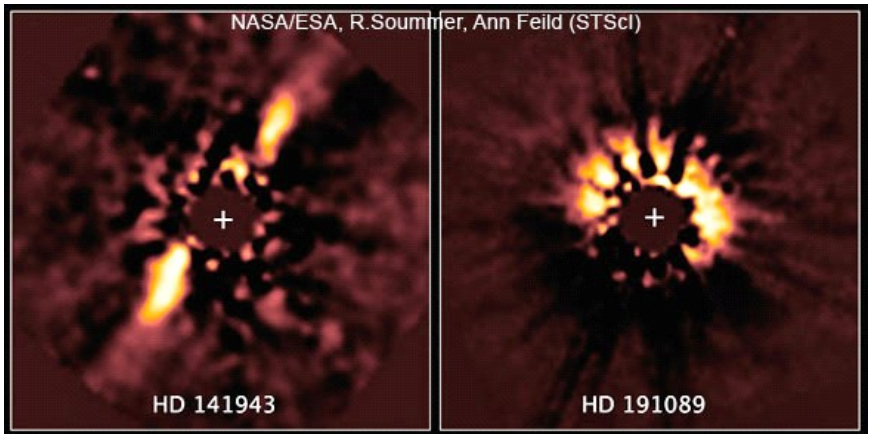
Venus Express (European Venus orbiter) is running low on fuel to maintain its science-gathering orbit after 8 years of doing so. The spacecraft team has decided to do an experiment in aerobraking with its little remaining fuel. Aerobraking is dipping barely into the top of the atmosphere in order to reduce its speed from the drag caused by the very thin air. Aerobraking can be used as a way of getting into orbit around planets without having to carry as much fuel. During the aerobraking experiment, partial science will be performed at this lower altitude, including measuring magnetic field, solar wind, atom analysis, temperature and pressure. If any fuel is left after the aerobraking experiment, the spacecraft will be raised slightly and science continued until fuel is absolutely gone, at which time the spacecraft will slowly drag down into the atmosphere and then burn up. With its suite of 7 instruments, Venus Express has during its primary mission provided a comprehensive study of the ionosphere, atmosphere and surface of the planet.

NASA budget – The WISE (wide field infrared space telescope) mission has been denied funding for data analysis to compare old and new images to detect things that vary (variable stars, supernovas, parallax motions, etc), though funding is approved for normal operation of the spacecraft and analysis to find asteroids. Funding was also denied to the Spitzer (infrared space telescope) mission for any operation after 2015. However the Spitzer team was encouraged by the budget committee to submit a proposal next year; this indicates Spitzer almost made the budget, and could possibly make it the following year. The NASA budget is not final, but it is worrisome at this

point to see so much good science being denied. A proposal that is funded at this point is the Kepler (planet finding space telescope) mission. After several months with Kepler out of operation, the spacecraft team has shown how orienting the spacecraft a certain way will allow it to maintain almost as good pointing accuracy as original even with 2 of the 4 reaction wheels broken. To maintain the balance of forces, the spacecraft will have to be moved several times a year, so cannot continue its planet-finding stare at one place in the sky, as it did for 4 years until the wheel failures. It can do shorter time stares for planet finding in other areas of the sky, as well as observing star clusters, young and old stars, active galaxies and supernovas.

Instant AstroSpace Updates

A new image processing technique that is more sensitive to faint objects has been applied to some archived Hubble Space Telescope images of young stars and found 5 previously overlooked **disks** about those stars. They are debris disks, those usually formed by collisions of asteroids after planets have formed.



Mars rover **Curiosity** took the 1st images of asteroids from Mars, catching Ceres and Vesta. Also captured were Jupiter, Saturn and both Martian moons.

A team of astronomers has discovered that the sudden speed jumps in the rotational velocity of pulsars, termed **glitches**, have a minimum size. It is much larger than theoretically expected.

Another asteroid with a suspiciously elongated 500-year orbit has developed a **comet** coma. So asteroid 2013 UQ4 has become comet C/2013 UQ4.

Images from the WISE infrared space telescope have found what appears to be a brown dwarf, only 7.2 light-years away (4th closest star system), whose temperature was measured in the range minus 54-9°F (minus 48-13°C), the **coldest known brown dwarf**. But it might be a planet unattached to any star, rather than a brown dwarf.

Anza Site Reminders

by Bob Buchheim

Our Anza observing site is a very special asset of the Orange County Astronomers, one of the things that make us the best astronomy club in the country. Since this is your club, it's your site; and it seems appropriate to remind all OCA members that we need to care for our site just as we care for anything else that is "ours" – with a concern for safety, hospitality, security, and sanitation. This is especially true in the spring and summer months, when Anza sees its heaviest activity.

First, safety. The site is in a very rural area, and therefore has all of the hazards that you'll find in such areas: cactus with sharp thorns, rocks and ditches to trip on, critters of various kinds, and the infamous red ants. Do be careful! Walk only on the roads and paths; use your red flashlight after dark; walk slowly – don't run; and don't mess with or tempt the critters. There are first-aid kits in the Observatory warming room and Anza House, but prevention is a better strategy than first-aid. Pay particular attention to your children. They are likely to be pretty excited about spending a night out-of-doors, which is good; but they're also likely to not have very good sense about what is appropriate, what is interesting, and what is risky. They rely on you for such wisdom. The fire hazard is very real in this area, so please honor the "no smoking" rule at the site (smoking is permitted only in your closed vehicle – you keep the ashes and the butts).

Second, hospitality: The Anza site is always open for use by our members, and their escorted guests. The site can get pretty busy during the summer, especially on star-party nights. Be friendly with the other members on the site, and be courteous of our neighbors (especially a regards noise and after-dark activities). If you are hosting a group of more than 6 guests, please read and follow the "Guidelines for Groups at Anza" (available on the OCA website).

Third, security. Because the Anza site is always open, please do not publish or publically distribute the location or directions to the site. Regular users of the site know the combination to the Anza House lock, and to the power panel at the Observatory (where the lock for the Observatory bathroom is kept). If you don't know the combinations, ask any regular member. Everyone has a special responsibility to see to it that the site is properly secured. If you're the last person on the site, please be sure to check that the observatory bathroom, warming room, power panel, and Anza House are all locked. If you're not the last person on the site, but you don't know the people who remain, please confirm with them that they'll take responsibility for locking everything up. We've had occasional instances when Anza House has been left unlocked – certainly not the way we'd treat our own houses. But, as I mentioned, if you're an OCA member, then Anza House <u>is</u> your house.

Finally, sanitation. There is no trash service at Anza, so be sure to pack out your trash when you leave. If you're one of the last to depart, please also take with you any trash from Anza House.

Enjoy your Anza site, and keep it attractive for all of our present and future members!

SIRIUS ASTRONOMER
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The Newsletter of the Orange County Astronomers

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President	Greg Schedcik	gregsched@verizon.net	714-322-5202
Vice-President	Reza AmirArjomand	reza@ocastronomers.org	646-494-9570
Treasurer	Charlie Oostdyk	charlie@cccd.edu	714-751-5381
Secretary	Bob Buchheim	Bob@RKBuchheim.org	949-459-7622
Trustee	Kyle Coker	kcoker@cox.net	949-643-9116
Trustee	Sheila Cassidy	rivme@pacbell.net	951-360-1199
Trustee	Sam Saeed	sam@isismagna.com	714-310-5001
Trustee	Gary Schones	gary378@pacbell.net	951-687-7905
Trustee	Steve Short	nightskytours@hotmail.com	714-771-2624
Trustee	Alan Smallbone	asmallbone@earthlink.net	818-237-6293
Trustee	Barbara Toy	btoy@cox.net	714-606-1825
COMMITTEES, SUBGROUPS, AND OTHER CLUB VOLUNTEERS			
Anza House Coordinator	Doug Acrea	dougcarola@att.net	949-770-2373
Anza Site Maintenance	Don Lynn	donald.lynn@alumni.usc.edu	714-775-7238
Beginner's Astronomy Class	David Pearson	p.davidw@yahoo.com	949-492-5342
Black Star Canyon Star Parties	Steve Short	nightskytours@hotmail.com	714-771-2624
Explore the Stars OCA Contact	Bob Nanz	bob@nanzscience.com	760-751-3992
Librarian	Karen Schnabel	karen@schnabel.net	949-887-9517
Membership, Pad Coordinator	Charlie Oostdyk	charlie@cccd.edu	714-751-5381
Observatory Custodian/ Trainer/Member Liaison	Barbara Toy	btoy@cox.net	714-606-1825
OCA Outreach Coordinator	Jim Benet	jimbenet@pacbell.net	714-693-1639
Sirius Astronomer Editor	Steve Condrey	startraveler68@yahoo.com	714-699-1243
Telescope Loaner Program	Don Stoutenger	dstouten@yahoo.com	714-271-2646
WAA Representative	Tim Hogle	TimHogle@aol.com	626-357-7770
Webmaster	Reza AmirArjomand	reza@ocastronomers.org	646-494-9570
SPECIAL INTEREST GROUPS (SIG's)			
AstroImagers SIG	Alan Smallbone	asmallbone@earthlink.net	818-237-6293
Astrophysics SIG	Bob Sharshan	RSharshan@aol.com	714-845-6573
Dark Sky SIG	Barbara Toy	btoy@cox.net	714-606-1825
Remote Telescopes	Del Christiansen	DelmarChris@earthlink.net	714-895-2215
GoTo SIG	Mike Bertin	MCB1@aol.com	949-786-9450

OCA WEBSITE: http://www.ocastronomers.org STARLINE 24-HR. Recording: 714-751-6867 ANZA OBSERVATORY: 951-763-5152