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

April 2012 *Free to members, subscriptions $12 for 12* **Volume 39, Number 4**

Although the conjunction between Venus and Jupiter has drawn much attention lately, Mars was recently at opposition with Earth. OCA member Trey McGriff captured this image of Mars with ice clouds on March 13th. Trey used a Meade 14-inch LX200 to create this image.

OCA CLUB MEETING

The free and open club meeting will be held April 13th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. This month, frequent OCA speaker Dr. Gary Peterson discusses Comets: Implications for the Earth.

NEXT MEETINGS: May 11, June 8

STAR PARTIES

The Black Star Canyon site will be open on April 14th. The Anza site will be open on April 21st. 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, April 6th at the Heritage Museum of Orange County at 3101 West Harvard Street in Santa Ana. The next two sessions will be on Ap-May 4th and .

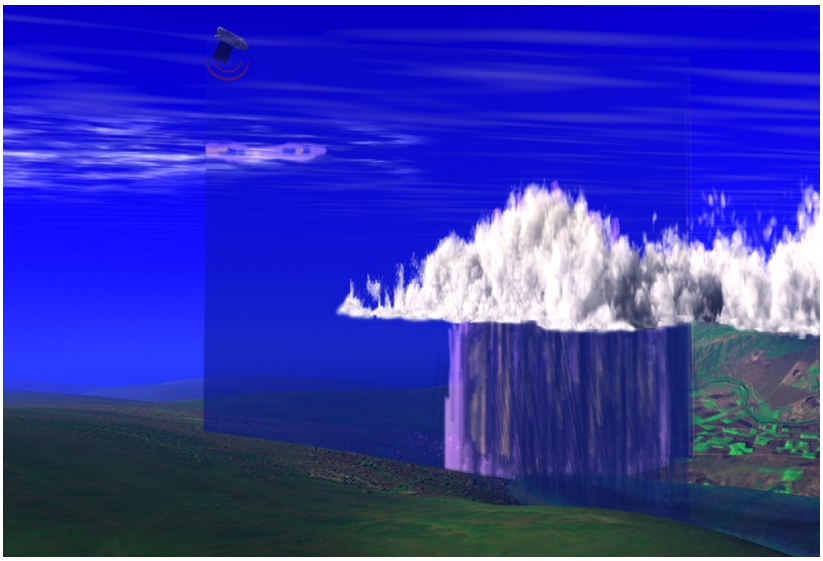
GOTO SIG: TBA
Astro-Imagers SIG: Apr. 23, May 15
Remote Telescopes: TBA
Astrophysics SIG: Apr. 20, May 18
Dark Sky Group: TBA

The Planet in the Machine

By Diane K. Fisher and Tony Phillips

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The "butterfly effect" is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes. Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real "butterfly effect" is driven by, for example, global winds and ocean currents, polar ice (melting *and* freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways. And then there's the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?



CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat's unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun's energy in the atmosphere. See animation of this data simulation at www.nasa.gov/mission_pages/calipso/multimedia/

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth's carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA's Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth's land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts. Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

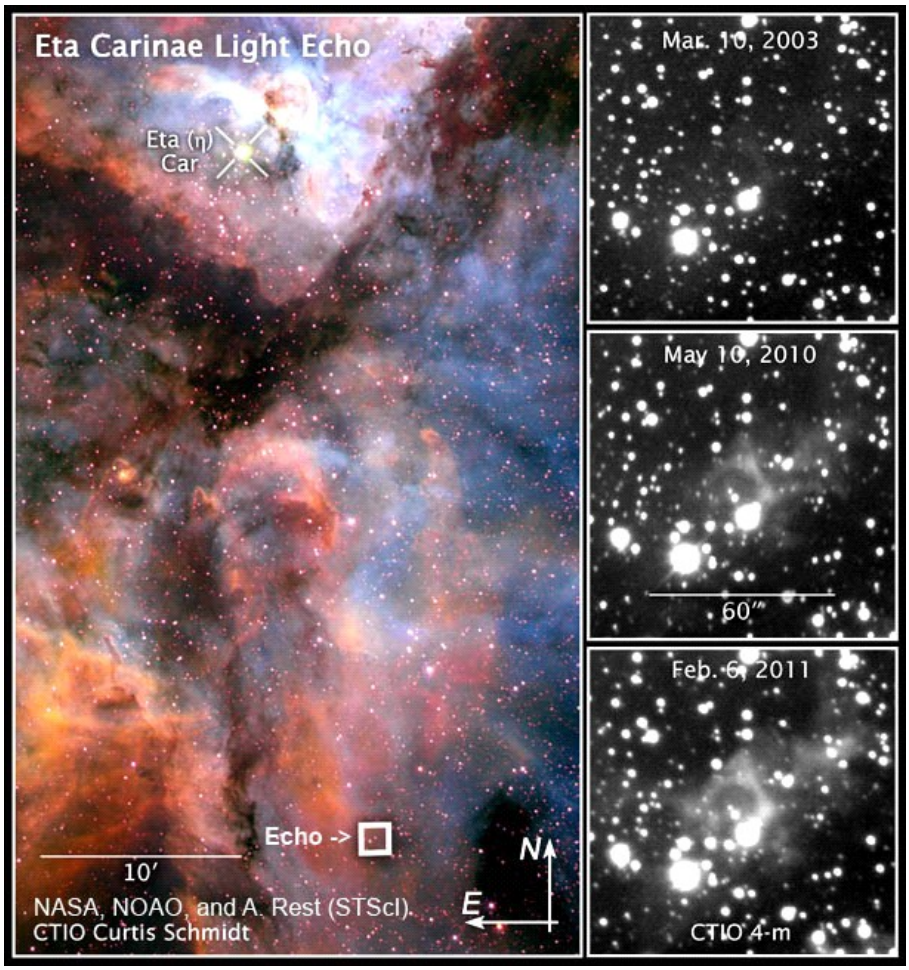
For a listing and more information on each of NASA's (and their partners') Earth data-gathering missions, visit http://science.nasa.gov/earth-science/missions/. Kids can get an easy introduction to Earth system science and play Earthy word games at http://spaceplace.nasa.gov/ecosphere .

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

April 2012

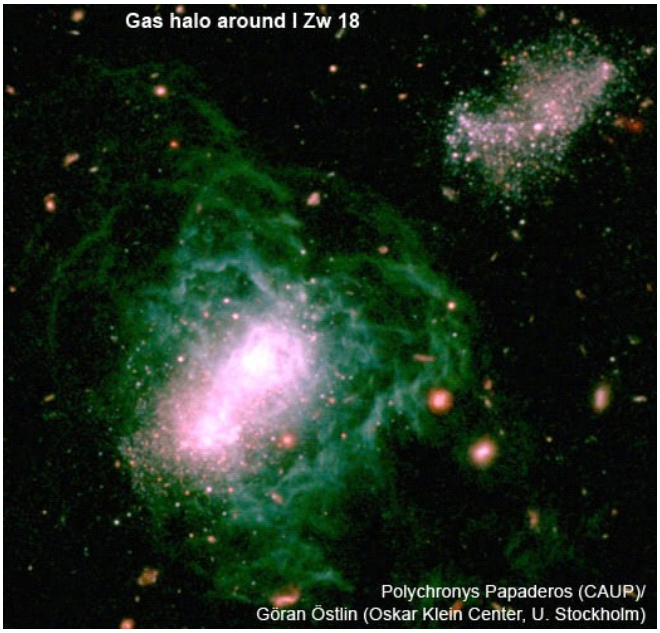
Gathered by Don Lynn from NASA and other sources



Hubble Space Telescope (HST) and various ground-based telescopes are watching a delayed broadcast of a spectacular outburst from the unstable double-star system Eta Carinae that occurred between 1837 and 1858. Visual observations were written up at the time, but sophisticated science instruments did not exist. But comparison of recent images showed a light echo moving through the clouds surrounding Eta Carinae. The light echo is just light from the outburst that reflected off clouds, where the light took a path that was about 170 light-years longer than a direct path to us, so we see the echo of the 1837 event now. To prove that it was indeed and echo of that event, the brightness of the echo over the last few years was compared to records of the old visual observations, and the brightness changes matched. Located about 7500 light-years from Earth, Eta Carinae is one of the largest and brightest star systems in our galaxy. During the 1837 event the star shed about 20 solar masses and became the 2nd brightest star in our sky. Some of the outflow formed the twin giant lobes seen today. Eta Carinae does not behave like other stars of its class, which is called Luminous Blue Variables. They are large, extremely bright stars that are prone to periodic outbursts. But the temperature of Eta's outflow is much cooler than that of other stars in its class. The blueshift in the spectrum of the light echo shows that the outflow in the 1837 event was moving at about 445,000 mph (700,000 kph), which matched theory. Observations are continuing, as it is expected that a secondary outburst from 1844 should soon appear.

HST has also come up with a new class of planet, a waterworld surrounded by a thick, steamy atmosphere. The planet is known as GJ1214b, and was discovered in 2009. Observations soon after showed that it has an atmosphere of water vapor. New HST observations in infrared showed that the whole atmosphere seems to be water vapor, not just a haze layer of water. Since it is a transiting planet (passes in front of its star), astronomers have measured its diameter, which is about 2.7 times that of our Earth. It orbits its red-dwarf star every 38 hours at a distance of only 1.3 million miles. This should make its temperature about 450° F (230° C). Its mass has been determined as about 7 times that of Earth, which yields a density of about twice that of water. Earth is 5.5 times as dense as water. That means GJ1214b has much more water and much less rock than Earth. A huge fraction of its mass must be water. The high temperature and pressure should form exotic materials like "hot ice" or "superfluid water". Theorists expect that GJ1214b formed farther out from its star, where water ice was plentiful, and migrated inward early in the system's history. In the process, it would have passed through the star's habitable zone. How long it lingered there is unknown. The planet is in Ophiuchus, and is about 40-light-years from Earth.

HST has also found evidence for a cluster of young blue stars encircling one of the 1st intermediate-mass black holes ever discovered. Small black holes (formed from a star collapsing) and supermassive black holes (found at the centers of most large galaxies) are both common. But intermediate-mass black holes are quite rare. This one was found in 2009 toward the edge of galaxy ESO 243-49 by the X-rays given off by material falling into it. Its estimated mass is 20,000 times that of our Sun. New observations by HST show an unresolved glow about the black hole that matches what should be emitted by a cluster of young blue stars combined with a gaseous disk. It takes both kinds of sources to explain the glow. More observations are needed to confirm these light sources, as other explanations are possible. Though young star clusters are common in the disk of a galaxy, they do not appear at the location where this one was found. This suggests that the intermediate-mass black hole came from some other galaxy, probably a dwarf galaxy that was captured by ESO 243-49. The future of the black hole is not known. Depending on its trajectory, which is unknown, it could spiral into the supermassive black hole at the center of ESO 243-49, or it could go into orbit around that galaxy. Either way, it is likely to fade away, as seen in X-rays, as it depletes its supply of gas. The rarity of intermediate black holes known suggests that they are easily seen in X-rays only for relatively short periods of time, probably only after capture events.

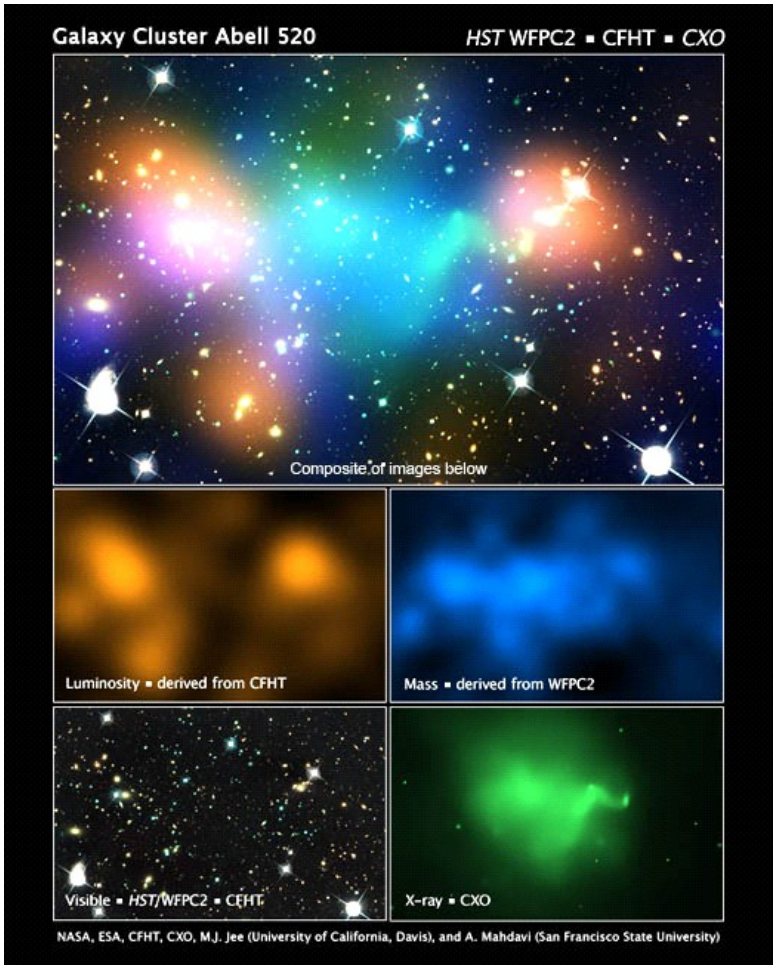


Galaxy halo – Astronomers used HST to get extremely accurate observations of the dwarf galaxy I Zw 18, and found it to be surrounded by an extended gas halo made up of nebular emissions, not emissions from stars. This may force astronomers to review current galaxy formation theories. The galaxy itself is undergoing a burst of star formation. The energy from these stars is heating the surrounding gas until it glows as bright as the stars in the galaxy. I Zw 18 is one of the most studied dwarf galaxies because it has strong star forming activity and it is one of the poorest galaxies in heavy elements. Those heavy elements are built up by successive generations of stars, so being poor in heavy elements means this galaxy has experienced unusually few generations of stars. Galaxy formation theory had predicted that the stars and the gas should occupy the same volume, but the new observations of I Zw 18 showed that the gas region is 16 times larger than the stellar region. This will require adjustments to principles such as the assumed correlation between galaxy mass and total brightness, and the means of classifying small unresolved galaxies as disk or elliptical.

Galaxy growth – New observations made with the Very Large Telescope in Chile are studying the growth of adolescent galaxies, those that existed in the period from about 3 to 5 billion years after the Big Bang. The study chose galaxies at such distances that the light from that period is now arriving at telescopes on Earth. Astronomers have known for some time that the earliest galaxies were much smaller than the spiral and elliptical galaxies seen today. So over the lifetime of galaxies they must feed on material to make new stars and grow into large galaxies. The new study found that at the start of those adolescent years, smooth gas flows into galaxies were the preferred method of feeding, but later galaxies mostly grew by cannibalizing other smaller galaxies. A big surprise found by the study was the discovery of many galaxies with no rotation of their gas. Such galaxies are not found in today's universe. No theories predicted the lack of rotation in earlier times. Another surprise was that many of the adolescent galaxies had heavier elements concentrated in their outer parts. This is the opposite of galaxies today: heavier elements are concentrated in the inner part. Further work will be done to confirm the feeding habits finding and to try to explain the surprises.

OCA CLASSIFIEDS

FOR SALE: JMI 12.5-inch split-ring Newtonian. 10 years old, but hardly used—like-new condition. Make an offer. Contact Jon Svet at svetj@att.net



Dark matter – When clusters of galaxies collide, the galaxies and the dark matter halos around the clusters pass through each other, with the galaxies remaining within the dark matter halo. But the gas between stars and between galaxies encounters friction and slows, getting left behind the dark matter and galaxies. This scene has been found true in about a half dozen colliding galaxy clusters that have been studied, starting with the famous Bullet Cluster. But a new study of another collision of galaxy clusters, known as Abell 520, shows that it did not follow the plan. The center of the huge clump of dark matter is practically devoid of galaxies, but does contain considerable gas. The galaxies are off to the sides. The dark matter of Abell 520 was mapped by its gravitational influence on light from background objects. The galaxies and their gas were observed in visible light and X-rays. HST was used to try to explain the strange behavior of the colliding clusters, but instead the HST observations just confirmed previous observations. The clusters are not behaving like any other studied colliding galaxy clusters. A number of explanations have been proposed for the configuration of Abell 520, but all seem to have flaws. A sample of explanations: 3 galaxy clusters are colliding, not 2; some dark matter behaves differently than other dark matter, in that it experiences friction; galaxies exist in the center of the dark matter, but are too dim to see. Astronomers are next going to try computer simulations of galaxy cluster collisions to see if there is any set of conditions that create the configuration seen.

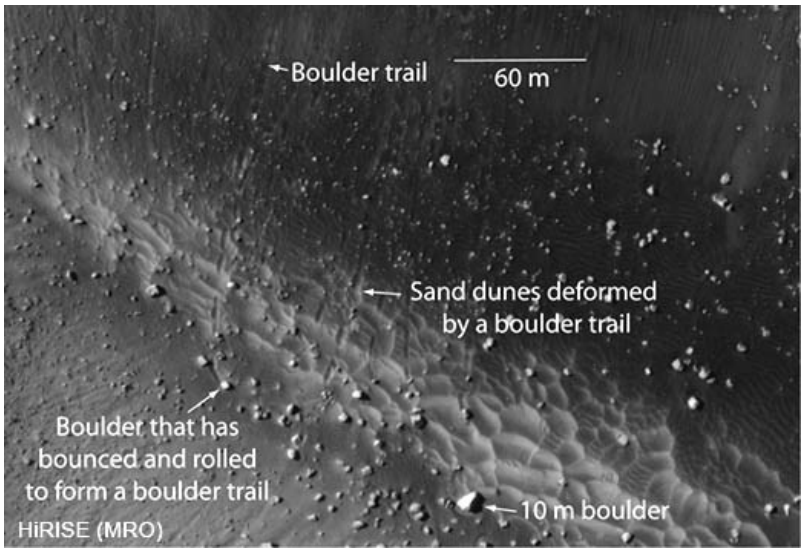
Black hole outflow – It has long been known that the mass of supermassive black holes at the centers of galaxies correlates with the mass of the central bulge of those galaxies. But the means by which this occurs has remained a mystery. A team of scientists has now discovered a type of outflow from supermassive black holes that appears powerful enough and common enough to explain the correlation. The new type of outflow may limit the star formation in the central bulge to an amount that depends on the size of the black hole. Previous studies have shown that jets and X-ray emission from a supermassive black hole are inadequate to affect the entire central bulge of a galaxy. The new type of outflow consists of clouds of cooler gas moving outward from the black hole. The clouds were detected by their absorption spectrum on X-ray light from their black hole. The speed of outflow (14% the speed of light) was determined by the blueshift of the spectral lines. The outflows were found in 40% of the galaxies studied, which suggests that they are common enough to possibly be the link between black hole and bulge masses. The amount of matter outflowing was found to be comparable to the amount that was falling toward the black hole, implying that most of the matter falling inward is being deflected back into an outflow. This means the new type of outflow could be limiting the size of the black hole, additionally to limiting the size of the bulge.

Chandra (X-ray space telescope) has detected the fastest wind yet discovered blowing off a disk around a stellar-mass black hole, known as IGR J17091-3624. The wind is moving about 20 million mph (32 million kph), about 3% the speed of light. This is nearly 10 times faster than had ever been seen from a stellar-mass black hole. The wind speed matches some of the fastest winds generated by supermassive black holes, objects million or billions of times more massive. Another surprising finding is that the wind, which comes from a disk of gas surrounding the black hole, may be carrying away more material than the black hole is capturing. The wind is blowing in many different directions, which distinguishes it from a jet, where material flows in highly focused beams perpendicular to the disk. Simultaneous radiotelescope observations showed the jet from the black hole that has been seen at other times was not

present when the ultrafast wind was seen. This provides further evidence that the production of black hole winds somehow stifles jets. A Chandra observation made 2 months before the ultrafast wind was seen showed no evidence of the wind, so the wind apparently turns on and off over time. Astronomers believe that magnetic fields in the disks of black holes are responsible for producing both the winds and jets. Changing conditions must determine whether winds or jets are produced.

Spitzer and Herschel (infrared space telescopes) have spotted young stars in the Orion nebula heating and cooling over time periods shorter than expected. Infrared penetrates the gas and dust surrounding these young stars, allowing them to be observed when visible light observations would not. Several of the young stars varied in brightness by more than 20% over just a few weeks. It was shown that the changes were caused by cool material, which should be located far from its star, and it was expected that movements of distant material should take years or more, not weeks. Two scenarios have been proposed to explain the fast changes: lumpy filaments extend from the outer regions, transporting cool gas to the center regions; hot material piles up in the inner regions and shadows other material that can remain cool. More study will be made to try to verify one of these theories.

Dawn (mission orbiting asteroid Vesta) has had its low altitude (and therefore high resolution) Vesta mapping orbit extended for 40 days. Those days were originally allocated for handling anomalies (problems with the spacecraft), but the Dawn team has handled all anomalies so far without a single day of lost observation. The low orbit was originally scheduled for 70 days, so this extension will allow substantially more high-resolution imaging, gravity measurements and spectroscopy. Dawn must depart Vesta in July in order to reach its next target, asteroid Ceres.



Mars Reconnaissance Orbiter (MRO) has taken images showing that the surface of Mars quakes, and has done so recently. This may imply that volcanic activity has also taken place recently, since volcanic activity can create quakes. The new images show boulders that toppled from a Martian cliff, some of them leaving trails in the soil. These were compared to dislodged rocks and their trails on Earth, and found to match images of rocks dislodged by earthquakes. The size and number of boulders decreased with distance from a point along the Cerberus Fossae faults. This indicates that the dislodged Martian boulders were caused by marsquakes from those faults. From the size of the affected area, the marsquakes must have had a magnitude greater than 7. Martian winds will over time cover markings in the soil, such as these boulder tracks, so the marsquakes must have been fairly recent. Some Mars rover tracks have been covered by wind-blown material in a few years.

MRO and Odyssey (also orbiting Mars) have had their orbits shifted slightly so that they will be overhead when the rover Curiosity lands in August. They will record engineering data from Curiosity during descent and landing at much higher data rates (because they are close) than are possible sending that data directly to Earth. Curiosity will be lowered to the surface by cables as its rocket hovers overhead, a new technique for landing, made necessary by the huge weight of the rover. Since the loss of the Mars Polar Lander during descent in 1999, without definitively determining the cause, NASA decided to monitor closely all planetary landings. The European spacecraft Mars Express will also monitor Curiosity's landing.

Cassini (Saturn mission) – Old images of Jupiter taken by Cassini in 2000 on its way to Saturn were assembled into movies to show cloud movement. A new study of these, along with amateur images from that time period, found Rossby waves for the 1st time in Jupiter's southern hemisphere. These waves are what make jet streams oscillate north and south instead of blowing directly toward the east. Earth has such Rossby waves, but they blow the jet streams here much farther off course than on Jupiter. Other types of waves were also found in the newly made Jupiter movies.

Cassini has detected molecular oxygen ions around Saturn's moon Dione for the 1st time, confirming the presence of an extremely thin atmosphere. It is as thin at the surface as Earth's atmosphere is up 300 miles (480 km). The moon Rhea and the rings of Saturn were previously known to produce a thin atmosphere of oxygen. Dione's oxygen appears to come from either solar photons or energetic particles bombarding the surface to knock oxygen loose from the water ice. But scientists continue to examine other possibilities. HST had previously detected ozone, another form of oxygen, near Dione.

Close asteroid encounter – Another asteroid, this one named 2011 AG5, has been discovered that has a small chance of colliding with Earth. It is believed likely that as its orbit is tracked longer, impact with Earth will be ruled out, as has occurred with other asteroids that were previously given chances of colliding. 2011 AG5 will approach Earth, but not really closely, in 2023. Depending on exactly how far this encounter occurs, it may be deflected toward an impact in 2040. The odds of this happening, given our imprecise current knowledge of its orbit, are 1 chance in 625. Unfortunately the asteroid is behind the Sun now, so good observations that should tell us that the impact (hopefully) won't happen cannot be made until September 2013. The asteroid has an estimated diameter of 460 ft (140 m). If it impacted, it would probably break up and make a whole field of craters, none larger than about 1300 ft (400 m). It would create an earthquake of magnitude 4.8. If it hit close to anything important, it would create a lot of damage. But keep in mind that the odds are decidedly against an impact.

Lunar Reconnaissance Orbiter has made new images that show a few places in the Moon's crust are being stretched, forming small valleys called graben. Previous images have shown widespread scarps that indicate the surface of the Moon is generally being compressed, so the opposite (stretching) was surprising. Both the compressed and stretched areas are sometimes geologically recent, indicating the compression and stretching may still be going on. The compression is believed caused by a general shrinkage of the interior as it cools.

Lunar impacts – Scientists analyzing new detailed maps of the lunar surface showed that craters formed near the Nectaris impact basin were created by projectiles hitting twice as fast as those found on more ancient lunar terrains. Craters at the Nectaris basin are thought to be a result of the Late Heavy Bombardment (LHB), a time of impacts about 4 billion years ago, that occurred somewhat later than the impacts that accreted the inner planets. The new analysis shows that the LHB consisted of objects moving about twice the speed of earlier impacts. This fits with the theory that migration of Jupiter or other giant planets about 4 billion years ago disrupted asteroids' orbits, causing many of them to impact the inner planets in what we call the LHB.

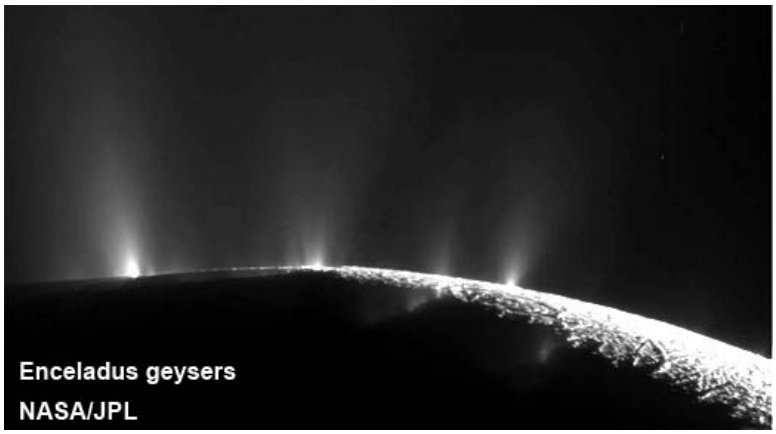
Sunspots – Since soon after George Ellery Hale discovered magnetic fields in sunspots in 1908, it has been known that intense magnetic fields suppress the normal flow of heat outward at the surface of the Sun, and this causes the area to become somewhat cooler and therefore darker. That is what makes a sunspot darker. But the details of this process remain hazy. More recent observations of temperature and magnetic field strength showed that below a certain temperature the field strength sharply increases. One theory to explain this is that at that temperature hydrogen atoms may start combining into hydrogen molecules. This would start a runaway process where the hydrogen molecules exert less pressure than atoms, and the lower pressure causes a lower temperature, and that causes stronger magnetic field, and that causes less heat flow, which causes more temperature drop and more molecules to form. Astronomers have not been able to test this theory because current technology is unable to detect hydrogen molecules in sunspots. But it is known that hydrogen molecules form at about the same temperature as hydroxyl radicals (OH). So new observations were made with infrared spectrographs on the Dunn solar telescope in Sunspot, New Mexico, to measure hydroxyl in sunspots, and also magnetic field strength. The results support the hydrogen molecule runaway theory. The runaway process apparently continues, resulting in the sunspot growing quickly, until heat from surrounding material finally contains the spot.

Magnetotail – A mysterious phenomenon detected by space probes has finally been explained by a massive computer simulation that was able to match details of spacecraft observations. The simulation showed that the area where magnetic reconnection events take place in the Earth's magnetotail is about 1000 times larger previously thought. This appears to be the only way that large numbers of high-speed electrons can be created, to match the numbers seen by spacecraft, such as the Cluster fleet of spacecraft. Magnetic reconnection is the process of magnetic field lines breaking and connecting to other field lines. This can result in release of energy and huge electric currents.

Van Allen radiation belts, where charged particles surround the Earth, have long been known to swell and shrink in response to quantities of solar wind. But it has remained a mystery where most of the particles go when shrinkage occurs. Some particles are known to move down to Earth and some to space, but the relative quantities are not known. A new study using multiple spacecraft (THEMIS, GOES and POES) simultaneously has tracked one such event and found much of the charged particles went up to space. Further study of this will be performed by the twin Radiation Belt Storm Probes, scheduled for launch in August.

Updates Updated

I reported here in November that an experiment had detected neutrinos traveling from Switzerland to Italy at 100.002% the speed of light, which would **violate Einstein's Special Relativity**. The researchers have examined every part of their apparatus and determined that 2 parts may not have been working correctly, both related to timing. The 2 problems should have affected the timing of the neutrinos in opposite directions, so it is not clear if the speed measured was too high or too low. They plan to repeat the speed measurements after fixing the 2 parts. Stay tuned.



Instant AstroSpace Updates

German astronomers have begun designing a proposed **mission to Saturn's moon Enceladus** that will burrow through the icy crust to find the liquid water below the surface that must be feeding the geysers seen there. The burrowing mechanism, called the IceMole, has already been tested on a Swiss glacier.

Astronomers have begun timing very precisely pulses from various pulsars scattered within our galaxy in an experiment to determine if **gravitational waves** can be directly detected by this method. Gravitational waves, which theoretically are emitted by black hole pairs, cosmic strings and other violent events, have been indirectly detected, but never directly.

An ultraluminous X-ray source (ULX) discovered in 2009 by Chandra (X-ray space telescope) in the neighboring Andromeda galaxy has now been shown to be a **stellar-mass black hole** which is swallowing material at very high rates, having an estimated mass of 13 times that of the Sun. It was the 1st ULX found in Andromeda, and is the closest one known.

ANNUAL VOICE OF THE CUSTOMER SURVEY

Once again, we are looking for input from you, the readers, to determine the direction which the newsletter should take during the coming year. Please send your suggestions for content, format, etc. to stevecondrey@ieee.org. Include [VOC-SA] in the subject line to ensure that your comments are captured in a timely fashion. If there's anything you'd like to see in the newsletter (or would no longer like to see) let me know. Especially with the changeover to Microsoft Publisher, now is the time to make changes and explore new directions!

Western Amateur Astronomers Board Meeting Notes

by Tim Hogle, WAA Vice President and OCA Representative

The Western Amateur Astronomers (WAA) held its winter board meeting on February 25 this year. With the passing of our dear friend and dedicated OCA member John Sanford, who has also been WAA's long term host for these meetings, his Starhome observatory in Springville was not available. So the meeting was held at the Chabot Space and Science Center in Oakland (a most impressive venue for its astronomy educational value), followed by stargazing with their observatory's historical 20" and 8" refractor telescopes. Clubs represented include OCA and Los Angeles Astronomical Society from Southern California, China Lake AS from the east central region, and Eastbay AS, Mount Diablo AS, Chabot Telescope Makers Workshop, and Mount Diablo Observatory Association from the Bay Area.

For those of you who have recently joined the OCA and may not be familiar with WAA, it is an umbrella organization of astronomy clubs, primarily in the western US, of which OCA has been a long time member and supporter. As an umbrella organization, 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.

One of WAA's most well-known functions is to select and present the G. Bruce Blair award and medal, a very prestigious honor for someone who has made truly outstanding contributions to amateur astronomy over a significant period of time. The Blair Award has a history going back to 1954; the list of recipients (many of whom are very well known) is posted on the WAA web site at http://www.waa.av.org. I am pleased to announce that this year the award is to be given to our own **Jim Benet** for his truly momentous accomplishments in organizing and leading outreach efforts for OCA in Southern California.

As Jim himself reported at a recent OCA meeting, the numbers speak for themselves: 650 outreach events over nearly 15 years, 100,000 plus people having had the chance to look through OCA members' telescopes; no one can remember one time when OCA had to cancel due to lack of Jim's being able to get people to bring their telescopes to scheduled events. Jim joins several other OCA members who have received this prestigious award over the years, including Bob Buchheim, Chris Butler, Msgr Ron Royer, and John Sanford. The award is to be presented to Jim at RTMC in May.

Other items of business from the WAA meeting include reports from member clubs in attendance, discussion about possible expansion of WAA's service to members, consideration of possible offers of assistance to John Sanford's estate to bring Starhome to a state of being available to amateur astronomers (per John's wishes). Among the WAA enhancements being considered are last year's Blair medal recipient Scott Roberts' offer to help restart the WAA's former newsletter, the Pacific Stargazer, improve communications between representatives of the member clubs by electronic means to provide notification of events of mutual interest and improve responsiveness to the needs of individual clubs, and to become more actively engaged in outreach.

The list of specific activities being considered will require significant effort, and we on the WAA board recognize the need for help. We can't do it all by ourselves. Assistance will ultimately need to come from individuals in WAA member clubs. So if any of you are interested in getting involved in these activities and have experience in newsletter publication, electronic communications enhancement, web page development or other communications arts fields, we would welcome your assistance. Please contact me if you might have an interest, or even ideas without commitment are welcome. My contact information is always on the back of the Sirius Astronomer.

WAA will again have an information booth at RTMC this year, probably near the snack bar. Stop by and say hello. For more info about WAA, log on to the Web site shown above.

John Sanford Memorial Star Party

by Tim Hogle

On February 18, a star party in memory of our late past-president and very active Life Member, John Sanford was held at his Starhome Observatory in Springville, CA (nestled in the Sierra Foothills near Porterville). The event was graciously hosted by John's daughter and son-in-law, Sharon and Brad Thorson. Although the weather did not cooperate long enough for telescope viewing, the approximately 25 or 30 folks in attendance did have a good time reminiscing about John's life and getting acquainted and reacquainted with each other.

In addition to Sharon and Brad and John's very perky 5-year old granddaughter Sierra, those in attendance included his son Mark, several current and past members of OCA, and John's friends from other times and places. Current OCA members included (from my recollection) John and Barbara Gossett, Msgr Ron Royer (a neighbor of John's for the past several years with his own observatory) with his mom, Violet (the oldest attendee at 101 years), Byron Groves, and I. Some very early OCA members were there as well, including Patrick Patterson, Harris Fogel, and Edie (formerly O'Neil) and Mike Zorn.

Others who I met there or had known previously included Katy Kuhn (Bill Kuhn's lovely daughter and strong OCA supporter), Billie Chandler (another astro-neighbor from Springville and current owner of the David Chandler Company), Earl Wilson (WAA Treasurer and helper for John over the last few years), Greg Thomas (another person who has provided much help to John maintaining the observatory since John has been unable to do that in the recent past) Lynn Fischer (a friend and former companion to John on astro trips) and the woman whose name I don't recall who is currently renting John's house and providing access to the observatory. Some came from North, some from South, others East and West (I believe all reside in CA). This is only a partial list; there were others I did not have a chance to meet or my memory of whom has slipped since then; sorry to not include you if you happen to read this.

The festivities went on until well after midnight, with various people peeling off as the need to go home or to accommodations dictated. John's two observatory telescopes were kept ready, and one Dobsonian brought by a guest was outside at the waiting. But the skies were mostly cloudy, with the frequent sucker holes showing beautiful, dark backgrounds of stars, but disappearing too quickly to point a telescope.

Four of us remaining camped at the observatory. In the morning, we said our goodbyes to each other and to Starhome and John (whose ashes I understand had been scattered on the property) and went on our ways. While the occasion was a lively and happy celebration of John's life, it was somehow strange to be there without him. And yet, with his memory so much alive, there was indeed a sense of his presence.

Spitzer (infrared space telescope) has detected buckyballs in a solid form in space, found around a binary star called XX Ophiuchi, 6500 light-years from Earth. Prior to this, those microscopic spheres of 60 carbon atoms had been found in space only in gas form.

Venus, Jupiter, and Mercury are seen in conjunction over Orange County in this image created by Don and Michelle Sabeurs on March 13, 2012. This image was created with a Canon 5D with a 28 mm lens at f/2.8, ISO 400 film, and a shutter speed of 1/6 second.

The rare 'green flash' or transient reflection is seen in this photo taken of sunset at Newport Beach on March 21, 2012. Michael Daugherty used a Nikon D300 with a 250mm lens at f/5.6, 1/2500 second exposure.

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CLUB OFFICERS (to contact the entire board at once, send an email to board@ocastronomers.net)

President	Reza AmirArjomand	reza@ocastronomers.net	646-494-9570
Vice-President	Greg Schedcik	gregs@ocastronomers.net	714-322-5202
Treasurer	Charlie Oostdyk	charlie@cccd.edu	714-751-5381
Secretary	Bob Buchheim	rbuchheim@earthlink.net	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	astrodwp@dslextreme.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	stevecondrey@ieee.org	951-678-0189
Telescope Loaner Program	Mike Myers	loanerscopes@twow.com	714-240-8458
WAA Representative	Tim Hogle	TimHogle@aol.com	626-357-7770
Webmaster	Reza AmirArjomand	reza@ocastronomers.net	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