SIRIUS ASTRONOMER

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The Newsletter of the Orange County Astronomers

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IN MEMORIAM: JOHN SANFORD 1939-2011

OCA mourns the passing of amateur astronomy pioneer and three-time past president John Sanford, who passed away after a long illness on December 11. In addition to being one of the founding members of the club, John helped spearhead the development of our Anza site and ran a nationally-recognized photography program at Orange Coast College for many years. He will be missed, and the club extends its condolences--and heartfelt thanks for his services--to his family.

OCA CLUB MEETING

The free and open club meeting will be held January 13th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. This month our speaker is Dr Christian Ott of Caltech, who will discuss 'Stellar Collapse, Core Collapse Supernovae, and the Formation of Stellar-Mass Black Holes.'

NEXT MEETINGS:

Feb. 10th

STAR PARTIES

The Black Star Canyon site will be open on January 28th. The Anza site will be open on January 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

There will be no Beginners Class for the month of January. Please check the website for information regarding February's class.

GOTO SIG: Feb. 6th
Astro-Imagers SIG: TBA
Remote Telescopes: TBA
Astrophysics SIG: TBA
Dark Sky Group: TBA

John Robert Sanford -- In Memoriam

by Sheila Cassidy

Southern California has lost a great influence on amateur astronomy. From Springville, where he retired, to his earlier years in Orange County, he made himself available to astronomers and onlookers alike in events such as star parties, conferences, club meetings and outreach events.

John was bit by the astronomy bug early in his life, in Orange County, New York. At the tender age of 8 years old he saw his first solar eclipse. That was all it took. He was off and running. His father was a machinist and helped him assemble a two-inch refractor lens kit into a telescope. According to John, this was a kit from Edmunds. John remembered seeing Jupiter, with its four moons through the hand-held telescope. A 3.5-inch Skyscope refractor telescope followed, on his 12th birthday. His parents would drop him off at Chestnut Street School so he could observe, and then pick him up around 11pm. He continued to acquire telescopes and soon had a better 3 inch refractor and a six inch Newtonian. In his freshman year in high school, he and a few friends founded the Newburgh Astronomy club. The club papers were still in existence 21 years later, when John visited Newburgh. John's photography proceeded apace, and he won awards at the New York state science congress at Cornell, and in the National Scholastic-Ansco photo contest. He became hooked for good on photography after being allowed to hang around an Italian commercial photographer's darkroom and saw a print coming up in the developer. He also developed a secondary interest in archeology and exotic locales as a result of reading the Geographics and the Book of Knowledge Encyclopedia set that his parents bought. This was before the age of television.

The call of astronomy was still there when John took the College Boards. He was awarded a regents scholarship and settled on Cornell. But he ran into a barrier when he had trouble with physics because of a lack of mathematical background (calculus). The realization that he would never be a professional astronomer took some time to adjust to. About a year and a half later he transferred to the Rochester Institute of Technology and majored in photography after winning one of two national scholarships given by the Photography Society of America. But that only lasted for a semester, as Rochester pulled the photography classes. So back to Cornell went John, this time with a Sociology/Anthropology major. He joined the photo staff of the Cornellian, the yearbook as a junior. By his senior year, he was the photo editor of the 1961 Cornellian.

John beat the draft by enlisting in the Army for the photojournalism school after color blindness kept him out of OCS in the Air Force and Navy. His reward for being second in the class was to be put on a photo team for Vietnam. The lower half of the class of 20 got sent to NATO in Paris. This was in April of 1962, when the US advisors were about 5,000 Green Berets. He made his way around Vietnam mostly in Otter or Caribou Army aircraft flying mail or supply runs. He returned to Vietnam in 1965 for 6 months as a tech representative for Pax Electronics, a company that made transportable photo labs like the ones he had worked at in the Army. This was the time of the big buildup during the Vietnam War. During this time he was also able to take advantage of his location to finally see the ancient ruins at Angkor Wat and Angkor Thom that he had read about as a child.

He bought a car through the PX in Vietnam, a Volvo Station Wagon that was imported directly from the factory in Sweden to a port in New Jersey. His wife, Ellen and his father picked it up. It was the car that they later made the trip across country when they moved to Mountain View, California. After a few months he found an Industrial photography job with Lockheed Aerospace. A year later he quit to enter a masters program at San Francisco State College in Creative Arts Interdisciplinary Studies, with a concentration in photography. He added a junior college teaching credential and was ready to go. It was at a job fair in Oakland that he learned about an opening for a photo instructor at a community college in Costa Mesa. After looking the place over, he accepted a photo instructor's position at Orange Coast College and never left. It was from Orange Coast College that he retired after 29 ½ years of helping to build the photography department into a national known and acclaimed student destination.

It was around February of 1971 that John heard about the Orange County Amateur Astronomers Association, the predecessor to the OCA. At the time, the club had 35 members and was meeting at the Santa Ana Library and the Lincoln Savings community rooms. The club president was Bob Goff, an employee of Perkin-Elmer, who, in John's words, "knew everything about optics and a good deal about astronomy." Bob Goff was John's guru until Goff died in 2001. John was quick to form friendships with Bill Schafer, a builder of telescope mounts, Art LeBrun, and Brian Holcroft. It was at Brian's house in the 70's that John and Brian and the crew turned out the Sirius Astronomer on an old mimeograph machine.

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NASA's Space Place

Dawn Takes a Closer Look

By Dr. Marc Rayman

This full view of the giant asteroid Vesta was taken by NASA's Dawn spacecraft, as part of a rotation characterization sequence on July 24, 2011, at a distance of 5,200 kilometers (3,200 miles). Credit: NASA/ JPL-Caltech/UCLA/MPS/DLR/IDA

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter. The spacecraft accomplishes this feat using ion propulsion, a technology first proven in space on the highly successful Deep Space 1 mission, part of NASA's New Millennium program.

Launched in September 2007, Dawn arrived at protoplanet Vesta in July 2011. It will orbit and study Vesta until July 2012, when it will leave orbit for dwarf planet Ceres, also in the asteroid belt.

Dawn can maneuver to the orbit best suited for conducting each of its scientific observations. After months mapping this alien world from higher altitudes, Dawn spiraled closer to Vesta to attain a low altitude orbit, the better to study Vesta's composition and map its complicated gravity field.

Changing and refining Dawn's orbit of this massive, irregular, heterogeneous body is one of the most complicated parts of the mission. In addition, to meet all the scientific objectives, the orientation of this orbit needs to change. These differing orientations are a crucial element of the strategy for gathering the most scientifically valuable data on Vesta. It generally requires a great deal of maneuvering to change the plane of a spacecraft's orbit. The ion propulsion system allows the probe to fly from one orbit to another without the penalty of carrying a massive supply of propellant. Indeed, one of the reasons that traveling from Earth to Vesta (and later Ceres) requires ion propulsion is the challenge of tilting the orbit around the sun.

Although the ion propulsion system accomplishes the majority of the orbit change, Dawn's navigators are enlisting Vesta itself. Some of the ion thrusting was designed in part to put the spacecraft in certain locations from which Vesta would twist its orbit toward the target angle for the low-altitude orbit. As Dawn rotates and the world underneath it revolves, the spacecraft feels a changing pull. There is always a tug downward, but because of Vesta's heterogeneous interior structure, sometimes there is also a slight force to one side or another. With their knowledge of the gravity field, the mission team plotted a course that took advantage of these variations to get a free ride.

The flight plan is a complex affair of carefully timed thrusting and coasting. Very far from home, the spacecraft is making excellent progress in its expedition at a fascinating world that, until a few months ago, had never seen a probe from Earth. Keep up with Dawn's progress by following the Chief Engineer's (yours truly's) journal at http://dawn.jpl.nasa.gov/mission/journal.asp. And check out the illustrated story in verse of "Professor Starr's Dream Trip: Or, how a little technology goes a long way," at http://spaceplace.nasa.gov/story-prof-starr.

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

AstroSpace Update

January 2012
Gathered by Don Lynn from NASA and other sources

Cygnus X-1 has long been known as a binary star system that consists of a black hole and an ordinary star companion, with material from the companion falling into the black hole. New observations using both orbiting and ground-based telescopes have found for the 1st time an accurate distance to Cygnus X-1 (6070 light-years). Since other properties depend on the distance, this allowed the 1st accurate calculation of the black hole's mass (nearly 15 times the Sun's mass) and spin (over 800 rotations per second). It is one of the most massive stellar black holes in the Milky Way, and is spinning as fast as any black hole measured. This previous lack of accuracy is in spite of a great deal of observation since its discovery nearly 50 years ago. The only internal properties of a black hole observable outside are mass, spin and electrical charge. Black holes, like most objects, never have much charge, since charge attracts the opposite charge, which then neutralizes it. So accurate numbers for the mass and spin complete our knowledge of the black hole itself. The new distance was found by direct parallax measurement using the VLBA, a continent-wide radio telescope system. Additionally Cygnus X-1's motion through our galaxy was measured, and it was found to be too slow to have been formed by a supernova. Such an explosion gives a higher kick to the resulting black hole's motion.

Hubble Space Telescope (HST) has observed clouds of gas surrounding our Milky Way and more than 40 other nearby galaxies in order to find out how such gas feeds star formation within galaxies. The clouds are invisible except by their spectral lines impressed on light from beyond passing through them. HST's Cosmic Origins Spectrograph was used, observing light from distant quasars which had passed through the areas suspected of having gas clouds. The levels of heavier elements in the clouds showed that much of this gas had been blasted out of the galaxies, after stars produced those heavy elements. Eventually much of the cloud material falls back to feed star formation. Gas with the mass of 100 million Suns was found about the Milky Way, and it was found to be falling in at about 1 Sun's mass per year, in agreement with the rate of star formation in the galaxy. This process was calculated to continue for about another billion years, after which star formation in the Milky Way may drop to zero. Astronomers were surprised at how much of the gas about the other galaxies studied consisted of heavier elements (than hydrogen and helium). Some of the heavier elements were found as far as 450,000 light-years outside galaxies. This indicates that galaxies throw more material out from their stars than predicted theoretically. It also indicates that the returning outflows are a bigger source of star-forming material than newly gathered intergalactic gas.

Cassini (Saturn mission) has for the 1st time used its radar on the moon Enceladus. It has previously been used extensively on Titan. The area scanned is near, but not at, the deep cracks known as tiger stripes from which geysers spout. The radar images are the highest resolution images taken of this area. Some very bright (in radar) areas were seen, and the cause is not known. One possibility is that the surface there is covered with round ice rocks. The new images reveal undulations and other intricate patterns that had not been seen previously. Measurements were made of the heights and depths of the grooves in the area, with one measuring about 2100 feet (650 m) deep and 1.2 miles (2 km) wide. It has slopes of about 33°.

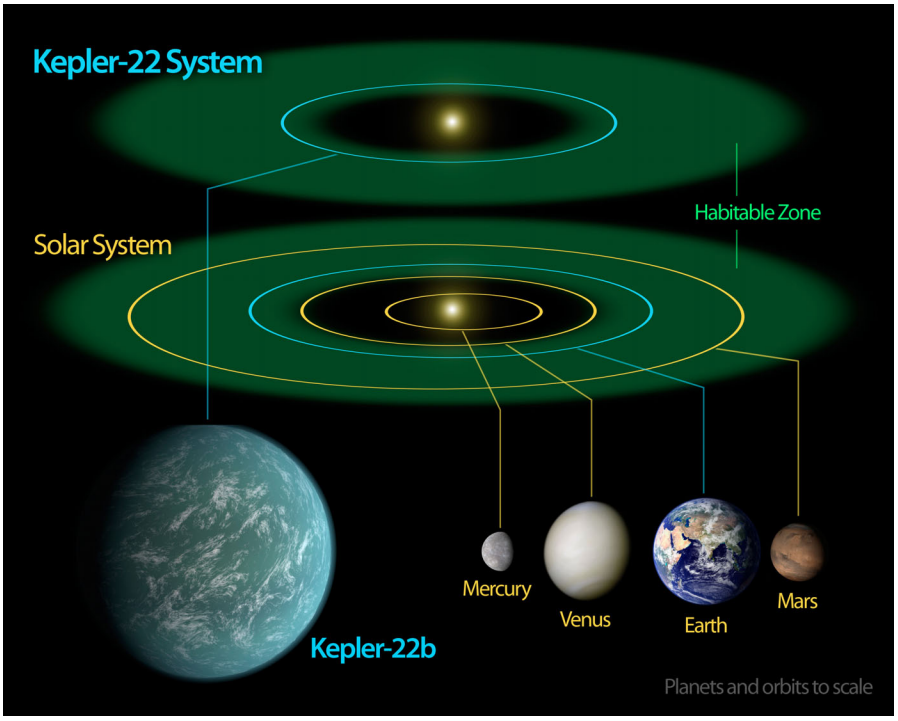
Galileo (Jupiter mission) – A new examination of old data from Galileo, comparing it to computer simulations of ice behavior and to 20 years of observations of Earth's ice sheets and floating ice shelves, shows that the chaos terrain found on the Jovian moon Europa is likely caused by liquid water from lakes below the icy surface. Chaos terrain consists of roughly circular bumpy features. The ice on the surface is disturbed by liquid beneath, forms into hills and jagged mounds, then is refrozen into place when the liquid seeping up cools, forming the chaos terrain. Similar processes have been seen on Earth, both in Antarctica and Greenland. Previous evidence showed that there is a salty liquid water ocean several miles below the surface, but this water may be from lakes closer to the surface. It will probably take a future mission to Europa to determine if this computer simulation is accurate. If it is, then liquid is closer to the surface and sunlight, and exchanges material with the surface, raising the likelihood of conditions under which primitive life could form.

Mars Reconnaissance Orbiter (MRO) has found sand dunes and ripples that have moved since previous images at dozens of locations on Mars, shifting up to several yards. The fine red dust particles are easily lifted by winds that have been observed on the planet by landers, but the darker sand grains that make up the dunes are much larger and have been calculated to require 80 mph (130 kph) winds to move them. Such strong winds have been found to be rare on Mars, but yet the dunes were caught moving. Not all sand on Mars is moving. The study also identified several areas where the forms did not move. It is not known if such areas have heavier sand or some

cementing action affecting the grains. They might just move on longer times than we have been imaging them. For example, Mars' known long-term climate changes may have affected the formation of the non-moving dunes thousands or millions of years ago.

Kepler (planet-finding space telescope) has another exoplanet to add to its growing list. A research team has shown that one of the brightest stars in the Kepler field of view has a planet with a radius only 1.6 times that of Earth and a mass no greater than 10 Earth masses, orbiting its star in only 2.8 Earth days. The team needed multiple telescopes on the ground to confirm their Kepler observations. Part of the difficulty in detecting this planet is that many stars show short period brightness oscillations. The effect of these must be removed from the stellar light in order to uncover the regular, but very small, dimming caused by the planet passing in front of the star. Kepler observed this for over 15 months, and also relied on spectroscopic and imaging data from a number of ground-based telescopes. The planet, designated Kepler-21b, is only about 3.7 million miles (6 million km) from it parent star, far closer than Mercury is to our Sun. So Kepler-21b is hot (about 2960° F, or 1900° K). The parent star, HD 179070, is similar to our Sun: its mass is 1.3 solar masses, its radius is 1.9 solar radii, and its age, based on stellar models, is 2.84 billion years, a bit younger than the Sun's 4.6 billion years. HD 179070 is spectral type F6 IV, a little hotter and brighter than the Sun. By astronomical standards, HD 179070 is fairly close, at 352 light-years.

More Kepler – Kepler-22b has been confirmed as a planet solidly in the habitable zone, the region where liquid water could exist on a planet's surface. The Kepler team also announced 1094 new planet candidates, nearly doubling the candidate list. Candidates require follow-up observations to verify they are actual planets, not variations in a star's light due to reason other than a planet passing in front. 10 of the new candidates are near Earth-sized and orbit in the habitable zone of their host star. Kepler-22b is the smallest yet found to orbit in the middle of the habitable zone of a star similar to our Sun. The planet is about 2.4 times the radius of Earth. Scientists don't yet know if Kepler-22b has a predominantly rocky, gaseous or liquid composition. Kepler-22b is located 600 light-years away. While the planet is larger than Earth, its orbit of 290 days around a Sun-like star resembles that of our world. The planet's host star belongs to the same class as our Sun, G-type, although it is slightly smaller and cooler. Of the 54 planet candidates in habitable zones that were reported last February, Kepler-22b is the 1st to be confirmed as a planet. The catalog of Kepler planet candidates now totals 2326. Of these 207 are approximately Earth-size, 680 are super Earth-size, 1181 are Neptune-size, 203 are Jupiter-size and 55 are larger than Jupiter.



Exoplanet atmosphere – Images taken through 3 different filters were used to try to learn about the atmosphere of an exoplanet known as WASP 14b, which transits (passes in front of) its star. The observations were compared to computer predictions of what should be seen for different types of atmosphere. This did not identify the constituents of the atmosphere, but did rule out some possibilities. In particular, a thermal inversion layer was ruled out. Such a layer is where the atmosphere sharply becomes warmer above a certain altitude. The few other hot Jupiter type exoplanets (a gas giant that orbits very close to its star and so is made quite hot), for which there are observations of the atmosphere, have consistently shown a thermal inversion layer. It was believed that titanium oxide and vanadium oxide should be present in hot Jupiter atmospheres, and these would create a thermal inversion layer. The new observation will cause theorists to rethink this. 14b was also found to be brighter than expected when it was near full phase (fully lighted like a full moon). This suggests that the planet is not redistributing its heat to the night side as fast as theory predicts. Another puzzle to solve. The new observations confirmed a previous one that showed a notably elliptical orbit. Theory has it that forces close to a star will circularize any elliptical orbits, unless another planet exists in the system close enough to perturb it toward elliptical. This suggests another planet exists nearby.

Voyager 1 (outer planet mission, now beyond the planets) has entered a new region between our solar system and interstellar space. Although it is about 11 billion miles (18 billion km) from the Sun, it is not yet in interstellar space. The direction of the magnetic field lines has not changed, indicating Voyager is still within the heliosphere, the bubble of charged particles the Sun blows around itself. The data do not reveal exactly when Voyager 1 will make it into interstellar space, but suggest it will be in a few months to a few years. Scientists reported in April 2010 that the outward speed of the solar wind had diminished to zero. Since then, the spacecraft was rolled around several times

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to determine if the wind was still blowing, but in some deflected direction. It was not. Voyager 1 is in a doldrums, where there is very little solar wind. During this past year, the magnetometer has detected a doubling of intensity of magnetic field, indicating that inward pressure from interstellar space is compacting the field. Until mid-2010, the intensity of energetic particles originating from inside our solar system had been holding steady, but now has been declining, indicating those particles are leaking out into interstellar space. During the same period, Voyager has detected a 100-fold increase in the intensity of high-energy electrons from elsewhere diffusing in from outside.

Voyager 2 (outer planet mission, now beyond the planets) has been sent commands to start using its backup roll thrusters to stabilize itself. Now both of the Voyagers are using all backup thrusters, having turned off the primary ones. The primary roll thrusters have had no problems in their 32 years of use, pulsing 318,000 times. But they have to be kept heated in order to work properly, and the spacecraft needs the 11 watts used by the heaters for other purposes. The radioactive electrical generators are slowly dropping in power, so this saving will prolong the life of the spacecraft for years.

Messenger (Mercury mission) is nearing the end of its planned 1 Earth year of orbiting Mercury, so NASA extended its mission for another year. During the extended mission, Messenger will spend more time close to the planet and will make more targeted observations. In other words we will take a closer look at interesting features found. These include: volatile materials on the surface, age dating volcanic activity, areas of enhanced exosphere (the extremely thin atmosphere), and energetic electrons emitted. The extension will also allow observing the planet's reaction to increased solar activity as the Sun proceeds through its sunspot cycle.

Possible Pluto ocean – New research shows that beneath the frozen surface of Pluto there is likely a liquid water ocean. The surface is known to be a thin shell of nitrogen ice over a thick shell of water ice. But if there is enough internal heat, probably due to radioactive material decaying, then there should be a layer warm enough to be liquid. When the New Horizons spacecraft flies by Pluto in 2015 it will look for an equatorial bulge and for surface tensional cracks. A liquid layer would tend to slump away the bulge that the dwarf planet should have formed with, and could crack the surface like the liquid layer in Jupiter's moon Europa has done.

Dawn (asteroid mission) maneuvered into its closest orbit around the giant asteroid Vesta, at an altitude of about 130 miles (210 km), a phase known as low altitude mapping orbit. It will stay there for at least 10 weeks, imaging portions of the surface at greater resolution than at higher altitudes. But the primary goal of the low orbit is to use the gamma ray and neutron detector to identify many kinds of atoms in the surface, and to measure the gravitational field of Vesta, telling scientists how mass is distributed inside. After the low orbit, Dawn will spiral out and conduct another science campaign at high altitude (420 miles, or 680 km). During this time, Vesta's north pole will be better lighted. Dawn is scheduled to leave Vesta in July and arrive at Ceres in February 2015.

Artist's rendition of Shenzhou spacecraft docking with the Tiango

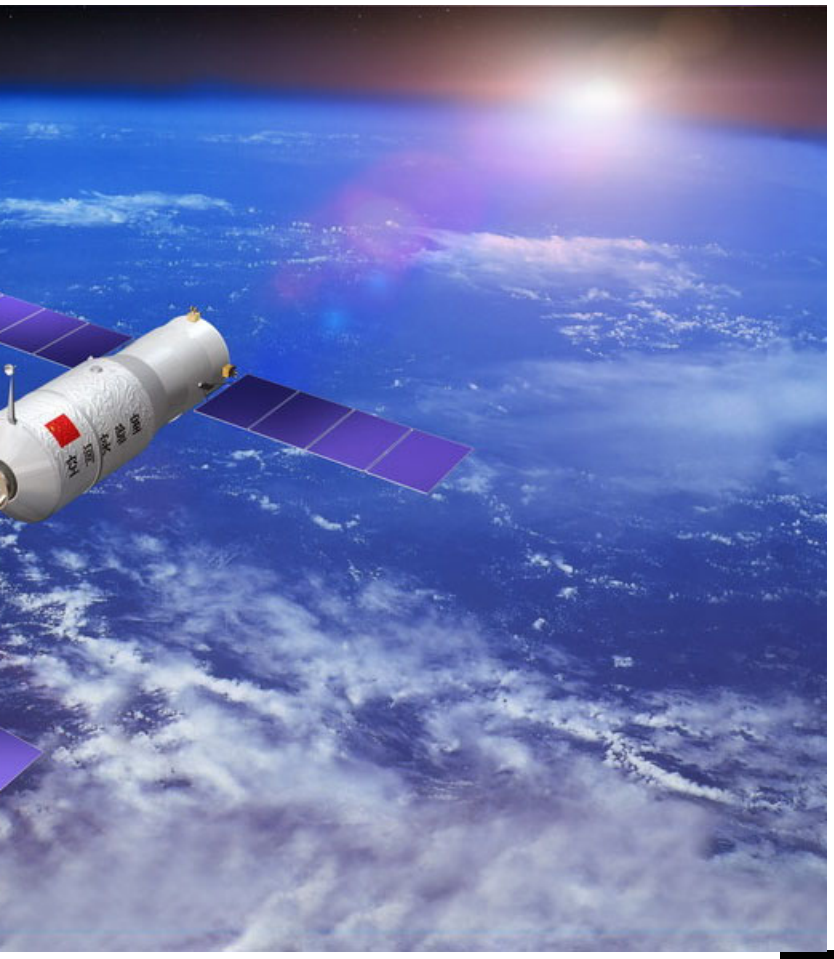
Curiosity (Mars rover) launched toward Mars in late November. The launch was so close to the desired trajectory that the 1st course correction was unnecessary. Curiosity will touch down near the foot of a mountain inside Gale Crater on August 6, and will investigate whether the region has ever offered conditions favorable for microbial life. It carries 10 science instruments with a total mass 15 times that of the instruments on the Mars rovers Spirit and Opportunity. The most spectacular instrument is a laser that can fry rocks at a distance, and then take the spectrum of the smoke to tell what the rocks are made of.

Fobos-Grunt (English: Phobos-Ground/Soil, Russian sample return mission to Martian moon Phobos) is still stuck in low Earth orbit, since its upper stage rocket failed to ignite and push it toward Mars. An Australian dish antenna successfully communicated with it twice, receiving a limited amount of telemetry, which it is hoped will reveal the nature of its problem. But subsequent attempts failed to communicate. At such a low orbit, the best opportunities to communicate are limited to 6-8 minutes before it goes out of range. An antenna in the Canary Islands has been modified to talk to Fobos-Grunt. Passes there should have slightly more time to communicate. If nothing else changes, it is expected that the Earth's atmosphere will drag down the spacecraft in late January or February.

Akari (Japanese infrared space telescope) was switched off, ending its mission, following unsuccessful attempts to overcome a main battery failure that began last May. It had completed in 2007 its original 18-month mission of scanning the entire sky, and gone on to extended mission phases of further observations.

SETI (Search for ExtraTerrestrial Intelligence) – The Allen [radio] Telescope Array (ATA) is again searching planetary systems for signals that would be evidence of extraterrestrial intelligence. Among its 1st targets are some of the exoplanet candidates recently discovered by Kepler. The ATA was placed in hibernation last April as the result of the withdrawal of funding from the University of California at Berkeley, due to budget problems. New funding has been acquired thanks to the generosity of the public who donate on a SETI website and thanks to a U.S. Air Force contract to perform non-SETI research.

Updates Updated



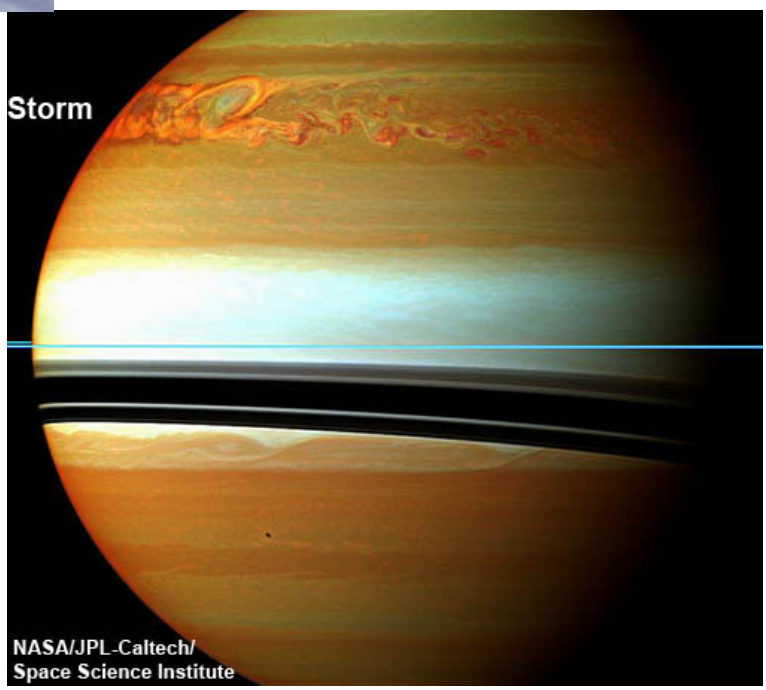
ong-1 space station (China Manned Space Engineering Office)

China – The Shenzhou unmanned spacecraft, reported here in December to have docked with the 1st Chinese space station, Tiangong-1, has since backed away, and then repeated the approach and docking in daylight (the 1st time was in darkness). Then Shenzhou was commanded to reenter the atmosphere, and landed safely in Inner Mongolia. There were actually test dummies and astronaut supplies aboard the flight. It also had the 1st joint space experiment that China has ever done. It tested reactions of various forms of life to weightlessness and radiation, jointly done with Germany. This success means that China will proceed to send another Shenzhou to the small space station with astronauts aboard in a few months.

Neutrinos – More scientists have repeated measuring neutrinos speeding across Europe, from the Large Hadron Collider (LHC) near Geneva, Switzerland to a laboratory in Italy. As reported here in November, the 1st time this experiment was performed, it found neutrinos moving just faster than the speed of light (100.002%), an impossibility according to Einstein's Special Relativity. But this time they used much quicker pulses of neutrinos (lasting only 3 nanoseconds), since that could have been a source of error. The result was the same as the 1st time. There are still many other possible sources of error that are being checked, including a possible problem in synchronizing the clocks used at the LHC and the Italian lab. The Fermilab in Illinois is attempting to measure the speed of neutrinos to confirm or deny this result.

Instant AstroSpace Updates

NASA has released images taken by Cassini of a **huge storm on Saturn** that started December last year, grew within 2 months until its clouds circled the entire planet like a latitude line, and whose clouds have remained for about a year, though the convective center (rising heated atmosphere) lasted only until last June. Cassini's instruments detected the storm's lightning for about 200 days, the longest Saturnian storm ever observed.



A star has been found rotating at 1 million mph (1.6 million km/h), the **fastest rotating star** known, 100 times faster than the Sun. Centrifugal force would tear it apart if it were any faster.

Astronomers have found 2 exceedingly **massive black holes** at the centers of relatively nearby galaxies, NGC 3842 and NGC 4889, each near 10 billion solar masses, making them the largest black holes known, at least in the region of the Universe close enough to get accurate mass measurements.

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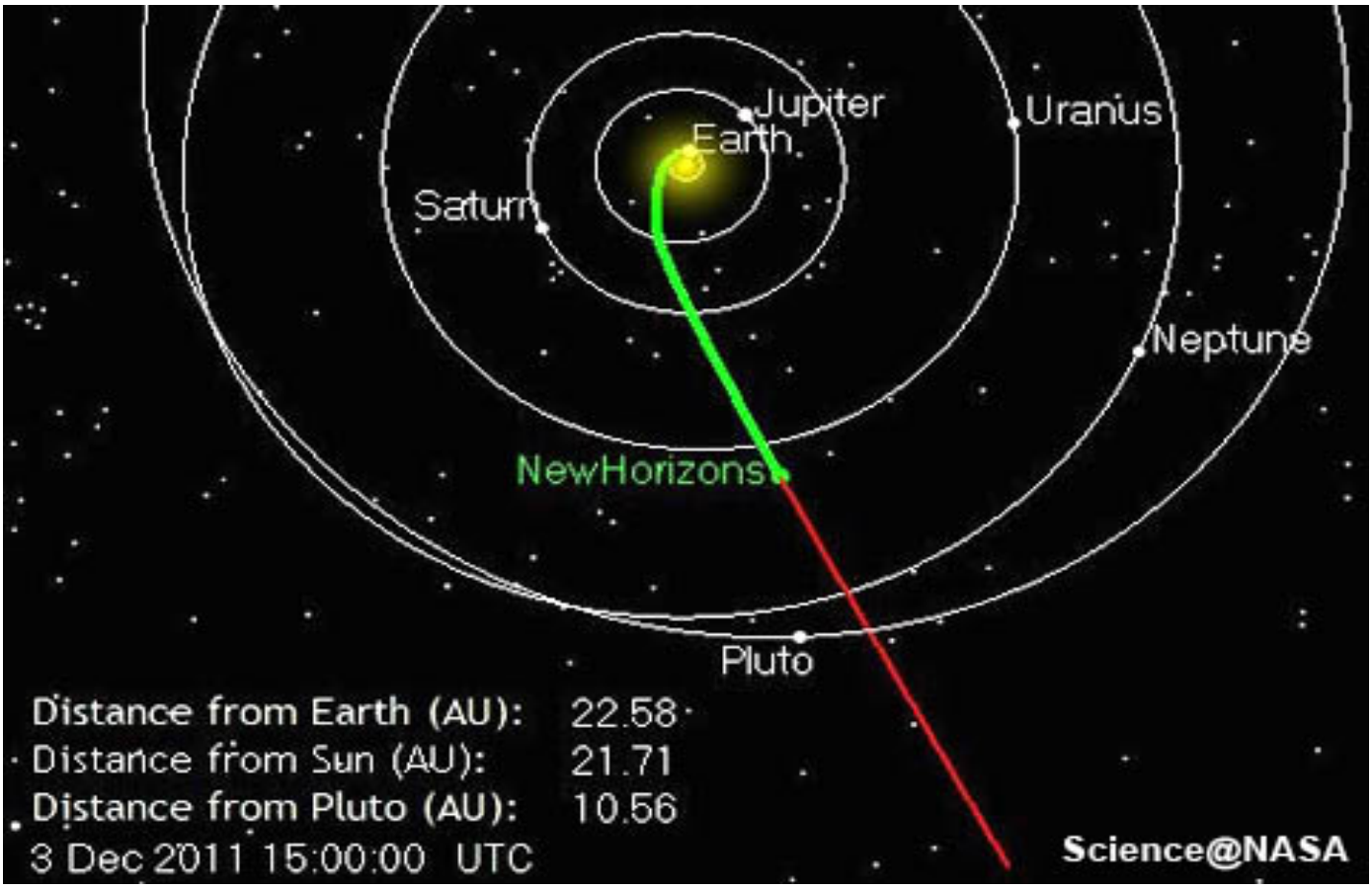
A new study of the absorption by water ice of infrared light suggests that exoplanets orbiting red dwarf stars (which radiate more infrared, and are more common, than hotter stars) will be somewhat warmer than previously theorized. This means that the **habitable zone**, that is, where liquid water can exist on a planet, will for red dwarf stars extend 10 to 30% farther than previous calculations.

The 2nd flight of the **X-37B**, an unmanned space plane about ¼ the size of the Space Shuttle, has been extended past its original 9 month plan. The US Air Force, owner of the vehicle, is still not saying exactly what its purpose is.

The next 3 astronauts for the **International Space Station** are scheduled to launch on a Russian rocket December 21, returning the station to its full crew of 6. The 3 represent the USA, Russia, and Europe.

New Horizons (Pluto mission) is now closer to Pluto than any other spacecraft ever was, even though it is still 3.5 years from reaching the former planet. The New Horizons cameras still show Pluto as just a dot, and will continue to do so until late 2014.



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Wayne (Mr. Galaxy) Johnson remembers John as spearheading the establishment of the 20 acre Anza Observatory site where the 22 inch Kuhn telescope now holds court, along with Bill Kuhn, who designed and built the telescope. He also credits Don Lynn and Charlie Oostdyk for designing much of the infrastructure of the site; and, along with many volunteers doing most of the physical labor. According to John, it was Jack Child who found the Anza site.

During John's first term as OCA club president they incorporated the club and changed its name to Orange County Astronomers, with the help of Byron Groves, later John's attorney and a long time member and advisor to the club. John continued to do astrophotography from both Anza and his home roll-off observatory in Orange. Sales of his astrophotos around the world help to fund college for both of his children, Mark and Sharon. John served two more terms in the 1980's as OCA president, during which the club grew to over 700 members. He also served as WAA president.

Those pre-TV age years of reading National Geographic magazines instilled in John a giant urge to travel, and to see for himself, the magical sites he had read about as a child. His trips took him to places like Angkor Wat, Cambodia, Northern Canada, England, Hawaii, Indonesia, New Zealand, Chile, Spain, France, Italy, Greece, Austria, and Kosovo, among other, chasing solar eclipses, archeo-history, and historic observatories.

Before John finally settled on retiring to Springville, he spent some time and travel eliminating some other choices. The final choice had to have a dark sky that he could observe from home. The big island of Hawaii, southeastern Arizona, Mexico, and the Sierra foothills were on his shortlist. Jim Leonard remembers John visiting him and checking out the area around Inyokern.

So John settled into Springville, which became a Mecca of sorts for amateur astronomers, including Msgr. Ron Royer, Dave Bird and the Biunnos. He still made forays out into the rest of the world searching for eclipses and other astronomical sites and especially loved the British Isles. He also assisted at local astro events, making the sky more accessible to all.

He had a full life, many friends and leaves a body of work in astrophotography and scenic and portrait photography as well as a book, "Observing the Constellations", which even though it is out of print, continues to be sought after by many amateur astronomy enthusiasts. Nowhere, in anything that John wrote about himself, was there any mention of himself as the leader he was in others' eyes. Like those who are really visionaries, he was, to the last, also humble. Vaya Con Dios, John! ■

Global Astronomy Month 2011 Final Report

Thilina Heenatigala

The final report of GAM 2011 activities has been released...

Putting the world spotlight on astronomy for the entire month of April 2011, Global Astronomy Month 2011 (GAM 2011) - Astronomers Without Borders' second annual month-long sky celebration-brought together new ideas, new opportunities, and night-sky enthusiasts worldwide, all affirming and celebrating One People, One Sky.

More than 40 programs and events filled the month of April 2011 during the second annual Global Astronomy Month. Enthusiasts in more than 140 countries took part in a broad range of programs highlighting Saturn, the Moon, the Sun, a meteor shower and more. Observing was the most common program activity. Thousands viewed through telescopes provided by amateur astronomers and science centers, and online programs with live interaction between the host and attendees extended the opportunity to thousands more regardless of location or local circumstances. The importance of dark skies was also stressed in several programs along with new, innovative programs such as the popular Astropoetry Blog and a live, online performance that included images sent on a half-million mile round-trip to the Moon and back.

The expansion of programs and participation just one year after the inaugural Global Astronomy Month demonstrates the desire for a central celebration of astronomy following the success of the International Year of Astronomy 2009. Global Astronomy Month 2012 is sure to be even greater.

GAM2011 was a huge success thanks to YOU! I hope we all can work together for GAM2012!

Download the GAM 2011 Final Report at http://www.astronomerswithoutborders.org/gam-2011-final-report.html Feel free to circulate further.

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REMEMBRANCES OF JOHN SANFORD

from Monsignor Ronald Royer:

"I met John Sanford at OCA meetings. In 1994 I bought my first digital camera from him, the Starlight Xpress. He was looking for a place to retire and kept telling us that everywhere he studied there was a problem till he found the property above Springville and inspired me to move up here too, which I did in 2002.

"He seemed to never sleep and kept me posted on current sky events and we had a contest on who got the better images. An example of his tirelessness was January 31. 2003 when in the evening he had just driven from down south from a funeral, I think it was for Steve Kufeld, not sure. He called me and asked if I was going to get up early in the morning to watch the space shuttle Columbia pass over us to the north. I said no because I had guests, Steve Padilla and Mary Cragg. And I said after your long drive and all you shouldn't get up either just to see a streak in the sky. In the morning Steve woke me up and said John just called and wanted to know if shuttle reentries had flashes. Mary said NO! WE CALLED HIM AND HE SAID HE HAD TAPED IT. So up we drove and looked at his tape and Mary had a phone # for NASA since she was working with them on a project. Then we called the News stations in Fresno and before the day was over every major network was up interviewing John. They wanted to include me but I refused saying that if John had listened to me he would have missed the beginning of the disaster as it started over Mono Lake.

"John was always pushing light pollution concerns up here with great success. I still hear from the newly built local fire station how he threatened them about shielding their outside lights and he won! I will miss him coming to dinner complaining that he didn't care for our healthy fresh food! And his prodding me to get out at all hours of the night. May he rest in peace, he deserves that." ■

After retirement, John Sanford completed his Starhome observatory complex near Springville, CA in 2005. He always had a standing invitation for OCA members to visit and observe with him. Many members took advantage of his hospitality and advice over the years.

From the Editor:

In putting together this memorial issue for John Sanford, I was initially frustrated by the lack of photos of John available on the website. It is notable that part of the reason may be because John *took* a substantial number of the photos on the website.

In the short time I knew him I remember John as a man of action, not patient merely to listen to an idea if someone did not have an action plan to accompany it, and the willingness to apply oneself to the task. The note on his invitation to the Starhome site sums up his attitude perfectly: "Read and Act!"

The things he accomplished: starting the fine organization we know and love today, creating the Anza site, the newsletter you're reading now, and (not least of all) his acclaimed photography program at Orange Coast College are a testament to his energy, enthusiasm, and motivation. We will all benefit for years to come from his contributions. ■

This photo of the 2004 supernova (indicated by lines) in NGC 6946) is emblematic of John Sanford's photography. This image was created using a StarlightXpress SXV-H9 imager and a C-14 at f/4. Four unfiltered 30-second exposures were composited to create the image.

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