

Comet Tuttle is seen with the Whirlpool Galaxy (M33) in this image taken by Don Lynn from New Mexico on December 30, 2007. The comet images were stacked separately from the galaxy images in this exposure. We can't guarantee a comet, but if you're interested in seeing M33 and 109 other great objects, be sure to join us for our annual Messier Marathon this month!

OCA CLUB MEETING

The free and open club meeting will be held Friday, March 13th at 7:30 PM in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange. This month, Dr. Gary Peterson of San Diego State University will discuss the absence of water on Mars.

NEXT MEETING: April 10th

STAR PARTIES

The Black Star Canyon site will be open on March 21st. The Anza site will be open on March 28th. 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, March 6th at the Centennial Heritage Museum at 3101 West Harvard Street in Santa Ana.

GOTO SIG: TBA

Astro-Imagers SIG: Mar. 17th, Apr. 21st

Remote Telescopes SIG: Mar. 25th, Apr. 22nd

Astrophysics SIG: Mar. 20th, Apr. 17th

Dark Sky Group: TBA

President's Message

By Barbara Toy

In spite of the economic woes at the national, state and local levels, which unfortunately are affecting many of our members all too directly, the year continues to move along with surprising speed. Here we are in March already – the first quarter of 2009 is almost gone, and spring is coming on. This should be a time of hope and renewal, and I hope that is the case for all of you this year, in spite of all the grim news that's been buffeting us over far too many months.

As I write this, we've been getting rain, with more on the way – which should give us some nice wildflowers out at Anza and along the roads going out there. We'll need to clear a lot of the growth that comes with the flowers to avoid problems in the fire season (weed clearance needs to be done by the end of May), but that shouldn't stop us from enjoying them!

Messier Marathon

March is the month of the spring equinox, which is notable in the amateur astronomy world because it happens to be the best time of year to see all 110 Messier objects in one night. In theory, you can do this around the autumnal equinox as well, but the positioning of the objects is better in spring, so that's when we do the annual Messier Marathon. The objective of this event is to find as many of the Messier objects as you can in one night. Some of the objects can be very hard to see because they set right after the sun or rise just before it – those tend to be the ones that people have the hardest time collecting. Another factor that gets in the way of completing the Marathon is the desire to take a nap in the early morning hours when you've collected all of the Messier objects that are up and are waiting for the next batch to rise – many folks who try this wake up from their nap in full sunlight and miss the second part of the Marathon. So, if you do decide to take a nap, be sure to set an alarm to wake you up in time to finish the list!

Our Messier Marathon this year will be at the March Anza star party – please come out and join in the fun! We'll have forms for tracking your objects available at Anza House and the club observatory, as well as on the website for downloading. The Kuhn will be collecting as many of the objects as it can (the fact that it's a computer-controlled GoTo system is generally offset by the fact we usually have more than one person looking at each object as we find it, so we take more time per object than many of the contestants – but that's all part of the fun!). One of the benefits of the Marathon is that you wind up looking at a lot of Messier objects that you may not look at otherwise, and some may inspire you to add them to your list of objects to check on more frequently. Of course, particularly as you get tired, it can be hard to see many meaningful differences in all those open clusters or all those small, dim Virgo galaxies – with them, the challenge is to be able to say you've looked at them all that night.

The Black Star Canyon star party, which is the week before the Anza star party, is actually closer to the equinox and would also be a great night to do the Marathon. Unfortunately, we only have access to that site until midnight, so anyone who wants to try it there that night would only be able to capture the objects visible from sunset to midnight, which would be about the first half of the Marathon. That can still be fun and a good challenge, especially if you are trying to find the objects by star hopping or other non-computerized means. It could also be good practice for doing the full Marathon the following week at Anza...so why not download the form from the website before you go out to Black Star Canyon and give it a try? Or you could go out to Anza that night and do the full Marathon, even though the club's formal Marathon isn't until the following week.

Remember to turn in your form showing the objects you found – you can turn them in to me at Anza after the Marathon or at the next club meeting, or mail it in to the club post office box. What should happen after you turn it in is that you'll get a genuine OCA Messier Marathon certificate, commemorating the number of objects you found during the 2009 Messier Marathon and with what equipment. If you don't get your certificate, please let me know – sometimes things get lost along the way. And you don't need to do your Marathon during the formal event at Anza – just send in your list of the all the objects you found in one night, whether that was at Anza or not, to get your 2009 certificate.

We Need Help For IYA 2009 / 100 Hours of Astronomy

Things are really heating up on the 100 Hours of Astronomy event, which is Thursday, April 2nd through Sunday, April 5th. First on our calendar is a public outreach/viewing event scheduled on April 2nd at O'Neill Regional Park in Trabuco Canyon. This is our kick off event locally for the 100 Hours of Astronomy, and we expect it will be well attended – volunteers with telescopes will be very welcome!

The UCI Observatory is planning public observing events for Friday, Saturday and Sunday nights, using the telescope in the observatory near the UCI campus. They are hoping that we will be able to provide some volunteers with telescopes each of

those nights to help them out – they generally get a good turn-out for their viewing events, and hope to introduce a lot of new people to the pleasures of what can be seen in the night sky even in very urban Orange County.

Making our astronomical lives even more interesting, we have both the Beginners Astronomy Class and one of our regular school outreach events at Jordan Intermediate School in Garden Grove on Friday, April 3rd. Dave Pearson, Steve Short and I plan to handle the Beginners Class as usual, but we definitely need volunteers for the school event – with the UCI event that night, as well, our usual pool of outreach volunteers is likely to be stretched very thin without help from other members who don't regularly come out for outreach events.

I talked about the observing event planned by Irvine Valley College last month. That will be on Saturday, April 3rd, and will be at the Irvine Spectrum shopping center. They need volunteers with H-alpha or sodium filters for solar observing from 12:00 to 3:00 p.m., and then they would welcome additional scopes for evening observing from around 6:00 to 10:00 p.m. – the times may change as plans are finalized, so please check the calendar for the latest times as we get closer to the event. Since we also have another viewing night with the UCI Observatory that night, our regular volunteers will be spread thin again – so we will really need more help from beyond our usual pool of outreach volunteers to make these events fully successful.

Further complicating matters, one of our members, Richard Stember, has been organizing a series of activities at the Mission Viejo library for that Friday and Saturday as part of the 100 Hours celebration, and is also hoping that we can muster some volunteers to help him out. If you are interested in participating, his email address is: avatarsci@msn.com. You can see the full listing of the planned events on his website at <http://socialastronomy.com/AstronomyMVLibrary.html>; it looks like quite an exciting program!

Please contact Craig Bobchin or Jim Benet if you can help out with any of the events other than the one at the Mission Viejo Library. If you have a portable telescope or astronomical binoculars and can come to just one of the sessions that we have scheduled, that would be a tremendous help – and a lot of fun!

If you have some other outreach event of your own planned for that period, please let us know and ask to have it put on the website calendar, at least. We'd like to know about all of the events our members are involved in for the 100 Hours event, including any impromptu sidewalk astronomy any of you may do – it all helps the overall success of this event.

The 100 Hours of Astronomy promises to be a very busy, exciting time – please be sure to encourage your family and friends to take advantage of the observing activities going on during these four days to see something of the pleasures of the night sky and the beauties of our closest star for themselves!

Anza Update

On the somewhat mundane side, the control knobs for the showers in the two main bathrooms at Anza House have been replaced, and hopefully will last us a long time. If you notice any problems with them or with any other faucets in Anza House, please let Steve Condrey or me know about them.

As we have had more people using the site through more of the year, our power usage has understandably increased. Our power bills for the site have gone up considerably because of this and because of overall increases in the cost of electricity – please be at least as careful about using electricity out at Anza as you would be in your own home. In particular, please be sure all lights are off in Anza House (including the outside lights on the front and back of the building) as well as the heat or air conditioner (actually, swamp cooler) if you are the last to leave Anza House, be sure the pump and water heater are turned off at the club observatory if you are the last to leave that area, and be sure that nothing unnecessary is left on at any of the pads or observatories you may be using while you are there and also when you prepare to leave.

Regarding the new development on the site, Gary Schones did a rough layout on the ground of areas where observatories could be placed in the Last Members area and the area to the northeast of that; if you notice flags in that area, that is why they are there, and we ask that you leave them in place. It appears that we have room for around seven observatories in this expanded area, once it's cleared, and we plan to clear a new "Last Members" area as part of this project to the northwest of the current area, so the members who use it will have a comparable area where they can set up in spite of this development.

We do not know if or when we will be able to work things out with the County so we can go ahead with the more extensive work we planned for the northwest portion of the site, but this modification to the overall plan will allow the people on the Observatory Waiting List who are ready to finalize their plans and begin construction to get started in the next few months. Right now there is more interest in new observatory sites than new pad areas, so we are not planning any new pad areas in the near future.

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AstroSpace Update

March 2009

Gathered by Don Lynn from NASA and other sources

Mars methane – In 2003 methane was found in the atmosphere of Mars. Continuous observation since then with ground-based telescopes has produced a map of regions where methane appears, and showed that the methane soon is destroyed by various chemical means. The methane appears each Mars year during spring and summer. It has been suggested that seasonal evaporation of ice within fissures could release methane trapped underground. Some of the plumes of methane were accompanied by water vapor, and some were not. On Earth, methane is produced by many forms of life and by several geological processes. Methane was not expected on Mars from any of these sources. The areas where the plumes are found show evidence of ancient ground ice or water flows, though it is not known if these are connected. It will take future missions to track down the source of the methane. Since the Mars Science Lab (giant rover) was recently postponed for 2 years, some scientists are suggesting we now have time to change its landing site to be one that experiences methane plumes.

Mars rovers Spirit and Opportunity each suffered a disruption to its electronics by a particle, possibly a cosmic ray. Both were tested and resumed operations. Spirit stopped a drive, failed to store its day's data, and had problems finding the Sun to orient itself before resuming. Before the problem Spirit had investigated a bright patch and determined it is silica, similar to a patch found in 2007. That find was attributed to either a hot spring or a steam vent. Opportunity temporarily lost control of its Panoramic Mast, which holds cameras and the infrared spectrometer. After several days of testing, the rover resumed its trek to Endeavour Crater, about 7 miles away, which is expected to take up to 2 years. It has completed 1.6 miles since leaving Victoria Crater some months ago.

Spirit's solar panel output jumped from 210 watt-hours to 240 on February 6, apparently due to wind blowing some of the dust off. While this does not sound like much, it doubles the amount of power available to instruments and driving, since basic survival and communications consume 180. Dust remaining on the solar panels is thick enough that only 28% of the sunlight penetrates. A wind beneficial to Spirit has not occurred since June 2007.

Martian hot springs – Data from the Mars Reconnaissance Orbiter suggest that ancient hot springs existed in Vernal Crater in the Arabia Terra region of Mars. The research team says that striking similarities between features seen there and hot spring regions on Earth provide evidence of an ancient Martian hot spring environment. Hot spring deposits would be ideal locations to search for evidence of living organisms, if life forms have ever been present on Mars.

More Martian water – Scientists have found further evidence for a large role played by water in shaping the Martian landscape. The team surveyed geological features in about 200 craters found in the Arabia Terra and Hellas regions of Mars. They looked specifically for these types of features: lobate flows, channels, crater-wall valleys, gullies and alcoves, arcuate ridges, and debris aprons. All these features suggest a landscape shaped by liquid water and/or ice. They found that some types of features tended to face the equator, and others tended to face the pole. This suggests that solar heating on crater walls affects formation of these features. The features may have been created by multiple cycles of ice-sheet formation due to changes in the tilt of the planet's axis of rotation.

Martian financing – NASA has revealed how they plan to finance 2 more years of work on the Mars Science Lab that is now required because of the launch delay recently announced. Money will be taken from the Outer Planets Flagship Mission and Mars landers in 2016 and beyond. By combining the Flagship mission with a similar European mission a year later, and combining the NASA Mars Lander of 2016 with the European ExoMars, sufficient money can be removed from those projects without losing any missions. If combining does not occur, then those 2 missions may be delayed or scaled back.

Cassini (Saturn mission) has taken images of lakes of liquid methane and other hydrocarbons on Titan that did not exist in images taken a year before. Extensive cloud systems seen in the area suggest that the new lakes are the result of large methane rainstorms. The methane lost and added to the atmosphere from known sources does not seem to balance. So it is thought that there must be a huge reservoir of underground methane being slowly released to achieve balance. The lakes are found chiefly near the poles, not in equatorial regions. Scientists are investigating the cause of this.

Moon's core – A new analysis of an Apollo Moon rock, done with a robotic magnetometer, showed that it must have been subjected to a magnetic field for millions of years during a period about 4.2 billion years ago. This is likely to have been produced only by a dynamo effect in a molten iron core, like the Earth's current magnetic field. Other sources of magnetic field would not have persisted for millions of years. This is the strongest evidence that the Moon had a molten iron core then. The magnetic field during that period was about 2% as strong as the Earth's field is today.

Moon's face – It was expected that the side of the Moon that always leads in its orbit should run into slightly more stuff and be slightly more heavily cratered. So they counted just to make sure. While that is true with younger craters, the opposite is true of older craters. This may mean that billions of years ago the Moon made a half turn, that is, what is now the back side, always facing away from Earth, was once the front side. A large impact with an asteroid could cause such a turn. Further work will be done to confirm this. Much new data is becoming available with the Japanese and Indian lunar orbiters imaging the Moon.

Moon's rigidity – New altitude maps of the Moon have been made using data from the Japanese Kaguya/SELENE lunar orbiter. It is the most detailed such map yet. The highest point was found on the rim of Dirichlet-Jackson basin, and the lowest point in Antoniadi Crater, with over 12 miles of vertical difference. The roughness of terrain is affected by the rigidity of the crust material; flow of crust over time smoothes out mountains and craters. Analysis of the new map showed that the Moon's crust is more rigid than that of the Earth. The scientists took this to imply that the Moon's crust is practically devoid of any liquid (such as water) that would tend to lubricate crust movement.

Small exoplanet – Last June astronomers announced the discovery of an exoplanet (one outside our solar system) that they calculated to be only 3.3 times the Earth's mass. This is one of the smallest exoplanets yet found. The discovery was made by microlensing, in which the gravity of the planet bends light of a more distant star when it passes in front. It was believed to be orbiting about a brown dwarf, a star so small that hydrogen fusion fails. A new analysis of the microlensing data concluded that the planet instead orbits a red dwarf star. Changing the mass of the star changes the calculated mass of the planet, and the new result is even smaller, only 1.4 times the Earth, making it the exoplanet with the smallest known mass. The planet orbits its star at about the same distance as Venus does our Sun. But orbiting such a dim star, the planet is probably frozen. Observations are planned for April and May on the Very Large Telescope in Chile to verify that the star is a red dwarf.

Neptune-like exoplanet – The HATNet of automated telescopes in Arizona and Hawaii has discovered another exoplanet (the 11th by this network) about the size of Neptune. It was (for several days) the smallest planet discovered by the transit method, that is, by seeing it pass in front of its star. The newly found planet's diameter is 4.7 times and mass 25 times those of Earth, while Neptune's diameter is 3.8 and mass 17. It is the 335th exoplanet discovered. It orbits very close to its star, completing its year in only 4.88 Earth days, and raising its temperature to around 1100° F. There are signs of a second planet orbiting the same star, and radial velocity measurements are being made to confirm this. The planet is in the field of view that is going to be monitored by the soon-to-launch (March 5) Kepler planet-finding spacecraft, which is expected to greatly refine its known properties. Kepler should find planets as small as Earth.

CoRoT (planet finding space telescope) has found, by the transit method, an exoplanet slightly less than twice the diameter of the Earth. From its size, this would likely be a rocky planet like Earth or its immediate neighbors. It orbits so close to its star that its year is 20 hours, and its surface is 1800 - 2700° F. It lies about 450 light-years away.

Hot exoplanet – The Spitzer infrared space telescope has observed a planet that heats up to red-hot temperatures in a matter of hours, due to its eccentric orbit about its star. It gets about as far from its star as Earth does from the Sun, then plunges in far closer than Mercury. The planet takes about 111 Earth days to orbit its star, but spends most of the time at the farther distances. In 6 hours near closest approach the planet's temperature rose from 980° to 2240° F. If you were on the planet, you would see its star increase in brightness by almost 1000 times moving from the far to near point in the orbit. The planet rotates around its axis about every 34 hours. This brings the hot spot (from passing close to its star) in and out of view every rotation. The hot spot cooled off quickly as the planet receded from its star. The planet disappeared for awhile behind its star, which allowed easy separation of the light from the planet from that of the star.

Asteroid size – Using 2 of the 8-meter telescopes of the Very Large Telescope in Chile, combined as an interferometer, astronomers were able to demonstrate a new technique to measure the size of an asteroid. The method has the ability to resolve asteroids as small as about 9 miles in diameter at the distance of the main asteroid belt. This is much better than direct imaging has produced, even with adaptive optics. It should make hundreds of times as many asteroids subject to size measurement. The first subject of the technique was asteroid Barbara, which was found to consist of 2 asteroids, of diameters 23 and 13 miles, separated by 15 miles. As soon as the orbit of the 2 components about each other is measured, it will be possible to calculate their masses and densities.

Star formation – Computer simulations of the formation of massive stars generally are unable to produce stars more than 20 times the Sun's mass, because massive stars shine so brightly so soon that they blow away the raw material before accumulating larger mass. Yet lots of stars are more massive than this. A new more detailed simulation, which took months to run on a supercomputer, shows that the light punches channels and escapes in certain directions, while raw material remains in others and continues to fall in, causing the star to grow more massive. In addition, clumps break off to form companion stars, many of which collide with the primary star to add to its mass.

Dust fountain – Dust about a star is usually dissipated within 10,000 years, so its presence forms a very small part of the life of a star. How dust forms and gets distributed in space is not well understood. A group of astronomers has observed a double-star system that seems to be making a fountain of dust, and may help understand dust formation. The system lies within a nebula known as the Red Rectangle, which is about 2300 light-years away. One of the pair is a post-asymptotic giant branch star (post-AGB), a type of star that astronomers regard as a likely source of dust. These stars have already fused all the hydrogen in their cores and have collapsed, and are fusing helium instead. During the transition from hydrogen to helium, these stars lose an outer layer of their atmospheres. Dust may form in this cooling layer. In a double star, the material may form a disk about the companion star, and form jets that blow part of the material out into space. The post-AGB star in the Red Rectangle is far too hot to allow dust condensation within its atmosphere, yet a ring of dust encircles it. The new observations seem to indicate gravitational interactions between the 2 stars may help explain this. The observations were made to determine the source of intense ultraviolet radiation in the nebula, and the conclusion is that the source is hot material in the dust disk about the companion star. So the observations are shedding light on dust production, as well as the ultraviolet source.

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Western Amateur Astronomers Board Meeting Notes

by Tim Hogle

Once again the Board of the Western Amateur Astronomers (WAA) met in February at John Sanford's home in Springfield, California. As most of you are aware, WAA is an umbrella organization of astronomy clubs of which OCA has been a long time member and supporter. 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. John Sanford was several times president of OCA and a very active member of the club for many years before retiring and moving to Springfield ten years ago, where he built Starhome, a very nice and spacious private observatory with a roll off roof, two piers supporting a 14" Schmidt Cass and a 6" refractor, as well as additional living quarters and a meeting room.



WAA's most well known function is annually awarding the prestigious G. Bruce Blair Medal to an individual who has made truly outstanding contributions to amateur astronomy. This year's award recipient is Mike Simmons. Many will recall Mike as being a featured speaker for at least two OCA meetings, where he talked about his visitation and collaboration with amateur astronomers in Iran and Iraq, and most recently about two years ago his trip there with an international group of amateurs and his subsequent decision to found an organization, Astronomers Without Borders (<http://www.astronomerswithoutborders.org>), which endeavors to promote goodwill and meaningful communication between amateurs in the Western world with those in the Middle East, where the interest in astronomy is very high but availability of telescope equipment is extremely limited, as well as growing it into a global connection, especially in other areas of the world where similar conditions exist.

The Blair award is partially for this effort, but also for his consistent public-minded efforts in astronomy for nearly 30 years. Other activities include: founding president, continuing board member of and docent for the Mount Wilson Observatory Association, president and board member of the Los Angeles Astronomical Society, public telescope operator at Griffith Observatory, and founding instructor and coordinator for the Consortium for Undergraduate Research and Education in Astronomy (a program for students who live at Mt. Wilson for a week of intensive astronomy instruction). Congratulations, Mike!

The Blair Medal has a history back to 1954 and recipients are listed on the WAA web site at <http://www.waa.av.org>. Included are several OCA members and nominees. This year's award is to be presented at the Riverside Telescope Makers Conference, as it has for the past several years.

One more item for those with artistic interests. WAA is still looking for a replacement for their 50-plus-year-old logo, an effort that has been going on for some time. So far, the response has been rather limited. Although we have stopped short of actually having a logo contest, there is an incentive of \$50 to be awarded to the creator of a selected design, and you may be assured that full and eternal credit will be given to this person as well. There are no specific requirements attached to the design, but it should contain the letters WAA and/or the full name. Rough sketches are fine to start with. My contact info is on the back of the Sirius Astronomer if you would like to discuss further what is desired or to submit entries.

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.

FOR SALE: NexStar 4se Maksutov Cassegrain Telescope; two years old in great condition. Includes a Celestron aluminum case with four eyepieces (a Celestron 32mm Plossl, a 25mm Plossl, a 12.5 mm Plossl, and a 2x Barlow) and 4 filters. The telescope and the other items listed cost me just under \$800.00 and I am selling it for \$450.00. Contact Brent Spaulding at 714-963-4560.

FOR SALE: brand-new items - 8" F/6 Discovery Optics 1.5" Pyrex Mirror cell; 8" University Optics Alum Mirror Cell; Vega-HP1-1.25" Focuser (Japan Made); Vega-3 Low Profile Helical 2" Focuser; 48 Rini2 Eyepiece in Bolt Case (this item not new but seems to be in good condition. Will sell these items separately for lowest price or as a package for \$200 o/b/o. Contact Doug 562-598-6103

NASA's Space Place

Where did all these gadgets come from?!

Ion propulsion. Artificial intelligence. Hyper-spectral imagers. It sounds like science fiction, but all these technologies are now flying around the solar system on real-life NASA missions.

How did they get there? Answer: the New Millennium Program (NMP). NMP is a special NASA program that flight tests wild and far-out technologies. And if they pass the test, they can be used on real space missions.

The list of probes that have benefited from technologies incubated by NMP reads like the Who's Who of cutting-edge space exploration: Spirit and Opportunity (the phenomenally successful rovers exploring Mars), the Spitzer Space Telescope, the New Horizons mission to Pluto, the Dawn asteroid-exploration mission, the comet-smashing probe Deep Impact, and others. Some missions were merely enhanced by NMP technologies; others would have been impossible without them.

"In order to assess the impact of NMP technologies, NASA has developed a scorecard to keep track of all the places our technologies are being used," says New Millennium Program manager Christopher Stevens of the Jet Propulsion Laboratory. For example, ion propulsion technology flight-tested on the NMP mission Deep Space 1, launched in October 1998, is now flying aboard the Dawn mission. Dawn will be the first probe to orbit an asteroid (Vesta) and then travel to and orbit a dwarf planet (Ceres). The highly efficient ion engine is vital to the success of the 3 billion mile, 8 year journey. The mission could not have been flown using conventional chemical propulsion; launching the enormous amount of fuel required would have broken the project's budget. "Ion propulsion was the only practical way," says Stevens.

In total, 10 technologies tested by Deep Space 1 have been adopted by more than 20 robotic probes. One, the Small Deep Space Transponder, has become the standard system for Earth communications for all deep-space missions.

And Deep Space 1 is just one of NMP's missions. About a half-dozen others have flown or will fly, and their advanced technologies are only beginning to be adopted. That's because it takes years to design probes that use these technologies, but Stevens says experience shows that "if you validate experimental technologies in space, and reduce the risk of using them, missions will pick them up."

Stevens knew many of these technologies when they were just a glimmer in an engineer's eye. Now they're "all grown up" and flying around the solar system. It's enough to make a program manager proud!

The results of all NMP's technology validations are online and the list is impressive: nmp.nasa.gov/TECHNOLOGY/scorecard/scorecard_results.cfm. For kids, the rhyming storybook, "Professor Starr's Dream Trip: Or, How a Little Technology Goes a Long Way" at spaceplace.nasa.gov/en/kids/nmp/starr gives a scientist's perspective on the technology that makes possible the Dawn mission.



Dawn will be the first spacecraft to establish orbits around two separate target bodies during its mission—thanks to ion propulsion validated by Deep Space 1.

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

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Ultra Compact Dwarf (UCD) galaxies were discovered in 1999. They are more than 1000 times smaller in diameter than our Milky Way, but far denser in mass. Yet they do not seem to be particularly denser in numbers of stars. Some astronomers have blamed dark matter for the unexpectedly large mass. A new theory has been presented: UCDs start extremely dense in stars, which then collide often, forming more massive stars. More massive stars use up their hydrogen fuel quickly, then explode as supernovas, becoming black holes or neutron stars, which are difficult to see in visible light. Thus the excessive mass is dead stars.

FAST - China broke ground for construction of a 500-meter (1640-feet) diameter radio telescope, similar to, but considerably larger than the Arecibo one, now the world's largest. It is being built fixed to the ground in a natural bowl, as is Arecibo, but will be able to change surface shape so as to focus twice as far to any side of overhead. It will be called FAST (Five hundred meter Aperture Spherical Telescope). Completion is scheduled for 2014, and astronomers from around the world will be able to use it. Frequencies up to 3 GHz will be usable, with planned eventual upgrading to 5 GHz. Arecibo operates up to 10 GHz.

Hayabusa (asteroid sample return mission) has begun an 8000 hour burn of one of its ion engines, which will bring it back to Earth. A previous burn of 4 months was completed in 2007. Only one ion engine (of 4) is being used for the current burn because there is some evidence that some of the others are degrading. Indications are that the sampling mechanism failed, so there may be little or no sample of the asteroid aboard Hayabusa. Considering all the failures that this spacecraft has endured, it is something of a miracle that it now has a good chance of returning. A fuel leak and communications problems prevented it from starting back to Earth from the asteroid during the time window when the planets were properly aligned for the journey. It is now scheduled to parachute onto Australia in June 2010.

Instant AstroSpace Updates

One of the Iridium fleet of **satellites collided** with a Russian communications satellite (Cosmos 2251) that was long out of service, about 490 miles above Siberia, destroying both. About 600 fragments large enough to track from the ground were observed.

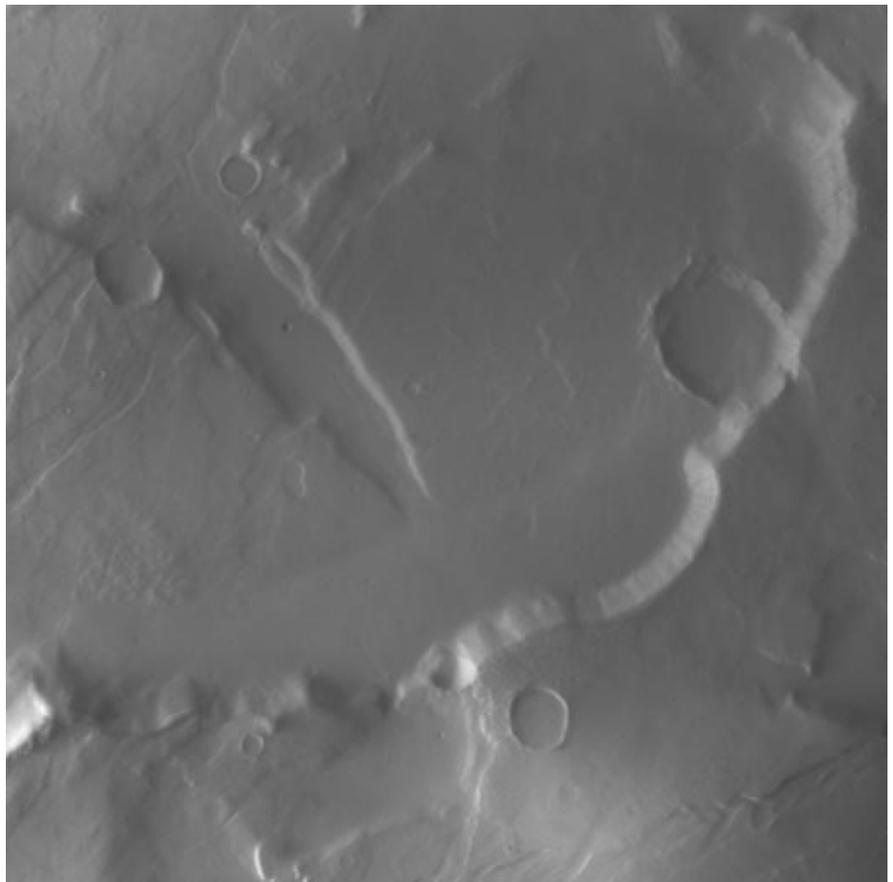
A team of scientists has claimed that data gathered by the Galileo spacecraft during its flyby of Venus many years ago indicate that large amounts of **granite** are found on that planet, though other scientists disagree with that conclusion. Granite would require water, formation of continents, and tectonic plate movement, which are believed by many scientists not to have ever been present on Venus.

Observations by the ground-penetrating radar on the Mars Reconnaissance Orbiter (MRO) show that the **Martian northern polar cap** is about 95% pure water ice. It was already known that the south polar cap, in contrast, is a mixture of water ice and dry ice (carbon dioxide).

MRO imaged a **cluster of craters** on Mars in September 2007 that were not there in a May 2003 image, indicating an asteroid broke up in the atmosphere and impacted the surface somewhere in that time span.

The European Space Agency has **extended** its Mars Express, Venus Express and Cluster missions, since all spacecraft are operating well. Each has completed its basic missions and at least one extension.

The schedule for repair of the **Large Hadron Collider** has been announced, and the particle accelerator will be restarted in September, with science beginning as soon as October.



This near-infrared image from the framing camera on NASA's Dawn spacecraft was taken near the point of closest approach to Mars on Feb. 17, 2009, during Dawn's gravity assist flyby. The image, taken for calibration purposes, shows a portion of the fretted and cratered northwest margin of Tempe Terra, Mars. The scarp of the highlands/ lowlands boundary is illuminated by the light of dawn, and traces of fog appear in the lower portion. The area covered by the image is about 55 kilometers (34 miles) across. Image credit: NASA/JPL/MPS/DLR/IDA, and the Dawn Flight Team

A Bit of Club History and a Generous Invitation...

Jim Leonard, who was very active in the club in its early days, retired several years ago and now lives in the Mojave Desert. He recently reminded me of his standing invitation to OCA members to visit him and take advantage of the very dark skies around his home. He says there is ample area for camping and setting up equipment, and conditions out there are often dark and cloudless when Anza is clouded in. If you're interested in taking advantage of his kind offer, please send me an email at btoy@cox.net and I'll put you in contact with him. He tells me, by the way, that he plans to come to RTMC this year, and I hope that all his old OCA friends will be able to visit with him there.

He also sent me the following account of the very beginning of the Orange County Amateur Astronomers (OCAA), which was the club's original name:

I had a telescope company called Stellar Scientific Instruments there in Santa Ana. We made our own mounts and tubes and [had] a hell of a polishing machine. Your historians have the photos and the S&T magazines with our ads.

That was when Ralph Ferguson, Mel Elsie and I were building scopes along with Tom Cave. Tom was using our mounts and tubes and we were using his finder scopes. Ralph and I started the Orange County Amateur Astronomers and I was the first President. Ralph was the VP. We switched it back and forth for a bunch of years and no one [else] would take an office. The first time we had a meeting that the Register ran an ad, 74 people showed up at my home. A two bedroom apartment over a garage on South Cedar Street. The land lady had a fit. We plugged the street with cars and it was a mess.

Well , Furgi and I got fed up doing all the work and dropped out of the club. It stayed active for a number of years and disbanded into the present OCA....



That's the apartment where it all started. Believe it or not!

Fortunately for us, Jim came back to the club later, as he had a pad in the Lower Pad area at Anza and (among other things) built the entrance gate to the site. Those like me who came to the club much later owe a real debt of gratitude to Jim and all the other earlier club members who did so much to make the club what it is today!

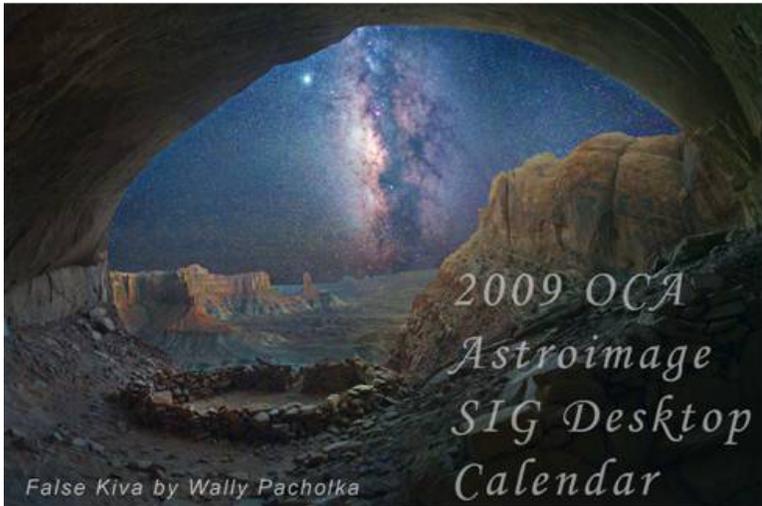
The recent bright comet Lulin was imaged by Don Lynn via an internet telescope in Australia on February 7, 2009. This is a one-shot, 18-minute exposure using a 106mm FSQ telescope with an SBIG STL 11000C imager.



Dave Radosevich and Don Lynn captured this image of the Horsehead Nebula between December 29, 2005 and November 28, 2008 using an 8-inch f/11 Maksutov with an SBIG ST8 imager. The image represents 305 seconds of footage captured in four sessions of 130, 30, 60, and 85 seconds.

STL

2009 OCA Astroimage SIG Desktop Calendar - Now Available!



With Images by John Sanford, Ray Stann, Larry Gershon, John Castillo, Craig Bobchin, Bruce Waddington, Pat Stoker, Don Lynn, Gary Schones, Dave Snope, Jim Windlinger, Dave Kodama, Bill Patterson, Alan Smallbone and Wally Pacholka!

15 months of images by OCA members to enjoy!



ONLY \$10!!!

See Charlie Oostdyk at the general meetings, or contact Barbara Toy or Alan Smallbone for information about ordering and picking up at other OCA meetings! Great Gift Idea!

NOTICE: Due to a problem with the well supply line, the water supply at Anza House will be very limited until the March Star Party when repairs can be made. Until repairs are made, the cistern is the only source of water for the house, and there is a ban on showers at Anza House until regular access to the well is restored. Thank you for your cooperation.

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