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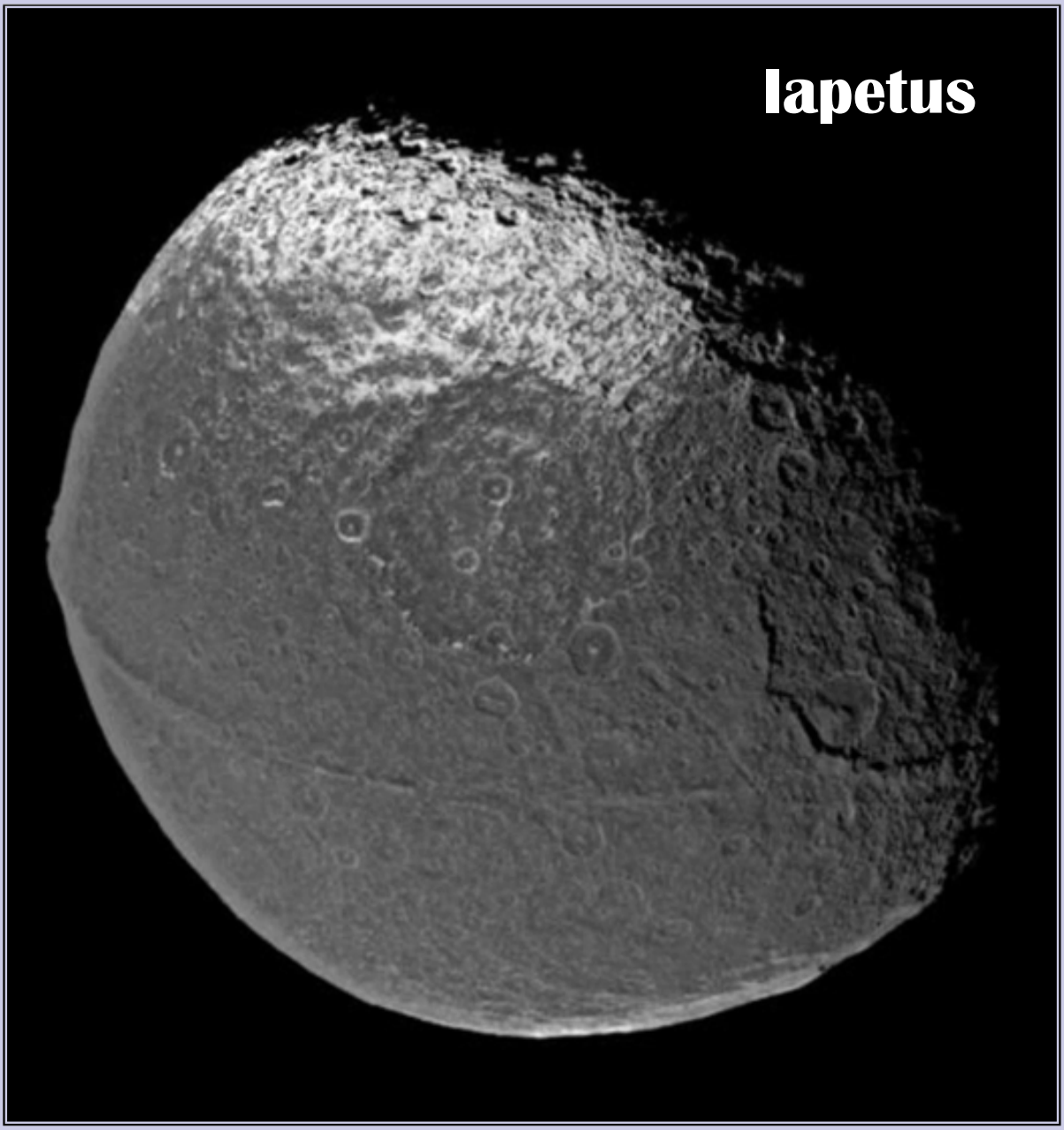

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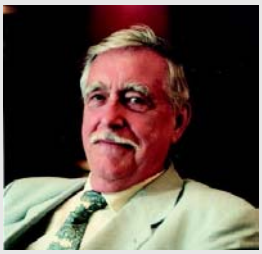


Club News, Features, and Information

JSCAS Web Pages
Home Page: http://www.ghg.net/cbr/jscas/
Newsletter: http://www.riverofstars.net/JSCAS/Starscan/starscan.htm
Star Party Information: http://www.riverofstars.net/JSCAS/StarParties/starparty.htm

El Paso Passes Light Pollution Ordinance

Ken Lester

Through the efforts of John Peterson, director of the Gene Roddenberry Planetarium, a new lighting ordinance was passed by a 7 to 1 margin by the El Paso City Council. John Paterson and Corey Stone, President of the El Paso Astronomy Club, have been working since at least 1992 to build public support for an outdoor lighting ordinance.

The ordinance, will take effect in three months and give everyone, including the city, 10 years to replace all lights with shielded lights. Beginning May 7th, when a light fixture rated at 1,800 watts or brighter is replaced, the replacement fixture must be shielded.

The issue of light trespass onto residential property was also addressed, allowing one neighbor to complain about a floodlight next door.

Violations of the ordinance are punishable by a fine up to $1,000 and are a Class C misdemeanor.

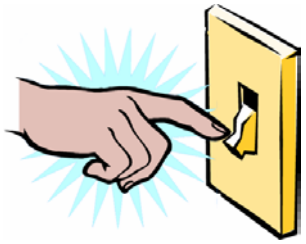
The only opponent of the issue, East-Central city Rep. José Alexandro Lozano, was quoted in the El Paso Times as saying; "To me, it's absurd that we have so many needs here and we're worried about lights."

El Paso has been using shielded light fixtures when replacing old ones for the past seven years .

This Eric Enders image of El Paso (foreground) and Ciudad Juárez, Mexico (background) shows the need of light pollution legislation in El Paso and other cities. http://www.ericenders.com/photo-ep.htm

Help turn off the lights...

Join the
International Dark-Sky Association (IDA)
http://www.darksky.org
"To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting."



Lunar and Planetary Institute's Family Space Days

Matt Hommel

The Lunar and Planetary Institute's February Family Space Day theme was the Earth. There were five stations set up with materials to research five questions concerning why earth is particularly suited to our species. The children made comparisons between Earth, Venus, and Mars.

Families also got to build terrariums. We built one Earth modeled terrarium and a Mars modeled terrarium with NASA simulated Martian soil. Then each child made an "Earth" book with pounds of glitter. This was followed by coloring until one child made a paper airplane. At this point several other children requested airplanes and the rest of the afternoon concentrated on aerodynamics and the forces of flight while we all played with paper airplanes.

Attendance was good, but there is always room for more. My thanks go out as usual to the good people at the Lunar Planetary Institute who provided this exceptional and **FREE** activity.

Till Next Month…

Upcoming Family Space Days

March 26	Seasons and the Sun/Earth Connection
April 16	Black Holes/Star Origins
May 21	Constellations
June 18	Galaxies Far, Far, Away
July 16	Deep Impact - Comets, Asteroids and Other Solar System Leftovers
August 20	Space Shuttle

Which Part of the Telescope Are You?

Becky Ramotowski

During my morning power thinking session in the shower, it occurred to me that astronomy clubs are kind of like telescopes. This analogy should come as no surprise once you think about it. And after you read this, you will rightly conclude that I stayed in the shower too long and look like an astronomical prune now.

We all might consider the primary mirror of a telescope to be the main part. That might be true. But the main mirror of a telescope, just like the leader of any astronomy club can not stand alone without the other parts. It could, but it would be lonely and sad. As you will soon see, all the other pieces, no matter how small are just as important as the primary.

The main mirror is not very useful without a secondary mirror. The secondary is not so hot without the primary. Neither is of much use without a tube to hold and align them. The tube is just a hollow nothing without the two mirrors inside.

None of the parts above are all that user friendly without a finder. A finder by itself can help locate celestial goodies, but what good is it if there's no way to look at the found treasure?

Then we have the mount for all of the above. A sturdy mount is essential. You must have a firm mount if you want to be successful in your nightly observations otherwise you will just wobble and shake and not get much done.

The optical tube assembly needs the mount to rest on; otherwise it will just sit around wishing it could observe something. The mount would also just sit around, unoccupied and bored collecting dust or hats without the tube assembly.

We all know that even the lowly counterweight is crucial to making a telescope work properly. Just try using a telescope without one.

And don't forget the eyepieces. They are just like the rest of the parts and pieces, and not very useful alone. It does seem like the more eyepieces there are, the better.

Then we have accessories. They are not vital, but they are essential. They make the whole viewing experience better. A red LED flashlight is pretty cool by itself, but it's much cooler when it's being used to look at a star chart. And speaking of star charts, you must have some way to navigate the sky. Or you can meander around lost in the voids of space for years.

In summary, this only means that all parts of a telescope are equally important, just like all the members of an astronomy club are.

If you think you are not a key part of your club, think again. Even a member just sitting and listening to an astronomy presentation is important. It takes all kinds of members to make a club complete. Some members like to participate and be a larger part of the scope, while others are like accessories and just want to help out in a smaller yet supportive way.

There's nothing wrong with being a red LED, or an eyepiece. (Personally I'm just a log book.)

All members are truly important and even the smallest amount of participation is a large factor in making the whole better.

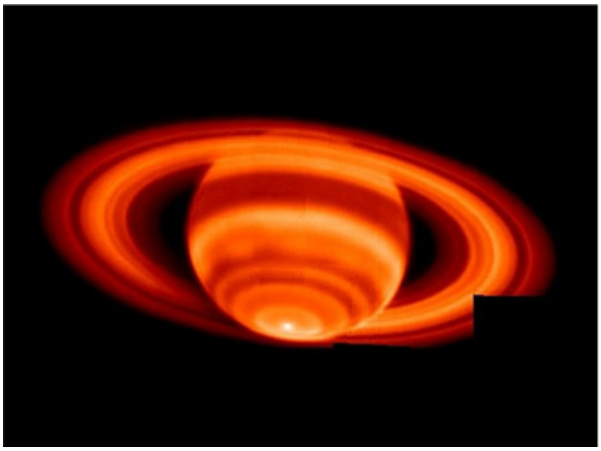
Which part of the scope are you?

Saturn's Bull's-Eye Marks Its Hot Spot

Press Release: 2005-020 : February 3, 2005

NASA astronomers using the Keck I telescope in Hawaii are learning much more about a strange, thermal "hot spot" on the tip of Saturn's south pole.

In the most precise reading of Saturn's temperatures ever taken from Earth, a new set of infrared images suggests a warm "polar vortex" at Saturn's south pole - the first warm polar cap ever to be discovered in the solar system. The vortex is punctuated by a compact spot that is the warmest place on the planet. The researchers report their findings in the Feb. 4 issue of the journal Science.



This is the sharpest image of Saturn's temperature emissions taken from the ground; it is a mosaic of 35 individual exposures made at the W.M. Keck I Observatory, Mauna Kea, Hawaii on Feb. 4, 2004.

The images to create this mosaic were taken with infrared radiation. The mosaic was taken at a wavelength near 17.65 microns and is sensitive to temperatures in Saturn's upper troposphere. The prominent hot spot at the bottom of the image is right at Saturn's south pole. The warming of the southern hemisphere was expected, as Saturn was just past southern summer solstice, but the abrupt changes in temperature with latitude were not expected. The tropospheric temperature increases toward the pole abruptly near 70 degrees latitude from 88 to 89 Kelvin (-301 to -299 degrees Fahrenheit) and then to 91 Kelvin (-296 degrees Fahrenheit) right at the pole.

Ring particles are not at a uniform temperature everywhere in their orbit around Saturn. The ring particles are orbiting clockwise in this image. Particles are coldest just after having cooled down in Saturn's shadow (lower left). As they orbit Saturn, the particles increase in temperature up to a maximum (lower right) just before passing behind Saturn again in shadow.

A small section of the ring image is missing because of incomplete mosaic coverage during the observing sequence.

Credit: NASA/JPL

A polar vortex is a persistent, large-scale weather pattern, likened to a jet stream on Earth in the upper atmosphere. On Earth, the Arctic Polar Vortex is typically located over eastern Canada and plunges arctic air to the northern plains in the United States. Earth's cold Antarctic Polar Vortex, centered over Antarctica, traps air and creates unusual chemistry, such as the effects that create the "ozone hole".

Polar vortices on Earth, Jupiter, Mars and Venus are colder than their surroundings. But new images from the W. M. Keck Observatory show the first evidence of such a polar vortex at much warmer temperatures than their surroundings. And the even warmer, compact region at the pole itself is quite unusual.

"There is nothing like this compact warm 'cap' in the Earth's atmosphere," said Dr. Glenn S. Orton, senior research scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif., and lead author of the paper. "Meteorologists have detected sudden warming of the pole, but on Earth this effect is very short-term. This phenomenon on Saturn is longer-lived because we've been seeing hints of it in our data for at least two years."

Data for these observations were taken in the imaging mode of the Keck facility instrument, the Long Wavelength Spectrometer, on Feb. 4, 2004, by Orton and Dr. Padma Yanamandra-Fisher, the paper's co-author, also a research scientist at JPL.

The puzzle isn't that Saturn's south pole is warm; after all, it has been exposed to 15 years of

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continuous sunlight, having just reached its summer Solstice late in 2002. But both the distinct boundary of a warm polar vortex some 30 degrees latitude from the southern pole and a very hot "tip" right at the pole were completely unexpected. If the increased southern temperatures are the result of the seasonal variations of sunlight, then temperatures should increase gradually with increasing latitude. But they don't – the tropospheric temperature increases toward the pole abruptly near 70 degrees latitude from 88 to 89 Kelvin (-301 to -299 degrees Fahrenheit) and then to 91 Kelvin (-296 degrees Fahrenheit) right at the pole. Near 70 degrees latitude, the stratospheric temperature increases even more abruptly from 146 to 150 Kelvin (-197 to -189 degrees Fahrenheit) and then again to 151 Kelvin (-188 degrees Fahrenheit) right at the pole.

The abrupt temperature changes may be caused by a concentration of sunlight-absorbing particulates trapping heat in Saturn's upper atmosphere. This theory would explain why the hot spot appears dark in visible light and contains the highest measured temperatures on Saturn. However, this alone would not explain why the particles themselves are constrained to a compact area at Saturn's south pole. One possible explanation would be downwelling of dry air, which is also consistent with deeper clouds observed at the southern pole. Researchers plan more observations to check that possibility.

More detail about the temperatures and possible chemical changes in these regions may be available from an infrared spectrometer on the Cassini spacecraft, in orbit around Saturn. The discovery of the hot spot at Saturn's south pole has prompted Cassini's composite infrared spectrometer science team, including Orton, to redirect some future observations to this area.

"One of the obvious questions is whether Saturn's north pole is abnormally cold and whether a cold polar vortex has been established there. That's something we can't see from Earth, and Cassini's instruments will be in a unique position to observe it," said Orton.

Funding for this research was provided by NASA's Office of Space Sciences and Applications, Planetary Astronomy Discipline, and the NASA Cassini project. The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington, D.C.

The W.M. Keck Observatory is operated by the California Association for Research in Astronomy, a non-profit scientific partnership of the California Institute of Technology, the University of California, and NASA. On the Web at http://www.keckobservatory.org.

Carolina Martinez (818) 354-9382
Jet Propulsion Laboratory, Pasadena, Calif.

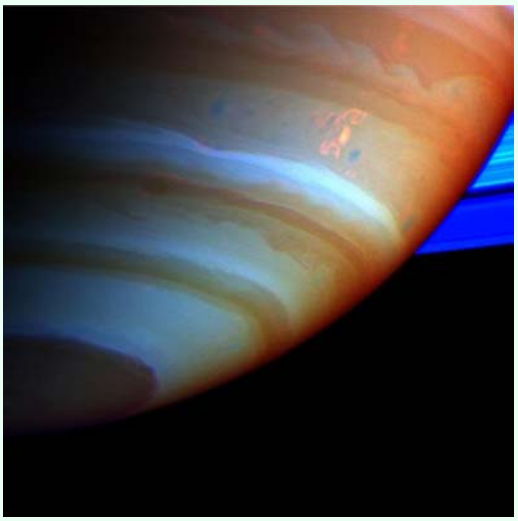
Laura K. Kraft (808) 885-7887
W. M. Keck Observatory, Mauna Kea, Hawaii

Member Recognition

Randy Brewer's Lunar Eclipse montage was printed in the March edition of *Astronomy* magazine (page 101). Randy also had an image of the Sombrero galaxy on page 65 in the same issue.

The Dragon Storm

February 24, 2005



A large, bright and complex convective storm that appeared in Saturn's southern hemisphere in mid-September 2004 was the key in solving a long-standing mystery about the ringed planet.

Saturn's atmosphere and its rings are shown here in a false color composite made from Cassini images taken in near infrared light through filters that sense different amounts of methane gas. Portions of the atmosphere with a large abundance of methane above the clouds are red, indicating clouds that are deep in the atmosphere. Grey indicates high clouds, and brown indicates clouds at intermediate altitudes. The rings are bright blue because there is no methane gas between the ring particles and the camera.

The complex feature with arms and secondary extensions just above and to the right of center is called the Dragon Storm. It lies in a region of the southern hemisphere referred to as "storm alley" by imaging scientists because of the high level of storm activity observed there by Cassini in the last year.

The Dragon Storm was a powerful source of radio emissions during July and September of 2004. The radio waves from the storm resemble the short bursts of static generated by lightning on Earth. Cassini detected the bursts only when the storm was rising over the horizon on the night side of the planet as seen from the spacecraft; the bursts stopped when the storm moved into sunlight. This on/off pattern repeated for many Saturn rotations over a period of several weeks, and it was the clock-like repeatability that indicated the storm and the radio bursts are related. Scientists have concluded that the Dragon Storm is a giant thunderstorm whose precipitation generates electricity as it does on Earth. The storm may be deriving its energy from Saturn's deep atmosphere.

One mystery is why the radio bursts start while the Dragon Storm is below the horizon on the night side and end when the storm is on the day side, still in full view of the Cassini spacecraft. A possible explanation is that the lightning source lies to the east of the visible cloud, perhaps because it is deeper where the currents are eastward relative to those at cloud top levels. If this were the case, the lightning source would come up over the night side horizon and would sink down below the day side horizon before the visible cloud. This would explain the timing of the visible storm relative to the radio bursts.

The Dragon Storm is of great interest for another reason. In examining images taken of Saturn's atmosphere over many months, imaging scientists found that the Dragon Storm arose in the same part of Saturn's atmosphere that had earlier produced large bright convective storms. In other words, the Dragon Storm appears to be a long-lived storm deep in the atmosphere that periodically flares up to produce dramatic bright white plumes which subside over time. One earlier sighting, in July 2004, was also associated with strong radio bursts. And another, observed in March 2004 and captured in a movie created from images of the atmosphere (http://photojournal.jpl.nasa.gov/catalog/PIA06082 and http://photojournal.jpl.nasa.gov/catalog/PIA06083) spawned three little dark oval storms that broke off from the arms of the main storm. Two of these subsequently merged with each other; the current to the north carried the third one off to the west, and Cassini lost track of it. Small dark storms like these generally get stretched out until they merge with the opposing currents

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to the north and south.

These little storms are the food that sustains the larger atmospheric features, including the larger ovals and the eastward and westward currents. If the little storms come from the giant thunderstorms, then together they form a food chain that harvests the energy of the deep atmosphere and helps maintain the powerful currents.

Cassini has many more chances to observe future flare-ups of the Dragon Storm, and others like it over the course of the mission. It is likely that scientists will come to solve the mystery of the radio bursts and observe storm creation and merging in the next 2 or 3 years.

For more information about the Cassini-Huygens mission visit http://saturn.jpl.nasa.gov . For images visit the Cassini imaging team home page http://ciclops.org.

Credit: NASA/JPL/Space Science Institute

Sky & Telescope and now Astronomy Magazine Subscriptions – Don't Forget about the Club Discount!

Sky & Telescope offers a "Club Discount" on subscriptions. You can subscribe to Sky and Telescope for $10 off the normal price ($32.95 with the club discount). Astronomy magazine is also offering a club discount. JSCAS members can subscribe to Astronomy for $29 a year. We need to have a minimum of five subscribers to take advantage of the discount. I need **four** more people to sign up. If you are a current subscriber, *please* contact me so I can put you on the list for the club discount when your subscription is due for renewal!

Contact me by the email listed on the JSCAS web site, catch me at a meeting, or send your check and renewal form to my home address: 2407 Elkton Ct., Pearland, TX, 77584. I'll put your renewal in the mail within 48 hours after I receive it.

David Haviland
Vice-president and Secretary

For Sale

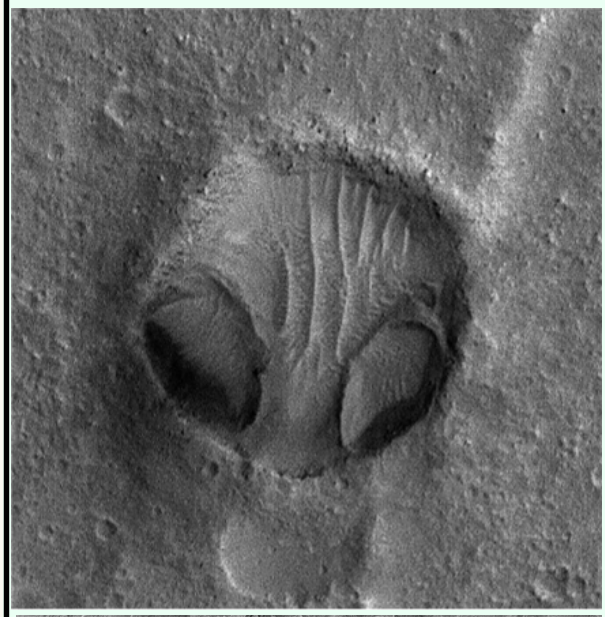
I am selling my NJP mount since I am exclusively using my larger EM-500 mount now. Please contact Randy Brewer if you are interested. I would much prefer to sell it locally rather than have to ship it.

It is built like a tank and tracks at 4 arc seconds accuracy. It is conservatively rated at 65 pounds load and operates on either 12 or 24 volts DC. It is compatible with most planetarium software for full GOTO capabilities. The new list price is $7,555 for the mount and $655 for the mahogany tripod. I have additional counter weights and accessories that can go with it if needed.

This is a very portable mount that is SUPERB for CCD imaging

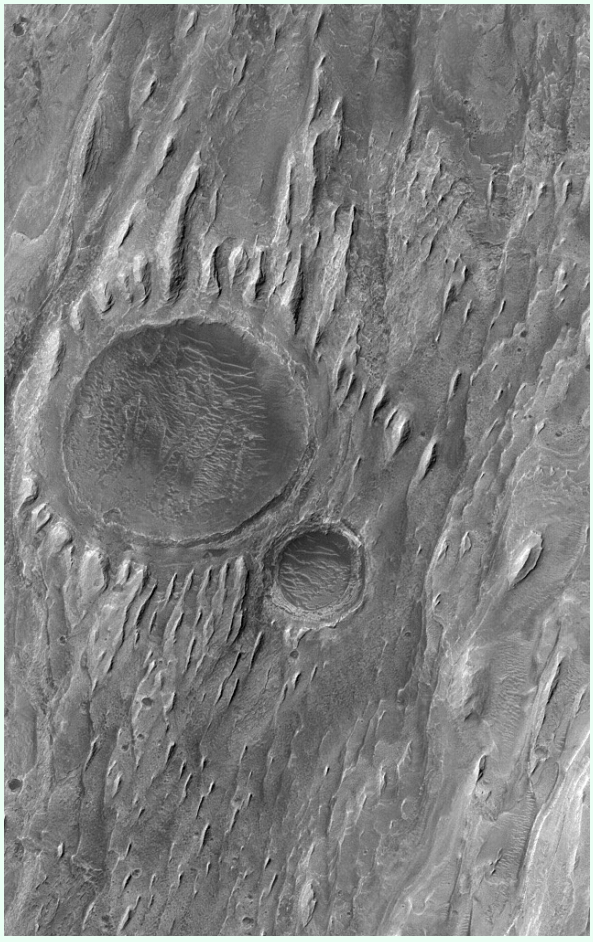
Randy Brewer

Mars Global Surveyor Images



Chryse "Alien Head"
MGS MOC Release No. MOC2-983,
26 January 2005
NASA/JPL/Malin Space Science Systems

This Mars Global Surveyor (MGS) Mars Orbiter Camera (MOC) image shows an impact crater in Chryse Planitia, not too far from the Viking 1 lander site, that seems to resemble a bug-eyed head. The two odd depressions at the north end of the crater (the "eyes") may have formed by wind or water erosion. This region has been modified by both processes, with water action occurring in the distant past via floods that poured across western Chryse Planitia from Maja Valles, and wind action, a common occurrence in more recent history. This crater is located near 22.5°N, 47.9°W. Sunlight illuminates the scene from the left/lower left.



MOC 1000th Release!
MGS MOC Release No. MOC2-1000,
12 February 2005
NASA/JPL/Malin Space Science Systems

This Mars Global Surveyor (MGS) Mars Orbiter Camera (MOC) image shows the remains of two impact craters that were filled, buried, and then exhumed from within layered sedimentary rock in the Martian crater, Gale. Wind erosion has sculpted tapered yardang ridges in the uppermost rock layers exposed at this location.

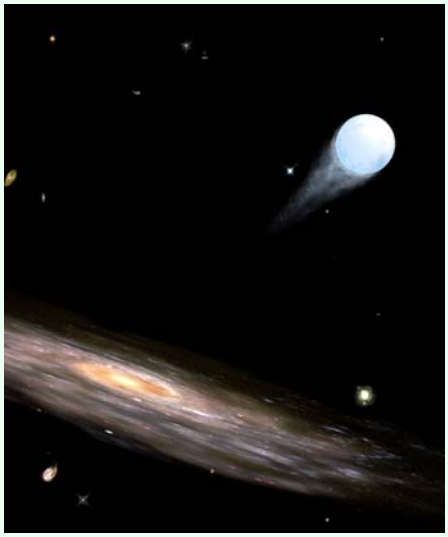
This is the 1000th captioned image release from the MGS MOC team. The first release occurred in July 1997, when the spacecraft was still speeding toward the red planet.

Many people have asked "why are the releases numbered starting with 'MOC2'?" The MGS MOC is the second MOC, so it is designated "MOC2". The first MOC was flown on the Mars Observer spacecraft, which was lost just before arrival at Mars in August 1993. The MOC science investigation was originally selected by NASA in 1986. The MGS MOC effort is currently in its third extended mission, and is funded through at least October 2006.

First Stellar Outcast Discovered by Astronomers

Release No.: 05-05, February 8, 2005
Harvard-Smithsonian Center for Astrophysics

Cambridge, MA--Using the MMT Observatory in Tucson, AZ, astronomers at the Harvard-Smithsonian Center for Astrophysics (CfA) are the first to report the discovery of a star leaving our galaxy, speeding along at over 1.5 million miles per hour. This incredible speed likely resulted from a close encounter with the Milky Way's central black hole, which flung the star outward like a stone from a slingshot. So strong was the event that the speedy star eventually will be lost altogether, traveling alone in the blackness of intergalactic space.



Artist rendition of ejected star by Ruth Bazinet, CfA.

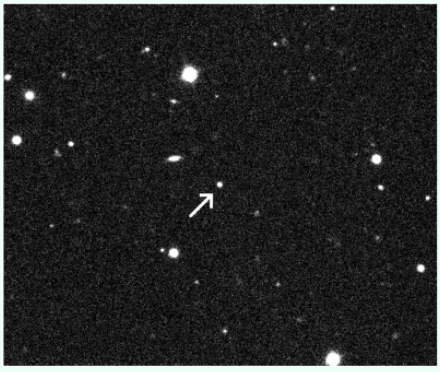
"We have never before seen a star moving fast enough to completely escape the confines of our galaxy," said co-discoverer Warren Brown (CfA). "We're tempted to call it the outcast star because it was forcefully tossed from its home."

The star, catalogued as SDSS J090745.0+24507, once had a companion star. However, a close pass by the supermassive black hole at the galaxy's center trapped the companion into orbit while the speedster was violently flung out. Astronomer Jack Hills proposed this scenario in 1998, and the discovery of the first expelled star seems to confirm it.

"Only the powerful gravity of a very massive black hole could propel a star with enough force to exit our galaxy," explained Brown.

While the star's speed offers one clue to its origin, its path offers another. By measuring its line-of-sight velocity, it suggests that the star is moving almost directly away from the galactic center. "It's like standing curbside watching a baseball fly out of the park," said Brown.

The outcast star is marked by the arrow. The outcast star is leaving the Milky Way forever, and is already in the distant outskirts of the Galaxy. The image comes from the Sloan Digitial Sky Survey and shows an area of sky 1/50th the size of the full Moon. Credit: SDSS Collaboration (www.sdss.org)



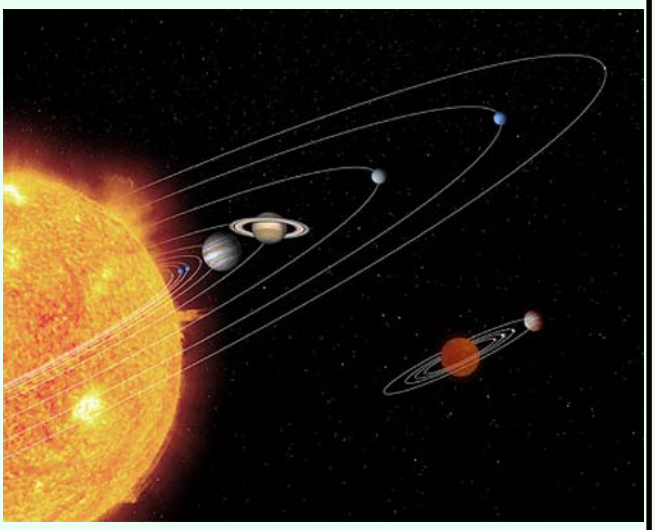
Its composition and age provide additional proof of the star's history. The fastest star contains many elements heavier than hydrogen and helium, which astronomers collectively call metals. "Because this is a metal-rich star, we believe that it recently came from a star-forming region like that in the galactic center," said Brown. Less than 80 million years were needed for the star to reach its current location, which is consistent with its estimated age.

The star is traveling twice as fast as galactic escape velocity, meaning that the Milky Way's gravity will not be able to hold onto it. Like a space probe launched from Earth, this star was launched from the galactic center onto a never-ending outward journey. It faces a lonely future as it leaves our galaxy, never to return.

Brown's co-authors on the paper announcing this find are Margaret J. Geller, Scott J. Kenyon and Michael J. Kurtz (Smithsonian Astrophysical Observatory). This study will be published in an upcoming issue of The Astrophysical Journal.

'Mini-Me' Solar System

Credit: NASA/JPL-Caltech/T. Pyle (SSC)



This artist's conception shows the relative size of a hypothetical brown dwarf-planetary system (below) compared to our own solar system.

A brown dwarf is a cool or "failed" star, which lacks the mass to ignite and shine like our Sun. NASA's Spitzer Space Telescope set its infrared eyes on an extraordinarily low-mass brown dwarf called OTS 44 and found a swirling disk of planet-building dust. At only 15 times the mass of Jupiter, OTS 44 is the smallest known brown dwarf to host a planet-forming, or protoplanetary, disk.

Astronomers believe that this unusual system will eventually spawn planets. If so, they speculate that OTS 44's disk has enough mass to make one small gas giant and a few Earth-sized rocky planets.

Examples of these possible planets are depicted at the bottom of this picture, circling a low-mass brown dwarf. Above, the bodies of our own solar system have been drawn to the same scale. In each system, the terrestrial planets have been enlarged and the distances between the planets and their parent bodies have been scaled down for easier viewing.

Need More Astronomy?

Other Houston Area Astronomy Clubs

Brazosport Astronomy Club
Meets the Third Tuesday of the month, 7:45 p.m.
At the Planetarium
400 College Drive
Clute, Texas
For more information, contact Judi James at the Planetarium
979-265-3376

Fort Bend Astronomy Club http://www.fbac.org/
Meets the third Friday of the month, 7:00 p.m.
First Colony Conference Center
3232 Austin Pkwy
Sugar Land, Texas

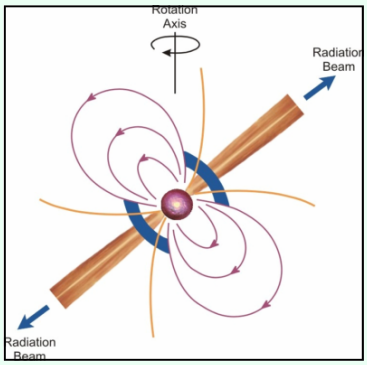
Houston Astronomical Society http://spacibm.rice.edu/~has/
Meets the first Friday of the month, 8:00 p.m.
University of Houston, University Park
Science and Research Building, room 117

North Houston Astronomy Club http://www.astronomyclub.org/
Meets the fourth Friday of the month, 7:30 p.m.
In the Teaching Theater at Kingwood College
20000 Kingwood Drive
Kingwood, Texas

Star Cluster Buzzing With Pulsars

National Radio Astronomy Observatory
For Release: 9:30 a.m., PST, Wednesday, January 12, 2005

A dense globular star cluster near the center of our Milky Way Galaxy holds a buzzing beehive of rapidly-spinning millisecond pulsars, according to astronomers who discovered 21 new pulsars in the cluster using the National Science Foundation's 100-meter Robert C. Byrd Green Bank Telescope (GBT) in West Virginia. The cluster, called Terzan 5, now holds the record for pulsars, with 24, including three known before the GBT observations.



Pulsar Diagram

"We hit the jackpot when we looked at this cluster," said Scott Ransom, an astronomer at the National Radio Astronomy Observatory in Charlottesville, VA. "Not only does this cluster have a lot of pulsars -- and we still expect to find more in it -- but the pulsars in it are very interesting. They include at least 13 in binary systems, two of which are eclipsing, and the four fastest-rotating pulsars known in any globular cluster, with the fastest two rotating nearly 600 times per second, roughly as fast as a household blender," Ransom added. Ransom and his colleagues reported their findings to the American Astronomical Society's meeting in San Diego, CA, and in the online journal Science Express.

The star cluster's numerous pulsars are expected to yield a bonanza of new information about not only the pulsars themselves, but also about the dense stellar environment in which they reside and probably even about nuclear physics, according to the scientists. For example, preliminary measurements indicate that two of the pulsars are more massive than some theoretical models would allow. "All these exotic pulsars will keep us busy for years to come," said Jason Hessels, a Ph.D student at McGill University in Montreal.

Globular clusters are dense agglomerations of up to millions of stars, all of which formed at about the same time. Pulsars are spinning, superdense neutron stars that whirl "lighthouse beams" of radio waves or light around as they spin. A neutron star is what is left after a massive star explodes as a supernova at the end of its life.

The pulsars in Terzan 5 are the product of a complex history. The stars in the cluster formed about 10 billion years ago, the astronomers say. Some of the most massive stars in the cluster exploded and left the neutron stars as their remnants after only a few million years. Normally, these neutron stars would no longer be seen as swiftly-rotating pulsars: their spin would have slowed because of the "drag" of their intense magnetic fields until the "lighthouse" effect is no longer observable.


The Robert C. Byrd Green Bank Telescope
CREDIT: NRAO/AUI/NSF

However, the dense concentration of stars in the cluster gave new life to the pulsars. In the core of a globular cluster, as many as a million stars may be packed into a volume that would fit easily between the Sun and our nearest neighbor star. In such close quarters, stars can pass near enough to form new binary pairs, split

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apart such pairs, and binary systems even can trade partners, like an elaborate cosmic square dance. When a neutron star pairs up with a "normal" companion star, its strong gravitational pull can draw material off the companion onto the neutron star. This also transfers some of the companion's spin, or angular momentum, to the neutron star, thereby "recycling" the neutron star into a rapidly-rotating millisecond pulsar. In Terzan 5, all the pulsars discovered are rotating rapidly as a result of this process.

Astronomers previously had discovered three pulsars in Terzan 5, some 28,000 light-years distant in the constellation Sagittarius, but suspected there were more. On July 17, 2004, Ransom and his colleagues used the GBT, and, in a 6-hour observation, found 14 new pulsars, the most ever found in a single observation.

"This was possible because of the great sensitivity of the GBT and the new capabilities of our backend processor," said Ingrid Stairs, a professor at the University of British Columbia in Vancouver. The processor, named, appropriately, the Pulsar Spigot, was built in a collaboration between the NRAO and the California Institute of Technology. The processor, which generates almost 100 GigaBytes of data per hour, allowed the astronomers to gather and analyze radio waves over a wide range of frequencies (1650-2250 MegaHertz), adding to the sensitivity of their system.

Eight more observations between July and November of 2004 discovered seven additional pulsars in Terzan 5. In addition, the astronomers' data show evidence for several more pulsars that still need to be confirmed.

Future studies of the pulsars in Terzan 5 will help scientists understand the nature of the cluster and the complex interactions of the stars at its dense core. Also, several of the pulsars offer a rich yield of new scientific information. The scientists suspect that one pulsar, which shows strange eclipses of its radio emission, has recently traded its original binary companion for another, and two others have white-dwarf companions that they believe may have been produced by the collision of a neutron star and a red-giant star. Subtle effects seen in these two systems can be explained by Einstein's general relativistic theory of gravity, and indicate that the neutron stars are more massive than some theories allow. The material in a neutron star is as dense as that in an atomic nucleus, so that fact has implications for nuclear physics as well as astrophysics.

"Finding all these pulsars has been extremely exciting, but the excitement really has just begun," Ransom said. "Now we can start to use them as a rich and valuable cosmic laboratory," he added.

In addition to Ransom, Hessels and Stairs, the research team included Paulo Freire of Arecibo Observatory in Puerto Rico, Fernando Camilo of Columbia University, Victoria Kaspi of McGill University, and David Kaplan of the Massachusetts Institute of Technology.

The National Radio Astronomy Observatory is a facility of the National Science Foundation, operated under cooperative agreement by Associated Universities, Inc. The pulsar research also was supported by the Canada Foundation for Innovation, Science and Engineering Research Canada, the Quebec Foundation for Research on Nature and Technology, the Canadian Institute for Advanced Research, Canada Research Chairs Program, and the National Science Foundation.

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Upcoming Events

Fort McKavett Star Party
And March JSCAS Meeting

The Spring Fort McKavett Star Party will be held between March 3rd and March 6th at the Fort McKavett State Historical Site.

A group of JSCAS members will travel to Junction Elementary School on Friday afternoon to make presentations to the students. We plan to leave early enough to have a nice lunch in Junction.

Friday night we will once again do our traditional, "Bring Your Own" cookout. Two large fire pits will be available to grill the steaks, chickens, or burgers that you bring for yourself. Bring an extra side dish or dessert to share with your neighbors.

At noon on Saturday, the Friends of Fort McKavett will be hosting a wonderful BBQ feast for us. If you are new to the Fort McKavett star parties, you won't walk away hungry after this BBQ. A donation to the Friends group of $10 per person is suggested to help pay for the food. All money donated to the Friends will be used in direct support of the fort and this event.

The March meeting of JSCAS will be at the Fort McKavett school house on Saturday after the BBQ. We will take a group picture and have an informal social gathering.

On Saturday evening, there will be a public star party. The Friends will be serving food at the Park Headquarters (Post Hospital) just before the star party.

The fort's electrical problems have not yet been resolved. Randy Brewer will be bringing a spare generator and Buddy has a couple of generator's that can be used to supply some power for our use. If we need to allocate the electricity, we will ensure that it is available for anyone needing to run medical equipment first then telescopes, CCD equipment and laptops.

Texas weather is most unpredictable. Be prepared to dress warmly and bring plenty of blankets in case the temperature drops. Contact Lisa Lester by Wednesday evening (March 2nd) at 281-479-1102 if you plan to attend.

Third High Energy Astrophysics Workshop

You are all invited to the 3rd High Energy Astrophysics Workshop for Amateur Astronomers.

When: March 21-23, 2005
Where: New Mexico State University, Las Cruces, NM
Who: Sponsored by the AAVSO, NMSU, NASA Marshall Space Flight Center, and Sonoma State University through the NASA SWIFT and GLAST missions.

The goal of this meaning is to educate the public on topics in high energy astrophysics. The focus will be on GRBs, magnetars, magnetic cataclysmic variables ("polars") and blazars. This is a great

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meeting for amateur astronomers, teachers, students and graduate students.

A lineup of high energy all-stars is speaking, such as Jerry Fishman, Lynn Cominsky, Arne Henden and Phil Plait (author of www.badastronomy.com).

Workshops will be held on high precision CCD photometry, education and public outreach and an introduction to data analysis using free Windows software tools.

A day-long field trip to the VLA is also planned (with a special tour for us, not the regular public tour!).

Travel grants of $450 and $800 are available to residents of the U.S. and an application form is already online. Recipients of the travel grants are expected to share what they've learned with their local community upon return. How this is done can be creative (including online methods). Information is here! If you have any questions feel free to contact meetings@aavso.org.

Clear skies!
Aaron Price

Texas Star Party

I have almost finalized my invited guest speaker lineup for this year's TSP, and I am very excited to announce that after quite a bit of negotiations, Dr. Halton Arp will attend. He will be at TSP for a very brief time. Due to time constraints, Dr. Arp will only be attending from Monday evening until Thursday morning. He is looking forward to answering questions and visiting with amateurs on Wednesday, after his Tuesday evening talk.

He will be speaking on Tuesday evening at 7:30 p.m. Dr. Arp is 77 years old and was a student of Edwin Hubble (Hubble Space Telescope namesake). He was my special guest at TSP in 1995. This is the 10th anniversary of his previous visit. The A.L. Arp Peculiar Galaxy observing club was inspired by this rare (and his only other amateur astronomy conference) visit.

Sincerely,
Barbara Wilson
TSP Invited Speaker Chairperson

Tuesday May 3rd- Dr. Halton Arp (Max-Planck-Institut für Astrophysik in Germany) (confirmed)

Halton C. Arp received his Bachelors degree from Harvard College in 1949 and his Ph.D. from California Institute of Technology in 1953, both cum laude. He is a professional astronomer who, earlier in his career, conducted Edwin Hubble's nova search in M31. He has earned the Helen B.Warner prize, the Newcomb Cleveland award and the Alexander von Humboldt Senior Scientist Award. For 28 years he was staff astronomer at the Mt.Palomar and Mt. Wilson observatories. While there, he produced his well known catalog of "Peculiar Galaxies" that are disturbed or irregular in appearance.

Wednesday May 4th Robert T. Mitchell, Project Manager Cassini Mission to Saturn (confirmed).

Bob Mitchell will talk about the mission to Saturn. Here is a link to pictures of Bob Mitchell and an interview: http://www.planetary.org/news/2004/conversation_mitchell-bob_cassini_0811.html.

Since joining JPL in 1965, Mitchell has worked on spacecraft trajectory design, mission design, and navigation for such planetary exploration projects as Mariner '67, Mariner '69,

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Mariner '71, the Viking Mission to Mars, and Galileo.

Before becoming Galileo project manager, Mitchell was Galileo mission director, and prior to that, Galileo mission design manager from 1979 to 1988. From 1988 to 1993, Mitchell managed JPL's overall Mission Design Section, and from 1993 through 1996, he managed the Galileo Science and Sequence Office. He has been project Manager of Cassini since June of 1998.

Thursday May 5th Dr. Brent Archinal (still tentative)

Friday May 6th Stephanie McLaughlin, Small Telescope Science Project coordinator for NASA's Deep Impact Mission Deep Impact Mission. (confirmed)

She will speak about the NASA Deep Impact Mission's Small Telescope Science Program and the upcoming 0600 4 July 2005 UT impact into the nucleus of Comet Temple 1. Stephanie will talk about he work of amateur astronomers who have and continue to contribute to the NASA mission, and how amateurs can continue to contribute to its success.

Stephanie is a Faculty Research Assistant at the Department of Astronomy, University of Maryland College Park, MD 20742-2421. The Deep Impact Mission will explore the deep regions of the nucleus of comet Tempel 1 before, during, and after impacts, and return the observations to Earth. For more information visit: http://deepimpact.umd.edu/stsp/ and http://www.astro.umd.edu/~stefmcl/

Saturday May 7th David J. Eicher , Managing Editor, Astronomy Magazine

David has previously spoken at two Texas Star Parties, in 1983 "Observing Active Galaxies", and in 1989 "The Universe From Your Backyard". In 1987 he received the Texas Star Party's Lone Stargazer award.

He is Editor of Astronomy Magazine (http://www.astronomy.com/) and author of numerous books on astronomy for deep sky observers .

Rocky Mountain Star Stare

The Rocky Mountain Star Stare (RMSS) will be held this year between July 7th and the 10th. The Colorado Springs Astronomical Society, host for RMSS, has a working relationship with the Pike National Forest to hold RMSS in different locations each year northwest of Lake George, Colorado. This year's location is known to the club as Tarryall Meadows which is our favorite site for summer star gazing!

Registration will be available very soon on our website. New this year: we are accepting payment thru Paypal! However, you may continue to register by printing and mailing the application as in previous years.

The RMSS is a unique experience, combining a rustic camping experience with wonderful dark skies. We are one of the lowest priced Star Parties in the nation! Plan now to attend. For more information, visit our website, at http://www.rmss.org.

If you have further questions, feel free to email me (skyguy@compdyna.com)!

Al Schlafli
President, Colorado Springs Astronomical Society

MEMBER'S GALLERY

NGC 7293
Helix Nebula
©Al Kelly

L/RGB image of the Helix nebula (NGC 7293) in Aquarius, made from images taken by Al Kelly with a Starlight Express MX916 and a C8 @ f5 on 10/3/02 and 10/6/02 from Johnson City, Texas. Nine 600-second unfiltered sub-exposures, two 600-second sub-exposures in red, two 600-second sub-exposures in green, and two 600-second sub-exposures in blue were acquired in Astroart and processed in AIP4WIN.

NGC 6992 — Veil Nebula
©Al Kelly

L/RGB image of a portion of the NGC 6992 section of the Veil Nebula in Cygnus, made from images taken by Al Kelly on 10/18/01 with a Starlight Express MX916 and a 17.5" f4.5 Newtonian from Johnson City, Texas. Seven 240-second high-resolution unfiltered sub-exposures, two 240-second low-resolution sub-exposures in red, two 240-second low-resolution sub-exposures in green, and two 240-second low-resolution sub-exposures in blue were acquired in Astroart and processed in AIP4WIN.

NGC 7635 — Bubble Nebula
Al Kelly

L/RGB color composite of NGC 7635, the Bubble nebula. Made by Al Kelly from images digitized from red, blue, and green-sensitive photographic plates provided to the public by the Palomar Observatory Sky Survey (POSS). Processed in AIP4WIN and Photoshop.

Visual Observing
March 2005

Chris Randall

★**SSO**: (Solar System Objects) Summary for the 15 March 2005

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	Psc	-26.7	100	06:30	12:29	18:26
Moon	Tau	----	34	09:43	16:54	00:00
Mercury	Psc	0.4	31	07:11	13:30	19:53
Venus	Aqr	-3.9	100	06:27	12:19	18:14
Mars	Sgr	1.1	91	03:32	08:42	13:52
Jupiter	Vir	-2.4	100	20:00	01:50	07:40
Saturn	Gem	0.5	100	13:19	20:17	03:12
Uranus	Aqr	5.9	100	05:45	11:26	17:06
Neptune	Cap	8.0	100	04:38	10:03	15:27
Pluto	Ser	13.9	99	00:58	06:25	11:51
2004 Q2 Machholz	Cam	6.9	86	-----	21:50	-----
2003 T4 Linear	Aqr	6.4	85	03:44	09:51	15:59

★**BSO**: (Bright Sky Objects)

IC2391 (C-85, Cr191, Omicron Vel Cluster) – Open Cluster in Vela, Magnitude 2.6, Size 9', Stars 30.
IC 2395 (Cr 192) – Open Cluster in Vela, Magnitude 4.6, Size 7', Stars 40.
NGC 2547 (Cr 177) – Open Cluster in Vela, Magnitude 4.7, Size 20', Stars 80.
NGC 2571 (Cr 181) – Open Cluster in Puppis, Magnitude 7.0, Size 13', Stars 30.

★**DSO**: (Dark Sky Objects)

M 81– Galaxy in UMa, Magnitude 7.9, Size 27' x 14'.
M 82– Galaxy in UMa, Magnitude 9.3, Size 11' x 4.2'.
NGC 2903– Galaxy in Leo, Magnitude 9.7, Size 12.6' x 6.0'.
NGC 2659– Open Cluster in Vela, Magnitude 8.6, Size 2.7', Stars 80.

★**CDMP:** (Chris' Don't Miss Pick)

NGC 2997 - 10.1 Magnitude almost face on spiral Galaxy, Size 9.2' x 7.4'

NGC 2997 is a grand design spiral galaxy. Its small nucleus and sprawling spiral arms give it a type "Sc" designation. It is speeding away from us at about 1100 kilometers per second, which would place it at about 55 million light years distant, given current estimates of the expansion rate of our universe. NGC 2997 is thought to have a mass of about 100 billion times that of our Sun, but is probably less massive than our own Milky Way Galaxy. NGC 2997 is not seen face-on - it is thought to be tilted by about 45 degrees. The galaxy's inclination reveals its internal structure and giving the it an oval appearance. Seen face-on,

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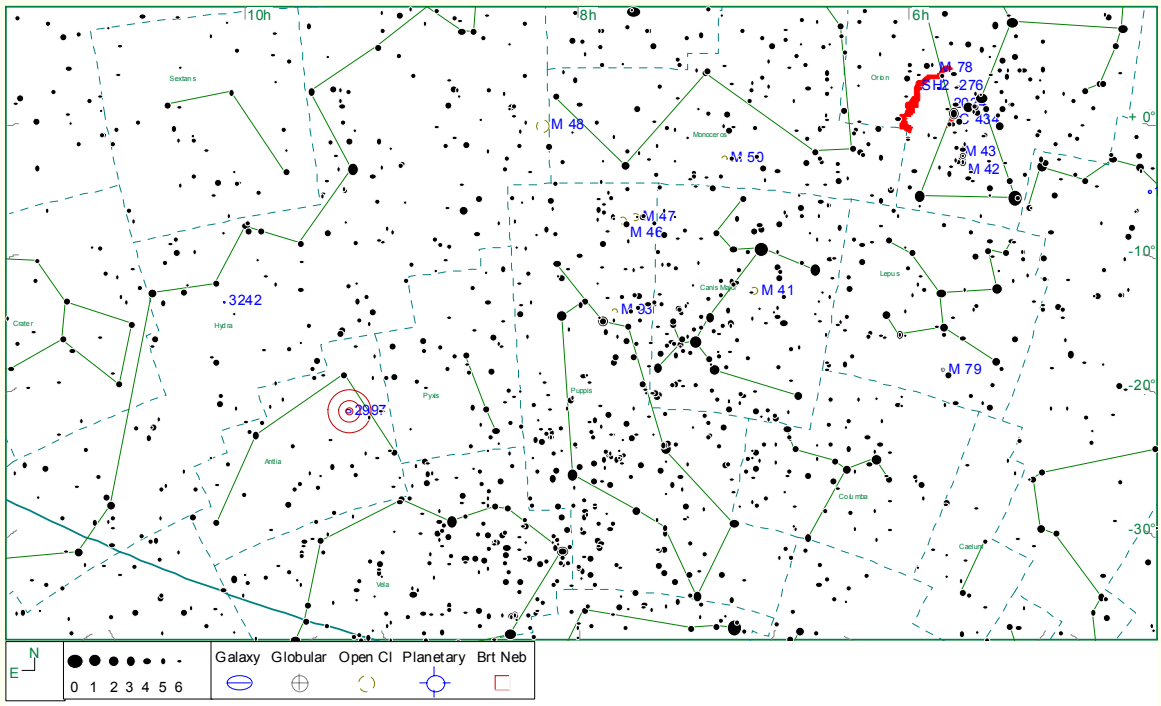
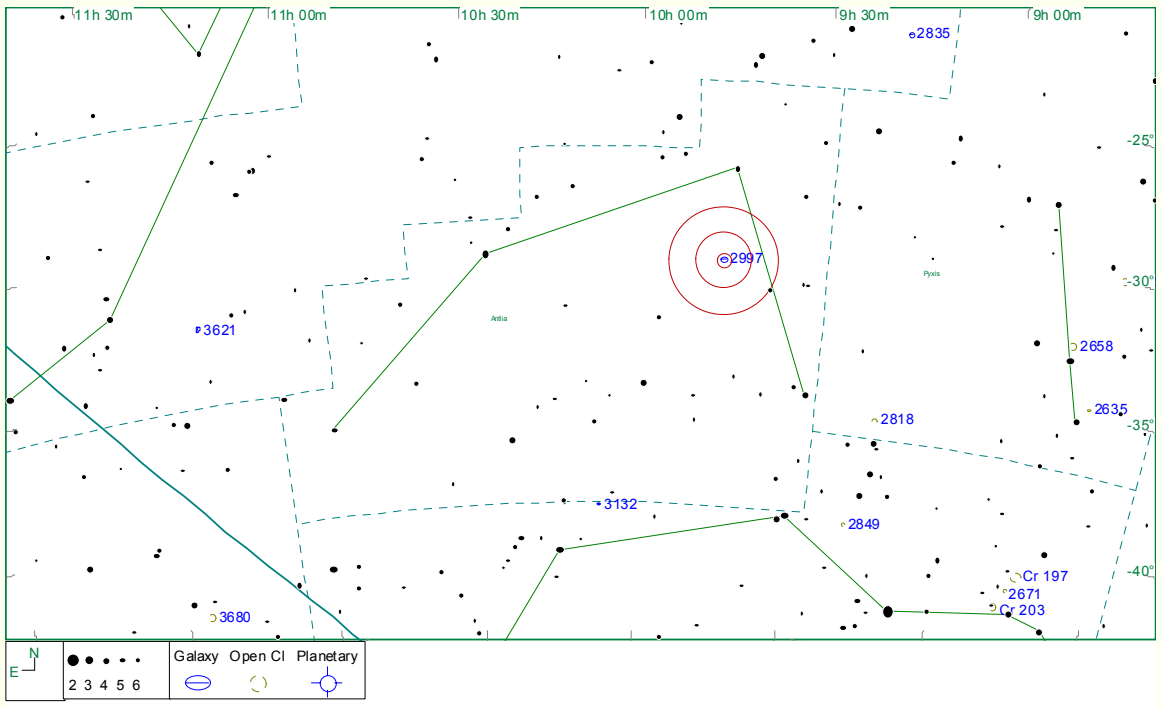
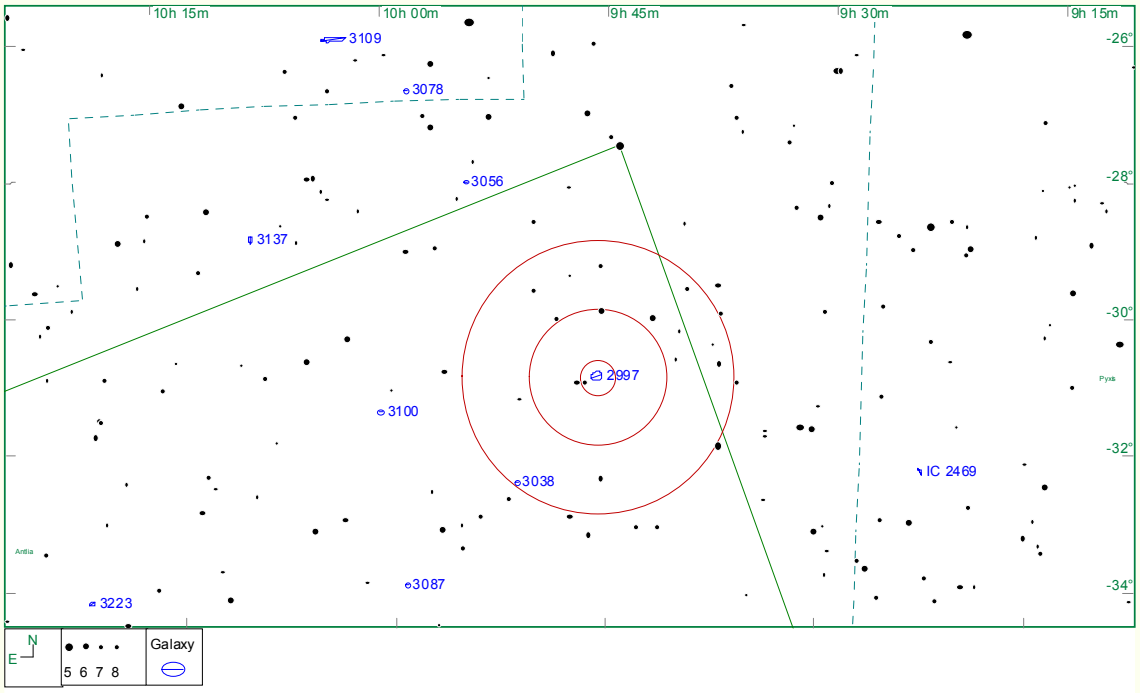
NGC 2997 would look rather like Messier 83. Like most spirals, the galaxy has two prominent spiral arms, which appear to originate in the yellow nucleus, are peppered with bright red blobs of ionized hydrogen, which are similar to regions of star formation in our own Milky Way. Within these gas clouds are produced the hot blue stars which generate most of the light in the arms of the galaxy. A much older population of yellowish stars are concentrated around the nucleus.



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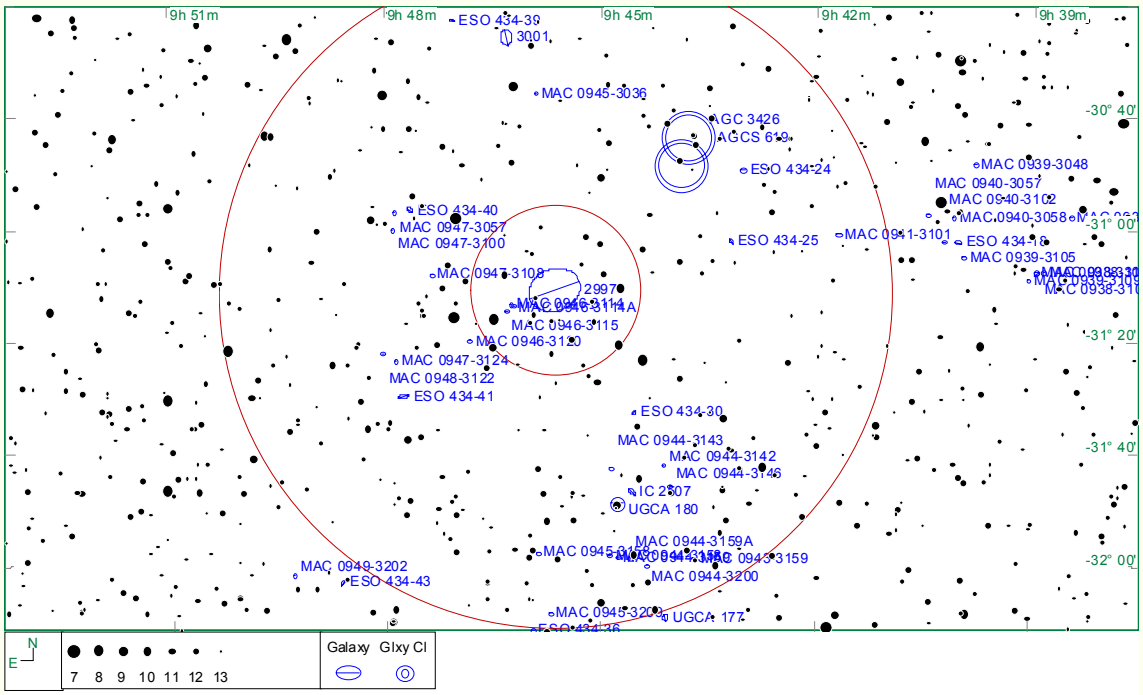
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March Meeting Agenda

Our March meeting will be held in conjunction with the Spring Fort McKavett Star Party, on Saturday, March 5th. The meeting will follow the noon Bar-B-Que. We will take a group picture and have an informal social gathering.

Fort McKavett is located about 6.5 hours west of the greater Houston area, 28 miles north of I-10 at Junction, Texas. For more information about the star party and directions to the fort visit: http://www.riverofstars.net/JSCAS/StarParties/FtMcKavett/FtMcKavettStarParty.htm.

Starscan Submission Procedures

Original articles of astronomical interest will be accepted up to 6 P.M. March 25th.

The most convenient way to submit articles or a Calendar of Events is by electronic mail, however computer diskettes or CDs will also be accepted. All articles should include author's name and phone number. Also include any picture credits. The recommended format is Microsoft Word. Text files will also be accepted.

Submitter bears all responsibility for the publishing of any e-mail addresses in the article on the World Wide Web.

Editor's electronic address is: lesteke@swbell.net. Be sure to include the word Starscan in the subject line for proper routing of your message.

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Cover Image
Iapetus
NASA/JPL/Space Science Institute

Cassini acquired the images in this mosaic of Saturn's intriguing moon Iapetus with its narrow angle camera on Dec. 31, 2004, at a distance of about 172,400 kilometers (107,124 miles) at a Sun-Iapetus-spacecraft, or phase, angle of 50 degrees.