STARSCAN

Johnson Space Center Astronomical Society

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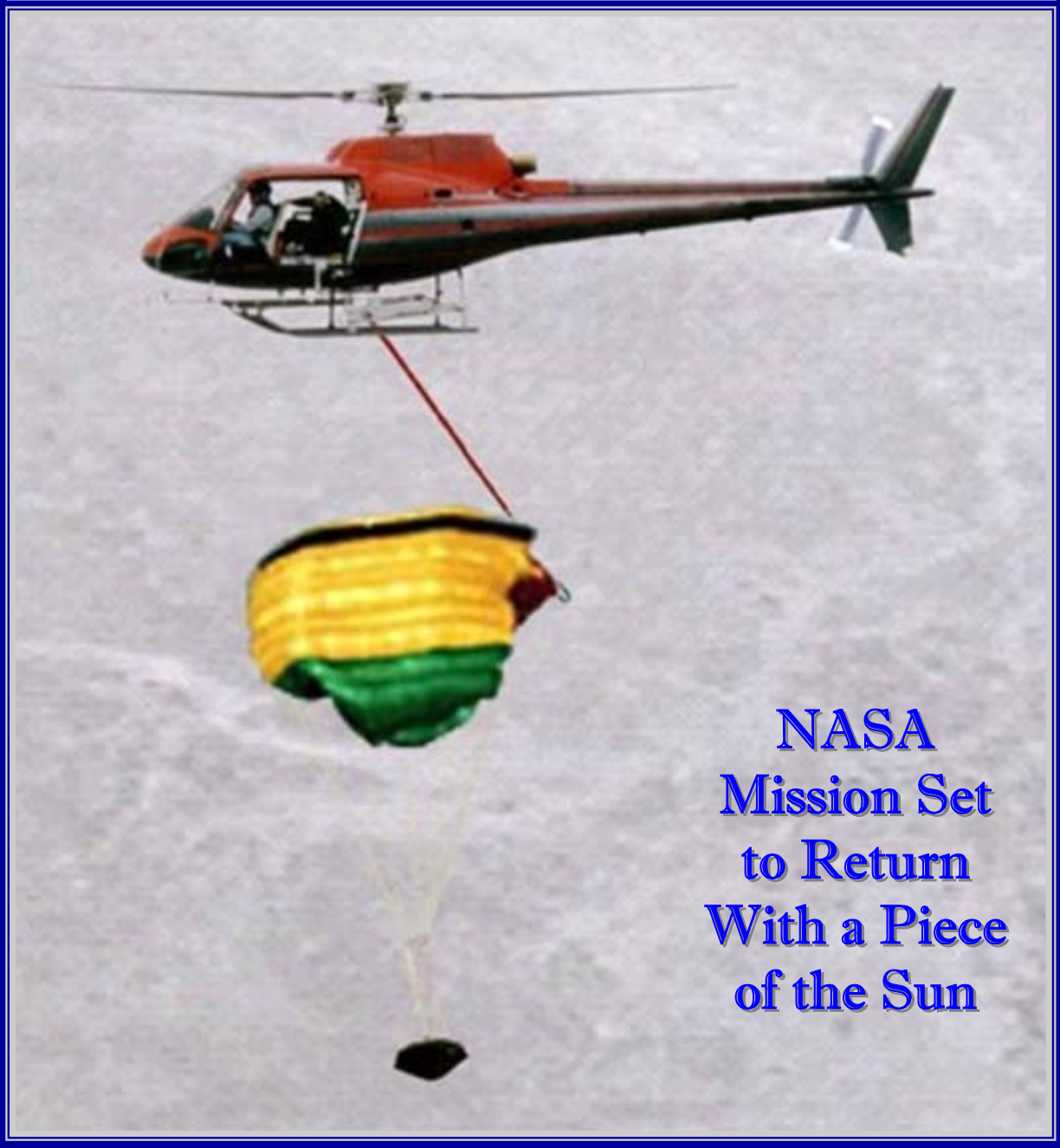

NASA Mission Set to Return With a Piece of the Sun

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Lisa Lester

We did not have any star parties in August but we do have one to look forward to in September. Please make sure that Saturday, September 18th is marked on your calendar. The star party will be at Challenger 7 Park. Meet at the park about 30 minutes before sunset. We will have electricity as always. Hopefully we will also have beautiful weather as we had to cancel the last star party there! A "go/no go" notification will be put out on the list server and on our star party web page at: http://www.riverofstars.net/JSCAS/StarParties/starparty.htm around 5 pm on the 18th.

In October, it will be time for our semiannual trip to Fort McKavett. The Fort McKavett Star Party event begins on Thursday, October 7th and ends Sunday, October 10th. As some of you are aware, Fort McKavett is having electrical problems. The underground lines were installed about 30 years ago and one section of the power grid has given out. Currently, they have rented a big generator so they have phone, a/c, and the use of the computers in the office area and the gift shop. Buddy's house and the shop area were not affected and the electricity in the barracks is currently working. Early this week, Buddy thought that the work of digging trenches and laying new lines would be starting soon and completed by the beginning of October. Yesterday, August 24th, he received an email from the engineer that the final written plans wouldn't be ready until mid-September as they are looking at the cost of boring horizontally as an alternative.

We are NOT canceling this event and we are NOT canceling the public star party. We do not know yet if the construction will be underway while we are there. If it is, we will work around it. If they have to turn off the electricity at the barracks, they have two emergency generators that we can use for the field. If construction is already underway at the time of our star party, we will need to provide a safe path for the public to the observing field. Our current plan is to use red Christmas lights to mark the way. If lights are needed, I will post a message on the list server shortly before the event asking for volunteers to loan us lights.

For those who RV camp, there are 3 sites at the new Volunteer Fire Station just past the post office. There is electricity & water and a waste dump site at that location. The new fire station is a short walk from the observing field. We should be able to enter the fort property just behind the lodge hall.

We have decided not to go to a school during this visit. Instead, we will be working on setting up part of the memorial to Dave Brown and helping out at the fort in any way we can.

We will definitely be having a BBQ lunch on Saturday and the annual meeting of the Friends of Fort McKavett will follow. Don Huss, a founding member of the Friends of Fort McKavett and the husband of the Friends treasurer, Bobbie May Huss, passed away recently. We will remember him and celebrate his contributions to the Fort at the BBQ. We will also have a dedication ceremony for the memorial to Dave Brown and the crew of the STS 107. At this time, the plans are to have a small ceremony and then plan a larger one with lots of publicity when we return next March. By then we should have all of the pictures, items, write ups, etc. for the memorial in place and all of the electrical problems will be behind us.

Ft. McKavett Star Party— by Ken Lester

I will give an update on the status of the Fort at the September meeting and I will post updates on the list server. I hope that we will show Buddy and the staff at Fort McKavett our support during this trying time by attending this wonderful event!

NASA Mission Returns With a Piece of the Sun

08.19.04

In a dramatic ending that marks a beginning in scientific research, NASA's Genesis spacecraft is set to swing by Earth and jettison a sample return capsule filled with particles of the Sun that may ultimately tell us more about the genesis of our solar system.

This artist's conception shows the Genesis spacecraft in collection mode, opened up to collect and store samples of solar wind particles. Credit: NASA/JPL

"The Genesis mission -- to capture a piece of the Sun and return it to Earth -- is truly in the NASA spirit: a bold, inspiring mission that makes a fundamental contribution to scientific knowledge," said Steven Brody, NASA's program executive for the Genesis mission, NASA Headquarters, Washington.

On September 8, 2004, the drama will unfold over the skies of central Utah when the spacecraft's sample return capsule will be snagged in midair by helicopter. The rendezvous will occur at the Air Force's Utah Test and Training Range, southwest of Salt Lake City.

"What a prize Genesis will be," said Genesis Principal Investigator Dr. Don Burnett of the California Institute of Technology, Pasadena, Ca. "Our spacecraft has logged almost 27 months far beyond the moon's orbit, collecting atoms from the Sun. With it, we should be able to say what the Sun is composed of, at a level of precision for planetary science purposes that has never been seen before."

The prizes Burnett and company are waiting for are hexagonal wafers of pure silicon, gold, sapphire, diamond and other materials that have served as a celestial prison for their samples of solar wind particles. These wafers have weathered 26-plus months in deep space and are now safely stowed in the return capsule. If the capsule were to descend all the way to the ground, some might fracture or break away from their mountings; hence, the midair retrieval by helicopter, with crew members including some who have performed helicopter stunt work for Hollywood.

"These guys fly in some of Hollywood's biggest movies," said Don Sweetnam, Genesis project manager at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "But this time, the Genesis capsule will be the star."

The Genesis capsule -- carrying the agency's first sample return since the final Apollo lunar mission in 1972, and the first material collected beyond the Moon -- will enter Earth's atmosphere at 9:55 a.m. Mountain Time. Two minutes and seven seconds after atmospheric entry, while still flying supersonically, the capsule will deploy a drogue parachute at 33 kilometers (108,000 feet) altitude. Six minutes after that, the main parachute, a parafoil, will deploy 6.1 kilometers (20,000 feet) up. Waiting below will be two helicopters and their flight crews looking for their chance to grab a piece of the Sun.

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"Each helicopter will carry a crew of three," said Roy Haggard, chief executive officer of Vertigo Inc. and director of flight operations for the lead helicopter. "The lead helicopter will deploy an eighteen-and-a-half foot long pole with what you could best describe as an oversized, Space-Age fishing hook on its end. When we make the approach we want the helicopter skids to be about eight feet above the top of the parafoil. If for some reason the capture is not successful, the second helicopter is 1,000 feet behind us and setting up for its approach. We estimate we will have five opportunities to achieve capture."

The helicopter that does achieve capture will carry the sample canister to a clean room at the Michael Army Air Field at the U.S. Army Dugway Proving Ground, where scientists await their cosmic prize. The samples will then be moved to a special laboratory at NASA's Johnson Space Center, Houston, where they will be preserved and studied by scientists for many years to come.

"I understand much of the interest is in how we retrieve Genesis," added Burnett. "But to me the excitement really begins when scientists from around the world get hold of those samples for their research. That will be something."

JPL, a division of the California Institute of Technology, manages the Genesis mission for NASA's Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, developed and operates the spacecraft. Los Alamos National Laboratory and NASA's Johnson Space Center contributed to Genesis payload development, and the Johnson Space Center will curate the sample and support analysis and sample allocation.

News and information are available at http://www.nasa.gov/genesis. More detailed background on the mission is available at http://genesismission.jpl.nasa.gov/.

DC Agle (818) 354-5011
NASA's Jet Propulsion Laboratory

Donald Savage (202) 358-1727
NASA Headquarters, Washington, D.C.

2004-207

In the spring of 2004, the Genesis team performed mid-air retrieval training at the Utah Test and Training Range. On Sept. 8, 2004, over the same location training range they trained on, one of two Genesis helicopters will capture the Genesis sample return capsule in mid-air, then land it gently on the ground where trained ground crew will disconnect the parafoil. Then, the helicopter will carry the capsule back to a clean room facility located on a nearby airfield for preliminary inspection and disassembly.

Credit: NASA/JPL

Central Texas Star Party 2004

By Matt Hommel

And so it was that in mid August 2004, a few brave members of the JSCAS ventured westward across the great state of Texas in search of dark skies, fresh air, and a modicum of relaxation. Their destination…CTSP.

CTSP Observing Field

I, with my wife Lisa and our two girls, Piper and Lia, ventured out on Friday, arriving around 4:30. The skies were looking marginal at best but we figured we would just cross our fingers and go with the flow. Even though we were pre-registered, we figured "better safe than sorry", so we double checked our registration at the observatory before heading down the road for a pizza at Don Vito's.

The social hour started at 8:00 back at the observatory. Naturally we were running a bit late (those of you with kids understand). I barely got everything set up in time for sundown. I brought our LX200 and the girls' DS90 as well as my video and still photo gear, laptop, etc…. In an unexpected coincidence, when I pulled out my video camera. It caught the eye of the observer at the table next to me. It turns out that in addition to astronomy we also had videography in common. I am sure we bored our wives senseless with our endless chatter about optics but they were good sports about it.

Observing Field at Night

My girls had fun making some new friends: two other young girls, each four years old. They all had a blast together finding globular clusters and renaming them. Just so you all know, M22 is now called the Kim Possible Cluster, and the 2 bright stars in the Owl Cluster have been re-named Piper and Lia. To be honest I don't know the actual names for them so who was I to argue.

Observing Friday night was very good and there were several meteors to add to the experience. I took advantage of the dark background sky to check out many nebulae in the LX while the girls mainly viewed double stars and clusters. The Lagoon Nebula was awesome in the LX as were the Eagle and Trifid nebulas. I could just make out the Pillars of Creation. I had the girls set up on the DS with a 40mm 2 inch eyepiece that yields a 2.25 degree field of view. The Milky Way was fantastic. No matter where you pointed the scope, the eyepiece was filled with brilliant specks of light. Exhaustion as well as some haze started to take its toll on us around 2:00 a.m. so we called it a night.

Saturday, we got out to the field a bit earlier, around 7:30, to participate in the drawing for door

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prizes. It was then that I found out why this star party wasn't that popular with folks who have to travel. Apparently the weather has been so horrible almost every time they have had this party that they actually gave out umbrellas as door prizes. The umbrellas were donated by Scopetronix. The news of the weather curse had traveled far. They did the drawings for the kids first and my 5 year old got to draw a name. Coincidentally, she picked Megan, one of the other junior female astronomers at CTSP who was standing right next to her. Later they drew for the adult prizes and they guy next to me won an Orion telescope.

Viewing on Saturday was also very good. I spent most of the night viewing globular clusters. I just like the look of globs in a Schmidt Cass. My girls unlocked the clutches on the DS and toured the Milky Way while I racked up well over 100,000,000 light years on my favorite wide-angle eyepiece. After the wide-angle work, it was time for planets. The seeing had degraded to an extent but Uranus was a stable disk at 150X. After that it was on to Neptune. Neptune was a stable disk and just to its lower left, around the 7 o'clock position, I saw *it*. I asked my new friend Joe, the camera guy, to verify where he had seen *it* and he stated the same location, around 7 o'clock or down and to the left. *It* was Triton, plain as day! Well, you get the idea. I am told Triton, at 3 billion miles away, never gets brighter than magnitude 13.5, about the same as Pluto. That was a big one for me and at the magnification I was using I was even more impressed.

Around 1:00 am the haze rolled in and killed the viewing for about an hour. When it cleared up, it really cleared up. The Andromeda Galaxy had risen high enough to get a great view of it. The view in the LX was too narrow for my taste so I swung the DS over to it and it blew my mind. I got the whole Andromeda Galaxy and its two companions in the eyepiece at the same time. It looked like a photograph (remember, we were all very dark adapted).

After all the successes we were having, I didn't figure there was any way to top it. So we wrapped up around 3:00 a.m. and went back to the lodge for some well-deserved sleep.

I have to call this trip a real success. It wasn't always a cake walk but no road trip is. If you decide to venture out to Canyon of the Eagles for the next CTSP, you will no doubt see my family and me there. Oh yes, one last thing: as a city dweller it took me a while to realize that those big birds flying around all over the Canyon of the Eagles park **are** eagles, they're just not bald eagles.

Sundown at CTSP

The Central Texas Star Party is an annual event sponsored by the Austin Astronomical Society. It is held at the Eagle Eye Observatory, Canyon of the Eagles Lodge and Nature Park, northwest of Austin.

All images by the author.

Member Recognition

Becky Ramotowski's image of a crimson "blue Moon" appeared on spaceweather.com on August 1st.

A Homemade, Low Cost Digital Camera Adapter

Richard Nugent

After buying a digital camera, it was natural to start using it to take photos through the telescope. Nowadays, there are so many digital cameras and various types of adapters. Without actually seeing the adapter on your particular camera it's hard to decide whether to buy one. And there is the additional weight introduced by the camera and adapter.

After buying a Pentax Optio 555 digital camera, I wanted a simple eyepiece adapter. This Pentax camera, like many other small cameras, doesn't have any threaded rings, rather it has an extendable lens that comes out when the camera is turned on. This lens (see photo) also moves a bit when you use the telephoto function of the camera.

To make a low weight, low cost eyepiece, you'll need a 1 ½" PVC tube (the tube size needed will vary for your particular camera), a hacksaw and some peel and stick Velcro. Choose a piece of PVC with an inside diameter larger than your eyepiece and camera lens. At this point don't worry if it's too big. Cut the PVC long enough to fit over your eyepiece and camera lens. Now use the peel and stick Velcro and place it inside the cut PVC tube to make the eyepiece and camera lens fit snug.

The fit of the eyepiece and camera lens should not be too tight. Experiment with the Velcro and its positioning to get a snug fit. It might take more than one layer of Velcro to make the eyepiece and lens fit.

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Notice in the photo of the camera on the telescope, the strap is wrapped around the eyepiece holder of the telescope. This is an important safeguard. Digital cameras have an automatic battery saver and the camera will turn off after 3-4 minutes if not in constant use. So if you walk away from the telescope and the camera turns off, the lens will retract and the camera will FALL OFF THE ADAPTER. So use the camera strap to keep your camera from hitting the ground

The cost of the PVC tube is around $1-$2, and another few dollars for Velcro. Typically the adapter will weight 20-30 grams. So for under $10 and about 30 minutes of your time, you can make a custom adapter for your digital camera.

Upcoming Events

CHALLENGER 7 STAR PARTY: JSCAS will host a public star party at Challenger 7 Memorial Park on September 18th.

JSCAS FALL FORT MCKAVETT STAR PARTY: This year's fall star party at Fort McKavett will be held October 7-10. Visit http://www.riverofstars.net/JSCAS/StarParties/starparty.htm for more information.

OKIE-TEX STAR PARTY: The 21st annual Okie-Tex Star Party will be held October 9-17 at Camp Billy Joe, Kenton, Oklahoma. Sponsored by the Oklahoma City Astronomy Club, activities include speakers Brian Lula and Dick Parker, vendors, door prizes and dark sky observing. For more information contact Larry Beatty, ldbeatty@aol.com or to register, go to http://www.okie-tex.com.

ELDORADO STAR PARTY: The second Eldorado Star Party (ESP), to be held October 13-16, is now taking pre-registrations. For more information, visit http://www.eldoradostarparty.org.

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

Ring of Stellar Death

NASA/JPL-Caltech/J. Hora (Harvard-Smithsonian CfA)

This false-color image from NASA's Spitzer Space Telescope shows a dying star (center) surrounded by a cloud of glowing gas and dust. Thanks to Spitzer's dust-piercing infrared eyes, the new image also highlights a never-before-seen feature -- a giant ring of material (red) slightly offset from the cloud's core. This clumpy ring consists of material that was expelled from the aging star.

The star and its cloud halo constitute a "planetary nebula" called NGC 246. When a star like our own Sun begins to run out of fuel, its core shrinks and heats up, boiling off the star's outer layers. Leftover material shoots outward, expanding in shells around the star. This ejected material is then bombarded with ultraviolet light from the central star's fiery surface, producing huge, glowing clouds -- planetary nebulas -- that look like giant jellyfish in space.

In this image, the expelled gases appear green, and the ring of expelled material appears red. Astronomers believe the ring is likely made of hydrogen molecules that were ejected from the star in the form of atoms, then cooled to make hydrogen pairs. The new data will help explain how planetary nebulas take shape, and how they nourish future generations of stars.

This image composite was taken on Dec. 6, 2003, by Spitzer's infrared array camera, and is composed of images obtained at four wavelengths: 3.6 microns (blue), 4.5 microns (green), 5.8 microns (orange) and 8 microns (red).

Mars Rover Scientific Data On-line

Media Relations Office
Jet Propulsion Laboratory
California Institute Of Technology
National Aeronautics And Space Administration
Internet Advisory: 2004-190
August 3, 2004

Millions of people have viewed pictures from NASA's rovers on the Mars Rovers home page and other Internet sites. Now, a more complete set of science data from Spirit's and Opportunity's first 30 Martian sols has been posted on a site primarily for scientists and technical researchers, but also available to anyone who's interested.

The first installment of images, spectroscopic measurements, daily reports, and other information from NASA's Mars Exploration Rover project has been posted on NASA's Planetary Data System. It is available with a new "Analyst's Notebook" user interface at: http://pds-geosciences.wustl.edu/meran. Home page for the Planetary Data System is http://pds.jpl.nasa.gov. Images are also available from the system's Planetary Image Atlas, at http://pdsimg.jpl.nasa.gov/cgi-bin/MER/search?INSTRUMENT_HOST_NAME=MARS_EXPLORATION_ROVER. Data from later portions of both rovers' missions will be added in October.

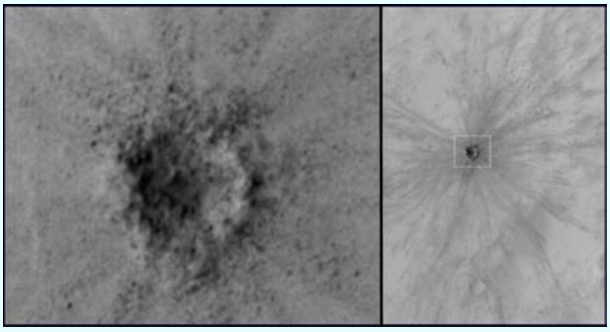
Mars Orbiter Camera

The story of the Mars Orbiter Camera (MOC) onboard the Mars Global Surveyor (MGS) spacecraft began with a proposal to NASA in 1985. The first MOC flew on Mars Observer, a spacecraft that was lost before it reached the red planet in 1993. Now, after 14 years of effort, a MOC has finally been placed in the desired mapping orbit.

HAPPY FACE CRATER

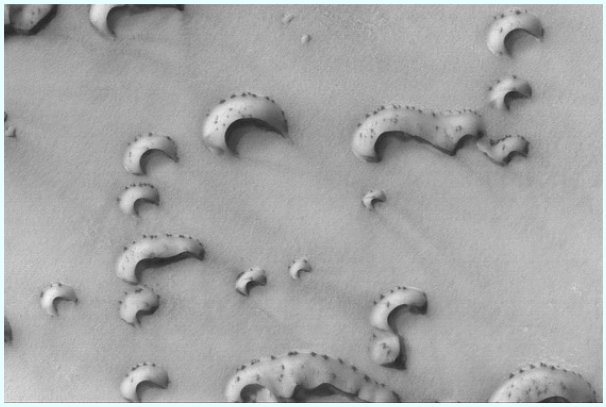
The MOC team's happiness is perhaps best expressed by the planet Mars itself. On the first day of the Mapping Phase of the MGS mission--during the second week of March 1999--MOC was greeted with this view of "Happy Face Crater" (center right) smiling back at the camera from its location on the east side of Argyre Planitia. This crater is officially known as Galle Crater, and it is about 215 kilometers (134 miles) across. The picture was taken by the MOC's red and blue wide angle cameras. The bluish-white tone is caused by wintertime frost. Illumination is from the upper left. For more information and Viking Orbiter views of "Happy Face Crater," see http://www.msss.com/education/happy_face/happy_face.html.

FRESH CRATER



This full-resolution (1.5 meters, 5 feet, per pixel) Mars Global Surveyor (MGS) Mars Orbiter Camera (MOC) image shows a fairly small, fresh meteor impact crater in far southeastern Arabia Terra. The crater's bowl, rim, and ejecta exhibit numerous boulders. The image covers an area about 3 km (1.9 mi) wide and is located near 6.9°S, 317.1°W. Sunlight illuminates the terrain from the left.

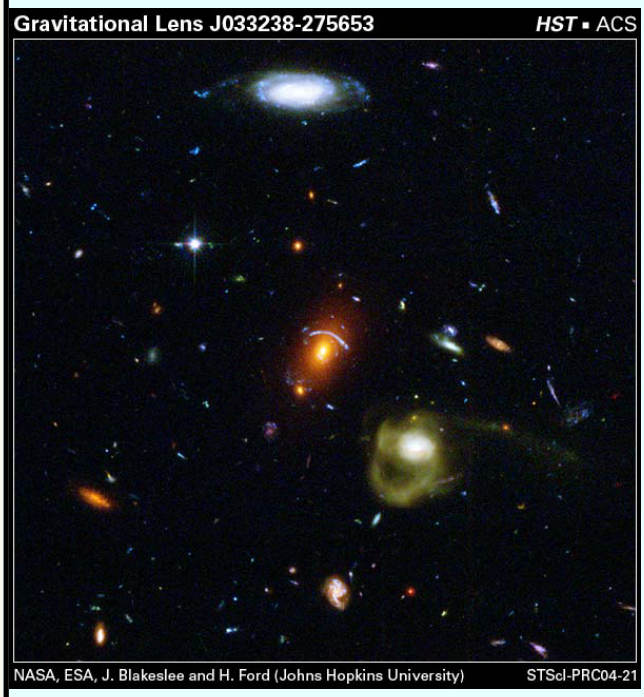
SPOTTY MARTIAN DUNES



Frost-covered dunes develop spots and streaks as they begin to defrost in springtime. This April 2004 Mars Global Surveyor (MGS) Mars Orbiter Camera (MOC) image shows a suite of north polar dunes in the early stages of the defrosting process. At the time the image was acquired, Mars was only 1 month into the northern spring season. The picture is located near 75.9°N, 266.0°W, and is illuminated by sunlight from the lower left. The image covers an area about 3 km (1.9 mi) wide.

All images and text provided by NASA/JPL/Malin Space Science Systems.

A Day in the Lives of Galaxies



Like a photographer clicking random snapshots of a crowd of people, NASA's Hubble Space Telescope has taken a view of an eclectic mix of galaxies. In taking this picture, Hubble's Advanced Camera for Surveys was not looking at any particular target. The camera was taking a picture of a typical patch of sky, while Hubble's infrared camera was viewing a target in an adjacent galaxy-rich region.

The jumble of galaxies in this image, taken in September 2003, includes a yellow spiral whose arms have been stretched by a possible collision [lower right]; a young, blue galaxy [top] bursting with star birth; and several smaller, red galaxies.

But the most peculiar-looking galaxy of the bunch – the dramatic blue arc in the center of the photo — is actually an optical illusion. The blue arc is an image of a distant galaxy that has been smeared into the odd shape by a phenomenon called gravitational lensing. This "funhouse- mirror effect" occurs when light from a distant object is bent and stretched by the mass of an intervening object. In this case the gravitational lens, or intervening object, is a red elliptical galaxy nearly 6 billion light-years from Earth. The red color suggests that the galaxy contains older, cooler stars.

The distant object whose image is smeared into the long blue arc is about 10 billion light-years away. This ancient galaxy existed just a few billion years after the Big Bang, when the universe was about a quarter of its present age. The blue color indicates that the galaxy contains hot, young stars.

Gravitational lenses can be seen throughout the sky because the cosmos is crowded with galaxies. Light from distant galaxies, therefore, cannot always travel through space without another galaxy getting in the way. It is like walking through a crowded airport. In space, a faraway galaxy's light will travel through a galaxy that is in the way. But if the galaxy is massive enough, its gravity will bend and distort the light.

Long arcs, such as the one in this image, are commonly seen in large clusters of galaxies because of their huge concentrations of mass. But they are not as common in isolated galaxies such as this one. For the gravitational lens to occur, the galaxies must be almost perfectly aligned with each other.

Gravitational lenses yield important information about galaxies. They are a unique and extremely useful way of directly determining the amount of mass, including dark matter, in a galaxy. Galaxies are not just made up of stars, gas, and dust. An invisible form of matter, called dark matter, makes up most of a galaxy's mass. A study of this newly discovered system, dubbed J033238-275653, was published in the Astrophysical Journal Letters. This study, together with similar observations, may allow astronomers to make the first direct measurements of the masses of bright, nearby galaxies.

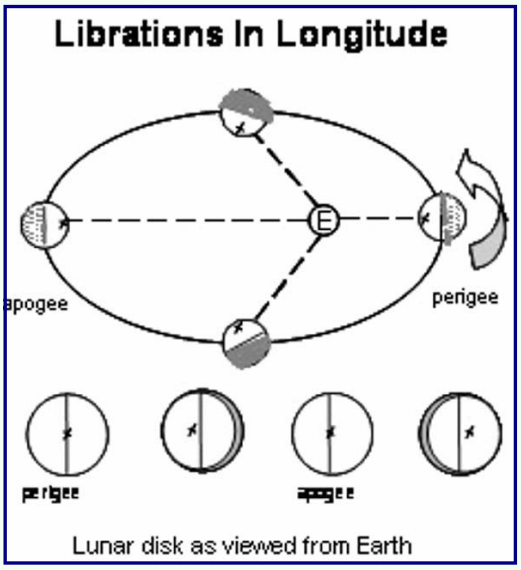
Credit: NASA, ESA, J. Blakeslee and H. Ford (Johns Hopkins University)

Astronomy 101

Librations of the Moon

Ken Lester

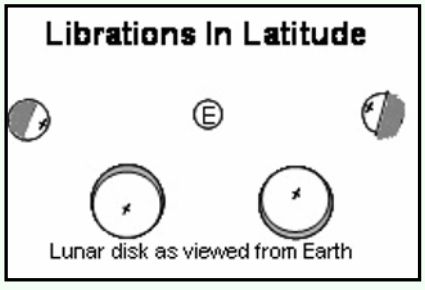
Any casual observer of the Moon can tell you that the same side of the Moon always faces the Earth. The Moon completes one rotation about its axis in the same time it takes to complete one revolution around the Earth. This is called synchronous rotation. With synchronous rotation, you'd always expect the same hemisphere of the Moon to face the Earth. Fortunately for Earth-based observers, the oscillating motions of the Moon allows us over the course of a lunar month to glimpse views of parts of the far side of the Moon. These motions are called librations.



With librations, thin crescents of the far side of the moon are brought into view at certain times during the lunar month. These crescents are the largest with librations in longitude and latitude.

The accompanying diagrams demonstrate the type of librations. Each diagram has one or more representations of the Moon. On each picture of the Moon there is a point, marked with an 'x', that is the intersection of the prime meridian and the equator. Those areas of the far side of the Moon visible from Earth are shaded gray in the diagrams.

Librations in longitude are due to the axial velocity of the Moon being constant while its orbital velocity around the Earth is constantly changing. The Moon's orbital velocity is a minimum at apogee, accelerating to a maximum at perigee at which time it begins decelerating until it once again reaches apogee. Apogee is that point in the Moon's orbit where the Moon is farthest away from Earth. Perigee is that point in the Moon's orbit where the Moon is the closest to Earth. Starting at perigee, the Moon completes ¼ of its trip around its orbit of Earth before it completes 90° of rotation. This results in the lunar disk being slightly to the left, revealing a small area on the right which would normally be hidden. At apogee the rotation and orbit catch up and only the Moon's near side is visible. Starting from apogee, the Moon completes 90° of rotation before it completes ¼ of its orbit. This reveals a small area on the left that also would have been hidden. At perigee, the orbit and rotation again are in sync, showing only the near side. The total displacement in longitude due to libration is ±7°54'.



Latitude librations are the result of the Moon's axis being tilted to its orbital plane by 6.41°. Since the Moon's axis always points to the same point in space, displacements in latitude due to libration amount to ±6°50'.

Librations in longitude and latitude occur at the same time and their combined effects bring into view libration zones.

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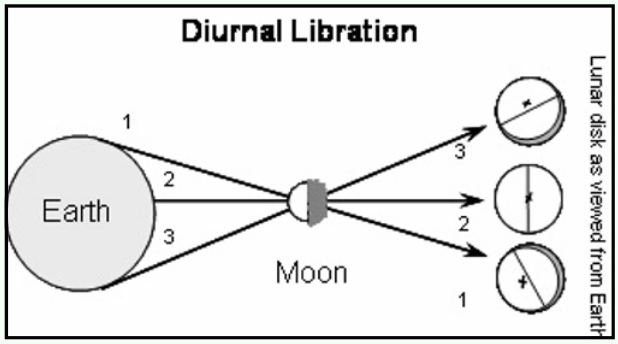


An additional 1º of libration is obtained due to diurnal libration. Diurnal libration occurs when the Moon is observed from different points on the Earth's surface. A person observing the rising Moon will observe a slightly different area than a person who is observing the Moon at the zenith.

The last libration type, physical libration, is caused by gravitational irregularities in the rotation of the Moon. Physical librations are small (measured in minutes of arc) and are of importance to astronomers studying the internal structure or shape of the Moon.

While it is true that at any given time only 50% of the lunar surface can be observed, librations allow us to observe around 59% of the Moon's surface from Earth over the course of the lunar month.

Charlie's Challenge

Charles Hudson

THIS MONTH'S CHALLENGE

Science Stumper #67: Why is the output of an incandescent bulb excessive in the red and deficient in the blue?

Answer will be published in the October issue.

LAST MONTH'S CHALLENGE

My slide projector contains, near the high-intensity incandescent bulb, a system of lenses to direct the light to the slide. One of the elements of this system is a bluish colored circular slab of glass with parallel sides.

Science Stumper #66: What is the function of this bluish element?

Answer to Science Stumper #66: I was curious about this question in 1976. I asked the fellow who developed my film. He replied that it was a heat-condensing lens. In other words, it was in the beam to absorb the infrared light that might damage the slide. I thought that, before I make a fool out of myself repeating this to the club, I ought to do some simple testing. First, I turned the projector on and put my hand in the beam. I could not feel any heat. I left the projector on for 5 minutes and then removed the element in question to see if it was hot. I burned my fingers. I turned the projector back on and put my hand in the beam again. Without this blue glass disk, the beam now felt warm.

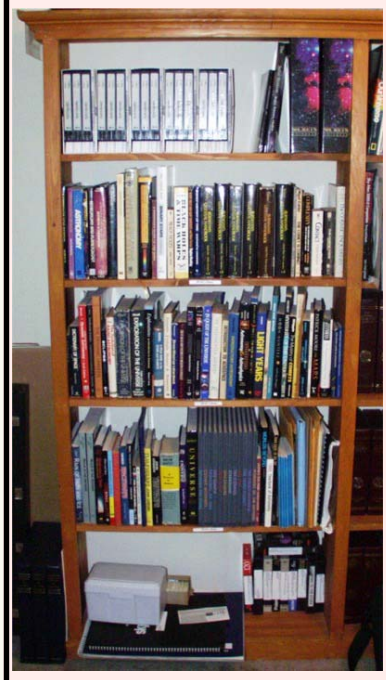
The disk is blue to absorb some of the reds and yellows that dominate the output of any incandescent bulb, and would distort the color of the projected slide.

For Sale

Tokina 80mm-200mm f2.8 zoom telephoto lens with lens hood and tripod adapter built in. Fits Olympus 35 mm cameras. $100. Contact Richard Nugent at rnugent@wt.net.

JSCAS Library

Lisa Lester



JSCAS Library

The JSCAS library received several donations at our August meeting! Thank you so much to Charles Hudson, Bob Hammond, and Drel Setzer for their donations. Donated are lesson plan materials for junior high and senior high teachers. The packet contains the following: *Amazing Space: Hubble Deep Field*: *Lesson Package, Imagine The Universe: Activity Booklet Grades 9-12*, and *Spin A Spectrum Grades 9-12*. Also donated was a set of DVDs entitled: *Einstein's Relativity & the Quantum Revolution Parts 1 and 2* which were checked out that night by one of our new members! Completing the list of donations at the meeting was the book, *The Ultimate Universe* by David Levy.

Another donation this month was from Ken Lester. Ken donated the books *Time Warps* and *Space Warps* by John Gribbin.

Finally, it is JSCAS' great honor to be the recipient of J.C. Meador's astronomical library. Dot Meador, J.C.'s wife, donated his library to the club in his memory. The donation includes a five part astronomy course consisting of three VHS tapes and a booklet for each part. The course is taught by Professor Alex Filippenko and is entitled: *Understanding the Universe: An Introduction to Astronomy*. Also included are the books: *The New Solar System*, *Observer's Handbook for 2001* by the Royal Astronomical Society of Canada, and *Secrets of the Universe* consisting of two binders containing information on the Earth, our solar system, the cosmos, plus lots more.

A reminder to those who have had library materials for awhile, if you are ready to turn them back in, please bring them to the September meeting.

Visit the library on the web at:
http://www.riverofstars.net/JSCAS/Library/Library.htm

Hubble News

Ken Lester

The Space Imaging Spectrograph (STIS), one of four instruments aboard the Hubble Space Telescope, malfunctioned on August 4th. STIS accounts for 30% of all Hubble scientific observation programs. The high sensitivity and spatial resolution of STIS enabled astronomers to search for massive black holes and study star formation, planets, nebulae, galaxies, and other objects in fine detail. An Anomaly Review Board investigation is underway to determine if the instrument is recoverable.

Sky & Telescope Discount Subscriptions

Renewing your subscription to Sky & Telescope? Subscribing for the first time? Contact David Haviland, tcell@hal-pc.org, to take advantage of the JSCAS Club Discount before you subscribe!

MEMBER'S GALLERY

This month's Member's Gallery features Astro-Art by Dennis Webb. Dennis is a senior manager for NASA at JSC and served as our club president from 1994 to 1995. He is an innovative and informative speaker, making presentations at JSCAS, Fort Bend Astronomical Society and the Texas Star Party to name a few. He is well known for his observations of Arp's Peculiar Galaxies. The art work featured are from images taken at Fort McKavett State Historical Site, home of our upcoming October Fort McKavett Star Party.

In the Night: Waiting - 2001

Astronomers wait for the night sky to clear over Fort McKavett State Historical Park in Texas. With shutter open, the color print film squeezes faint light from darkness into saturation. The lights of San Angelo glow green on faraway clouds. Darker clouds encroach on the turning stars, framed by trees and ruined wall. Flashlights and computer screens glow red as the astronomers wait for clearing sky that does not come. Hernan Contreras and Buddy Garza called us to this night. Jeff Rowe revealed the play of film, night sky, and time. We wait together.

Exhibited:

2003 The Show, Museum of New Mexico, Museum of Fine Arts, Santa Fe, NM
2002 Annual Juried Photography Show, The Arts Alliance Center at Clear Lake, Houston TX - Honorable Mention

In the Night: Spirit -2001

An astronomer packs up the telescope near the end of a long night, near the ruined wall. Or was it the ghost of Fort McKavett?

Exhibited:

2002 Annual Juried Photography Show, The Arts Alliance Center at Clear Lake, Houston TX - Honorable Mention

In the Night: Tree - 2001

The old dead tree, painted with astronomer's red flashlight. I have photographed this tree many times with a new result each time.

Exhibited:

2002 Annual Juried Photography Show, The Arts Alliance Center at Clear Lake, Houston TX - Honorable Mention

Retablo: Pursuit of M101 - 2001

Observing friend Len Casady with the McKavett Tree, galaxy M101 recedes and is captured in red, with the International Space Station approaching the star Vega. Digital collage of three film photographs and digital astrophotograph made in various locations. Gold leaf on tin background

Exhibited

2002 Digital Arts Competition, The Arts Alliance Center at Clear Lake
2002 Texas Star Party Art Show, Ft. Davis TX, Best Mixed Media Award

Visual Observing

Chris Randall

September 2004

SSO: (Solar System Objects) Summary for the 15 September 04

Object	Const	Mag	% Ill	Rise Time	Transient	Set Time
Sun	Leo	-26.7	100	07:05	13:15	19:24
Moon	Vir	----	3	08:01	14:09	20:16
Mercury	Leo	-0.9	74	05:56	12:20	18:45
Venus	Cnc	-4.2	64	03:48	10:29	17:11
Mars	Leo	1.7	100	07:08	13:17	19:31
Jupiter	Vir	-1.7	100	07:29	13:35	19:44
Saturn	Gem	0.8	100	02:36	09:28	16:20
Uranus	Aqr	5.7	100	18:26	00:07	05:44
Neptune	Cap	7.9	100	17:19	22:44	04:06
Pluto	Ser	13.9	99	13:29	19:01	00:28
2001 Q4 Neat	Dra	8.7	95	----	14:56	----

Highlighted times denote daylight events.

BSO: (Bright Sky Objects)
NGC 7092 (M 39) – Open Cluster in Cygnus, Magnitude 4.6, Size 31'.
NGC 6882 (H-22-8) – Open Cluster in Vulpecula, Magnitude 5.5, Size 18'.
NGC 6885/2 (T71&72) – Open Cluster in Vulpecula, Magnitude 5.9, Size 22'.
NGC 7078 (M 15) – Globular Cluster in Pegasus, Magnitude 6.4, Size 12'.

DSO: (Dark Sky Objects)
NGC 6838 (M 71) – Globular Cluster in Sagitta, Magnitude 8.3, Size 7' .
NGC 7009 (C 55) – Planetary Nebula in Aquarius, Magnitude 8.3, Size 30". Saturn Nebula.
Arp 93 (NGC 7284+5) – Galaxy System in Aquarius, Magnitude 12.8, Size 2'.
NGC 6888 – Bright Nebula in Cygnus, Magnitude ?, Size 20'. Crescent Nebula.

CDMP: (Chris' Don't Miss Pick)
NGC 6853 (M 27) – "Dumbell" Planetary Nebula in Vulpecula, Magnitude 7.4, size 7'.

The Dumbbell Nebula M27 was the first planetary nebula ever discovered. On July 12, 1764, Charles Messier discovered this new and fascinating class of objects, and describes this one as an oval nebula without stars. The name "Dumbbell" goes back to the description by John Herschel, who also compared it to a "double-headed shot."

This planetary nebula is certainly the most impressive object of its kind in the sky, as the angular diameter of the luminous body is nearly 6 arc minutes, with a faint halo extending

(Continued on page 20)

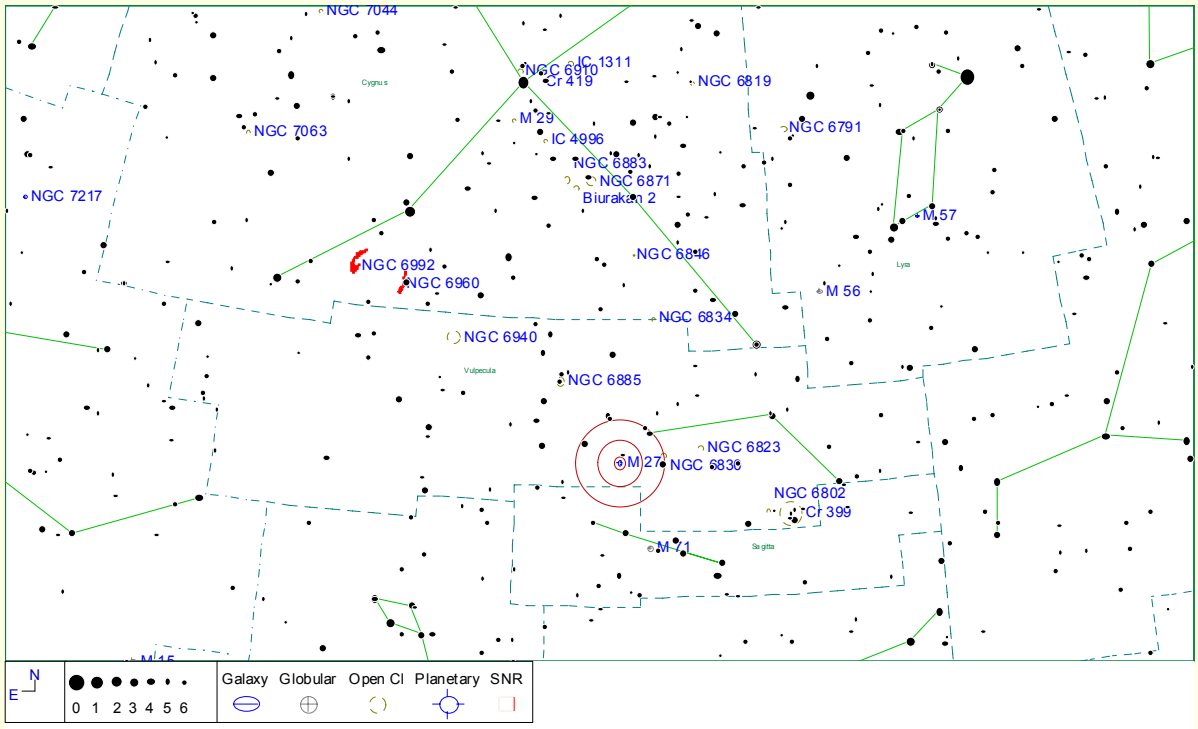
(Continued from page 19)

out to over 15', half the apparent diameter of the Moon (Millikan 1974). It is also among the brightest, being at most a little less luminous (with its estimated apparent visual magnitude 7.4) than the brightest, the Helix Nebula NGC 7293 in Aquarius. The Helix, with its visual magnitude of 7.3, has a much lower surface brightness because of its larger extension (estimates from Stephen Hynes); it is a bit unusual that this planetary is only a little fainter photographically (magnitude 7.6). Hartmut Frommert, one of the SEDS database authors, was surprised how fine this object was seen in his 10x50 binoculars under moderately good conditions!

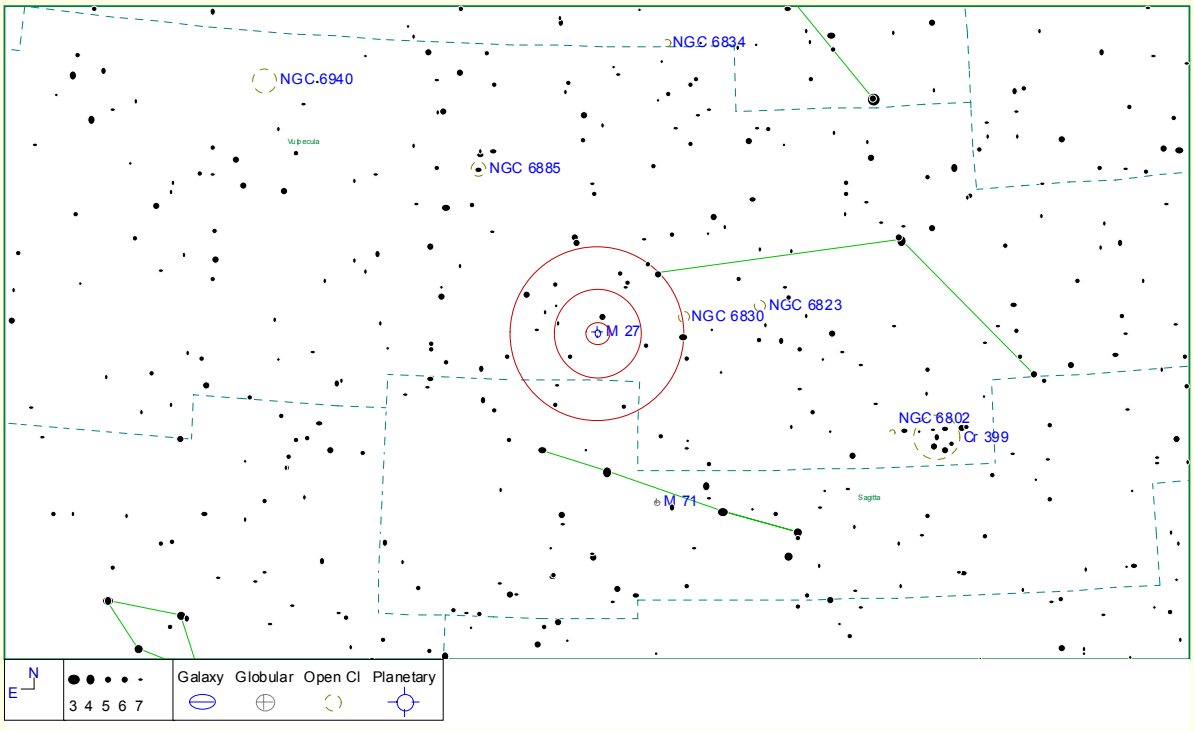
M27 — ©Al Kelly

The central star of M27 is quite bright at magnitude 13.5, and an extremely hot blueish subdwarf at about 85,000 K (so the spectral type is given as O7 in the Sky Catalog 2000). K.M. Cudworth of the Yerkes Observatory found that it probably has a faint (magnitude 17) yellow companion at 6.5" in position angle 214° (Burnham).

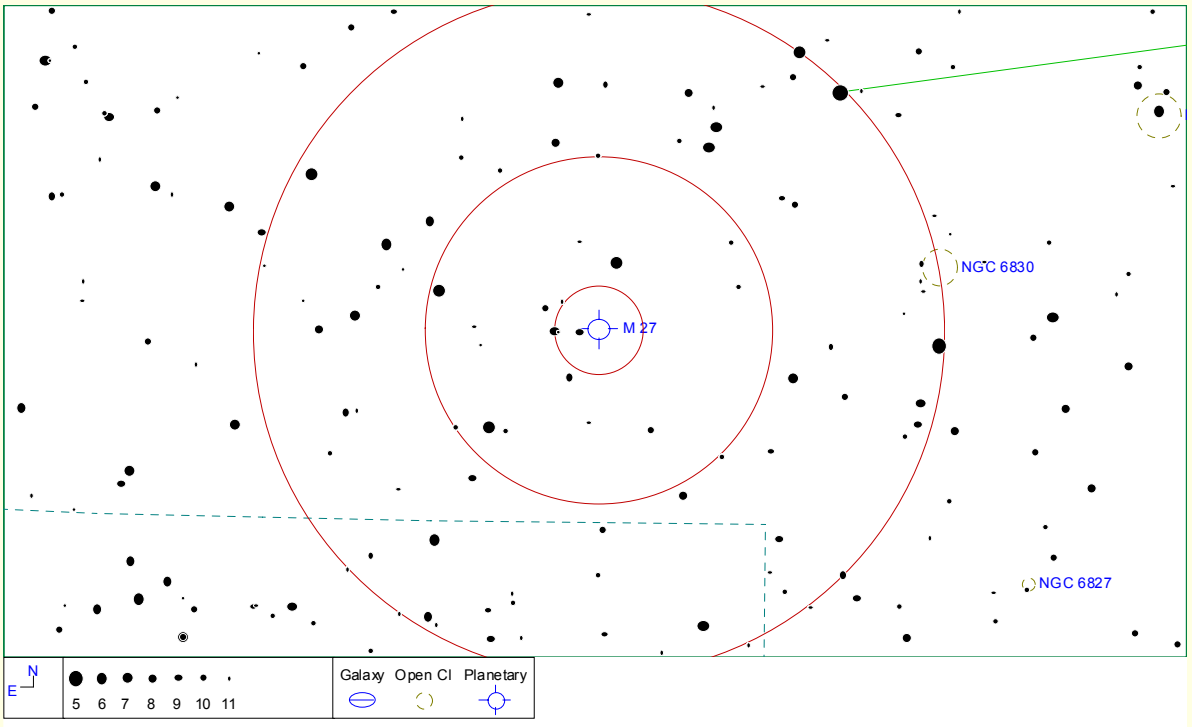
For More information go to http://www.seds.org/messier/m/m027.html.



Star chart (overview) for finding M27.



Star chart (moderate detail) for finding M27.



Star chart (detailed) for finding M27.

Messier Certificate Presentation

Past president, John Erickson, was awarded the club's Messier Certificate for successfully logging all Messier objects. Awards chairman, Triple Nickel, made the presentation during the August meeting.

Congratulations John!

ORIGINS Miniseries

Has the universe always existed? How did it become a place that could harbor life? What was the birth of our planet like? Are we alone, or are there alien worlds waiting to be discovered? NOVA presents some startling new answers in *Origins*, a groundbreaking four-part NOVA miniseries hosted by dynamic astrophysicist Neil deGrasse Tyson, Director of the Hayden Planetarium at the American Museum of Natural History. Tyson leads viewers on a cosmic journey to the beginning of time and into the distant reaches of the universe, searching for life's first stirrings and its traces on other worlds.

Original PBS Broadcast Dates: September 28, 8-10 p.m. and September 29, 8-10 p.m., 2004. Check local listings for exact dates and times.

ASTRONOMICAL SOCIETY OF THE PACIFIC

NOVA

NASA Night Sky Network Telecon:
NOVA: *Origins* Miniseries
September 8 at 9PM ET, 6 PM PT

The NASA Night Sky Network, in association with the PBS science series NOVA and with JPL are pleased to announce the opportunity for you to speak directly with Dr. Neil deGrasse Tyson, one of the world's top astrophysicists and Director of the Hayden Planetarium at the American Museum of Natural History in New York City.

This exclusive Night Sky Network teleconference will be held on
Wednesday, September 8 at 9PM ET, 6PM PT.
Call-in information:
USA Toll Free Number: **888-791-1856**
USA Toll Number: +1-773-756-4602
PASSCODE: NIGHT SKY NETWORK
You will be asked for the passcode, your name, and the name of your astronomy club.
Any of your club members may participate in the telecon.

Johnson Space Center Astronomical Society

An association of amateur astronomers dedicated to the study and enjoyment of astronomy. Membership is open to anyone wishing to learn about astronomy.

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Chris Randall

September Meeting Agenda

September 10th Center for Advanced Space Studies/Lunar Planetary Institute, 3600 Bay Area Blvd. (at Middlebrook Drive).

7:30	Meeting start and welcome
7:40	Presentation — "Ancient Astronomers and their Instruments", Hernan Contreras
8:30	Break
8:45	Calendar review, presentations, and awards
8:50	Star Party Announcements, Lisa Lester
9:10	Deep Sky Observing, Chris Randall
9:30	Charlie's Challenge, Charles Hudson
9:50	Door Prizes

Starscan Submission Procedures

Original articles of astronomical interest will be accepted up to 6 P.M. September 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
NASA/JPL

A helicopter practices grabbing the Genesis Sample Return Capsule, set to return to Earth on September 8th. A few hundred feet above the vast, unoccupied grounds of the Utah Test and Training Range, the parachuting sample will be captured by a helicopter and gently delivered to the ground.