STARSCAN

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Texas-Sized Astrophotos in New Mexico

Shane Ramotowski

It is common for astronomers to want bigger, bigger, bigger. I too seem to be affected by this condition. Most astronomers get aperture fever. I don't seem to have contracted that particular disease — I went from a 4 inch reflector to a 6 inch Maksutov-Cassegrain and then to a 5 inch refractor. No, I seem to have a different affliction: film format fever!

I've been doing 35mm photography since I was in elementary school. A few years ago, I stepped up to medium format with a Mamiya 645 medium format camera. Its transparency is 60mm by 45mm, almost 4 times larger than 35mm. It captures some fantastic images. Last year, I made the big jump: a large format 4x5 view camera. 4x5 sheet film is over 25 times larger than 35mm. 4x5 contact sheets are larger than standard prints from other formats. THIS IS FUN STUFF!

The Toyo 45CX is an entry level large format monorail view camera that can do pretty much everything that a view camera should. There are lots of advantages to view camera photography:

- Movements – the front and back of the camera move and can be tilted up, down, left and right. This lets you correct or distort based on perspective and focal zones.
- Sheet Film Holders – For each shot, you have to put a sheet of film in a special light-proof holder. This means that you can use a different type and/or speed every time you trip the shutter.
- Ground Glass – You look at a plate of glass while composing your picture. You get to see exactly what it will look like (except it's upside-down and backwards) before you take the picture.

You get to look cool while taking photos. Ansel Adams was cool, wasn't he?

Of course, other than really nice refractors, nothing is perfect. There are also some disadvantages:

- Primitive – Compared to modern cameras, most view cameras are primitive containing no electronics or anything else to help you out.
- No Meter – Do you remember the f/16 rule? You're either going to need that or a hand-held spot or incidence meter.
- Lots of Setup Time – This is not a point and shoot camera; it is too large and heavy to hold and the exposures are generally too long to do without a tripod anyway.

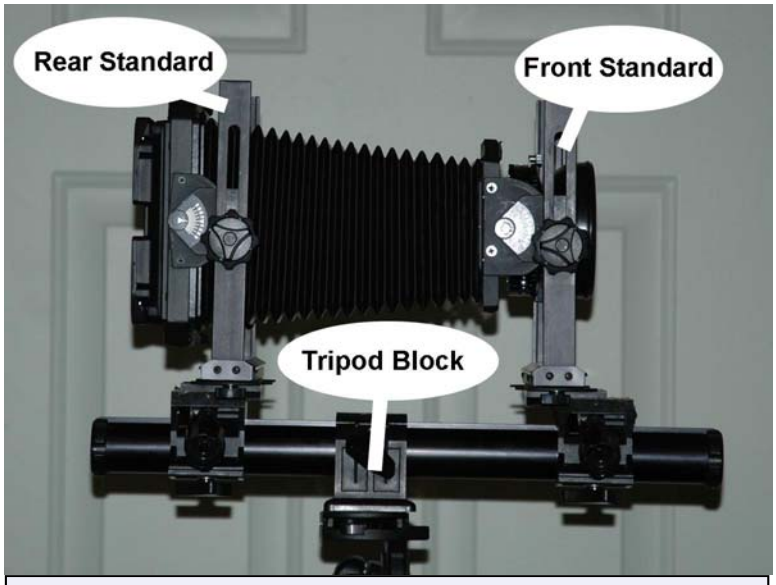

Figure 1 - Toyo 45CX View Camera

- Expensive – Each shot is about $5 between film and processing. This means you tend to make each shot count.
- No Mercy — If your shot is bad, it's your own fault. You can't blame the camera — it didn't do anything to help or hinder you.

People look at you kind of strange as they click their little digital cameras.

These cameras are a lot of fun to use and will teach you stuff about photography that you didn't even know existed. There is really only one problem: Every time I get a

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new camera, it seems to get pointed up at the night sky.

Challenges & Solutions

So now that I've decided to do large format astrophotography, reality sets in. The 45CX was just not designed by an astrophotographer. Problems, problems, and problems. Some can be solved and some cannot.

Film Choices

Walk in to any camera store and say: "I'd like a box of Fuji Provia 400 sheet film, please." They won't have it. Ask for any color transparency film higher than ASA 400. It just doesn't exist. They do have some ASA 400 black and white negative film.

So, I guess I can start shooting black and white astrophotos … Naw, I'll just have to do longer exposures. Unfortunately, most large format lenses have maximum apertures around 5.6. Since wide open astrophotos are rarely good, I end up shooting at f/8 or so. ASA 100 at f/8 means 1 or 2 hour exposures.

Stability

The 45CX has an 18 inch monorail that holds the front and rear standards as well as tripod block which can be moved forward or backward to balance the camera on a standard camera tripod. This works great for normal photography where the camera is stationary and, most of the time level. It fails miserably for astrophotography, where the camera is moving and is usually pointing somewhere up in the sky. The camera decides that it wants to point somewhere else while you are trying to line it up on your subject or during tracking. Sometime the shifting can be scary as an expensive camera swings wildly and threatens to fall off the mount.

I tried my first 4x5 astrophoto at Fort McKavett last fall and just could not secure the camera using the tripod block. Chuck Shaw helped me to secure one end of the monorail with a screw and bungee cord and this helped, but the camera still shifted a bit. I needed a more permanent solution.

Figure 2 - Monorail Brace

So, when I got home, I spent a few hours in the workshop with the table saw and other power tools (one of my favorite parts of astrophotography) making a brace. The problem is solved.

Composition

The next problem is composition. During the day, you get to use the focusing cloth and see exactly what you are going to shoot. At night, you can't see what you are looking at. The ground glass dims the view to the point that you can see only a few of the brightest stars. In my attempts, I can't even tell what I'm aiming at. The image is upside-down and backwards and I am never sure of the scale. All I see is a

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few bright stars that I cannot identify. My first attempt was Sagittarius. I missed the whole constellation.

Lots of older cameras have simple viewfinders composed of a circle to look though and a wire frame in which to center the image. I decided I could make something like that. Another few hours in the workshop (power tools – yeah!) and I had a solution. The front standard gets a 4x5 window and the rear standard gets a little circle to position the eye correctly. The distance between the two standards corresponds to the focal length of the lens being used, so the field of view is always fairly accurate.

Figure 3 - View through Viewfinder (OK, so it's a dumb picture)

Focusing

Since I can see bright stars, focusing can be done by simply centering one of those stars and making it as small as possible. This is not always easy as often the camera is pointed at an odd angle causing that neck breaking feeling. Worse, you need to use a loupe to focus the star. So, here you are, kneeling under a large camera, holding a loupe against the glass, trying to get your eye in the right place, and reaching up to turn the focus knobs without losing your balance and falling over. It helps to stick out your tongue.

Still it can be done. It is not easy, though. During my last photo session, I took three pictures. Two were out of focus.

Results

So, finally everything comes together:

I took this shot from "The Observation Deck" on 25 February. I scanned it in at 250 dpi and did no post-processing. The scan looks very similar to the actual transparency—though Barnard's Loop is much easier to see on the original.

Anyway, hopefully this is the first of many. I'll have fun taking them and I hope you all have fun looking at them!

Figure 4 - Orion 4x5 Astrophoto

Deep South Texas Stargaze

Images and text by Charlie McLeod

Even though we were clouded out most nights I still had a great time this year attending the Deep South Texas Stargaze near Freer, Texas on February 22-26. We had a total of about 5 hours of clear skies over 4 nights with most it the first night and some the last night. There were 44 people attending this year. I am finally getting the hang of using a web camera to get some decent planetary shots. Visit: http://www.charliemcleod.com/Astronomy/2006DSTS/2006DSTS.htm to see more images from the star party.

Cynthia Gustava gave her wonderful talk to the group on the "Mysteries of Orion" which she also gave at the last JSCAS meeting. This time she included Glenn Schaeffer's picture of the naked man, it was a hit and drew lots of amusing comments.

Another very interesting talk was presented by Bill Tschumy of the Austin Astronomical Society on the Milky Way. He presented a 3D representation of various deep sky objects in and around the Milky Way. His web site, http://www.thinkastronomy.com/, includes free software that he used during his presentation. The software is called "Where is M13" and is really cool. You can select various Messier objects to plot on a 3D map of the Milky Way. The program is only about 2 MB. He plans on adding other objects in the near future.

Left: Saturn, taken February 22nd with an 8" Meade LX90 at f20, ToUCAM Pro, 1 minute video
Right: Observing Field at Freer, Texas

Did You Know?

According to Richard Nugent, The California Nebula shines by illuminated light from the 4th magnitude star Xi Persei which lies less than 1 degree to the south. Xi Persei also is a very fast moving star (moving at 70 km/sec away from us) and in about 200,000 years, it will have moved well beyond the nebula, thus the nebula will lose most of its illumination.

Xi Persei was ejected from a nearby group of stars recently and its high space motion has taken it (by chance) into the vicinity of the California Nebula. Unlike most bright nebula, whose stars and gas are connected by gravity, the California Nebula has been made visible by the chance encounter with Xi Persei.

JSCAS Star Parties

Lisa Lester

About 5:30 p.m. on Saturday, March 4th, I hurried across the grocery store parking lot. As I climbed into my Expedition I glanced at the sky with growing concern. The skies were gray and cloudy with a few small sucker holes. Shortly after getting on the road I whipped out my cell phone and touched base with Johanna Goforth at Moody Gardens. Her report on the skies there didn't cheer me much. The only positive thing that she could tell me was that the clouds were moving fast. I hung onto the hope that they would blow right out of Galveston as I sped down I 45.

On the trip to Galveston, I alternated between worrying about the weather and worrying about whether I'd be putting on a one telescope star party (and a late one at that since the Sun was setting behind the clouds as I drove!). I knew who was not going to be at Moody Gardens but I did not know of one person who was definitely going to be there! As I neared the causeway bridge, Ken called me from Fort McKavett. His first question was "How many telescopes do you have?" I told him I had no idea, as I wasn't there yet!! Ken cut the conversation off quickly to help me focus on the traffic.

I drove around the conference center at Moody Gardens and pulled into the parking lot peering into the field as I parked. I could see a few people and the silhouette of at least one telescope in the deepening dusk as I parked. A smile started tugging at the corners of my mouth and after I got out and looked up at the sky, the smile turned into a grin! The clouds were there but moving fast and that old faithful bright object, the Moon was shining bright enough to be seen through the clouds. We had at least one object to view!!

I gathered up some equipment for my first trip to the field and almost ran into Matt Hommel and his daughters! Once I got to the field, I saw their scope and I saw Drel and John with their scopes and someone I didn't recognize (Later I found out it was Steve from Santa Fe who recently joined the club). As I went back to my car for trip number two, I spotted more telescope equipment being toted across the field. It turned out to be Walt from Galveston with his big Meade. With 5 scopes, I knew we'd be able to take care of the people who came to observe. I set up quickly and the others finished making adjustments to their scopes as several groups of people hovered by the playground equipment. It was getting cooler as it got darker and the wind was gusting but we had an eager audience so I put my scope on the Moon and hollered at everyone to come look. That's all it took to get the star party started!

The wind did blow the clouds out and we were able to observe the Moon, Saturn, Orion's Nebula, the ET cluster, and a few other things. We had a lot of traffic at first but as the wind stayed gusty & the temperature dropped the traffic died down. Steve and Candy arrived with one of the club scopes

Event	Date	Sun	Moon			Jupiter		Saturn		Mars		Venus	
		Set	Illum.	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
2006													
Haak Winery	Apr 22	19:50	34%	03:32	14:28	20:46	07:39	12:56	02:38	10:36	00:45	04:45	16:23
Texas Star Party	Apr 23 - 30	20:27	23%	04:46	16:12	21:19	08:09	13:25	03:11	11:06	01:22	05:20	16:59
Moody Gardens	Aug26	19:47	7%	09:17	21:18	12:13	23:12	05:40	19:03	08:20	20:45	05:37	19:02
Haak Winery	Sep 23	19:13	1%	08:05	19:48	10:44	21:37	04:05	17:20	07:53	19:45	06:28	18:52
Fort McKavett	Oct 19 - 22	19:02	6%	05:28	17:47	09:48	20:28	02:52	16:08	07:51	19:09	07:35	19:03
Moody Gardens	Oct28	18:35	36%	13:31	23:46	08:59	19:42	02:02	15:12	07:22	18:30	07:30	18:38
Haak Winery	Nov11	17:25	61%	23:17	12:33	07:18	17:54	00:11	13:20	06:12	17:04	06:58	17:38

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and we focused on the few people still on the field and getting familiar with the club scope. About 9:30 the water sprinklers came on across the road and we watched them with concern. Just before 10 p.m. I decided to pack up and some of the others thought they might too in a few minutes. The sounds of sprinklers coming on near the cement slab prompted everyone to pack up quickly! I'll get with Johanna on that concern before our next star party. Some people staying at the hotel and convention center said that if they hadn't come for a walk they would not have known this event was going on. I'll talk to Johanna about getting signs, flyers, or posters in those areas for our next event. I also need to email two families our website information and I must update our club handouts before our next star party.

Thanks so much for everyone's help in making our first star party of 2006 a success! Don't forget that Fort McKavett is March 30th – April 2nd. If you can't make that be sure to put Saturday, April 22nd on your calendar and meet us at the Haak Winery. They are already advertising the event and scheduled weddings around the date that we selected! I know that we'll have a very appreciative group of observers there.

Visual Observing April 2006

Chris Randall

★**SSO: (Solar System Objects)** Summary for the 15 April 06 Highlighted times denote daylight events.

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	Psc	-26.7	100	06:54	13:20	19:46
Moon	Lib	----	95	22:01	02:24	07:48
Mercury	Psc	0.1	59	05:51	11:47	17:43
Venus	Aqr	-4.2	60	04:51	10:34	16:18
Mars	Gem	1.4	92	10:46	17:49	00:57
Jupiter	Lib	-2.5	100	21:18	02:44	08:09
Saturn	Cnc	0.6	100	13:23	20:16	03:05
Uranus	Aqr	5.9	100	05:00	10:45	16:29
Neptune	Cap	7.9	100	03:47	09:13	14:40
Pluto	Ser	13.9	99	00:08	05:33	10:58
C/2005 E2 McNaught	Ari	9.8	98	07:26	14:37	21:53
Schwassmann-	Ser	10.1	91	19:58	03:01	10:04
Pojmanski C/2006 A1	Cas	10.7	88	00:54	11:25	22:00

Lunar phases for March, 2006 (Central Daylight time)

First	Full	Third	New
5th 07:01	13th 11:40	20nd 22:28	27th 14:44

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★**BSO**: (Bright Sky Objects)

NGC 3532 (C-91, Cr 238, Mel 103) - Open Cluster in Car, Magnitude 3.0, Size 55', 150 Stars.
NGC 3114 (Cr 215, Mel 98) - Open Cluster in Car, Magnitude 4.2, Size 35', 171 Stars.
NGC 3293 (Cr 224, Mel 100) - Open Cluster in Car, Magnitude 4.7, Size 5', 93 Stars.
NGC 3766 (C-97, Cr 248, Mel 107) - Open Cluster in Cen, Magnitude 5.3, Size 12', 100 Stars.

★**DSO**: (Dark Sky Objects)

NGC 3132 (C-74, PK 272+12.1) – Planetary Nebula in Vela, Magnitude 8.2(p), Size 88" x 58".
NGC 3242 (C-59, PK 261+32.1) - Planetary Nebula in Hya, Magnitude 8.6(p), Size 75". Gost of Jupiter
NGC 3626 (C-40) - Galaxy in Leo, Magnitude 11.8(b), Size 3.2' x 2.3'.
NGC 4027 (A-22) – Galaxy System in CrV, Magnitude 11.7 (b), Size 2.8' x 2.5'.

★**CDMP:** (Chris' Don't Miss Pick)

NGC 3372 (C-92) Eta Carinae Nebula in Car, Magnitude 3.0(b), Size 120'.

This is one of the most stunning nebulae in the entire sky. It is larger than M42, the Great Nebula in Orion. You might need to get some specialized observing equipment. You are going to have to have a clear southern horizon because at 22:33 local time it at its maximum height of **one** degree. Get a DitchWich!! The nebula, located about 8,500 light years away, is a giant complex of emission and dark nebulae surrounding the unique variable star Eta Carinae. One of the most conspicuous features is the Keyhole Nebula, which is formed by its brightest part and darker material.

The nebula was discovered by Abbe Lacaille during his 2-year journey to the Cape of Good Hope in 1751-52. Lacaille made two catalog entries situated in the region covered by this object: Lac III.5 and Lac III.6, which the elder literature both identifies with NGC 3372. While the description of III.6: "Large group of a great number of small stars, little compressed, and filling out the space of a kind of a semi-circle of 15 to 20 minutes in diameter; with a slight nebulosity widespread in space", matches well with what Lacaille should have seen in his 0.5-inch refractor, he describes III.5 as: "Two small stars surrounded by nebulosity". Ronald Stoyan has found that close to Lacaille's position for this object, there is indeed a small cluster, Collinder 228, which would match Lacaille's description when observed with such a small telescope.

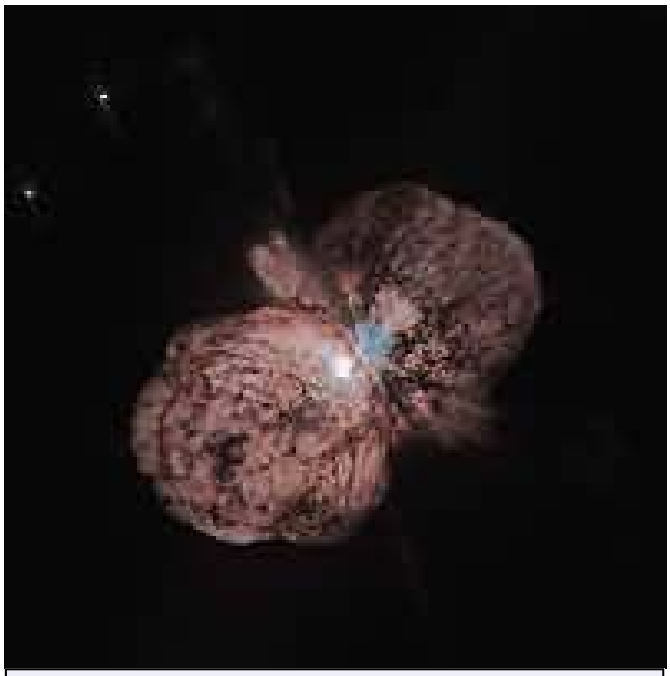

Photo Credit: Jon Morse (University of Colorado), and NASA

This nebula is one of the largest H II regions in our Milky Way galaxy. The star-forming nebula NGC 3372 has produced the very conspicuous peculiar star Eta Carinae, which is among the most massive and luminous stars in our Milky Way, and perhaps in the universe. The star is about 100 times as massive as our own Sun, but produces 6 million times the light output. In the 1840's, Eta Carinae erupted visibly and was the second brightest star in the sky during this time.

Go http://www.seds.org/ or http://www.ngcic.org/ for more information.

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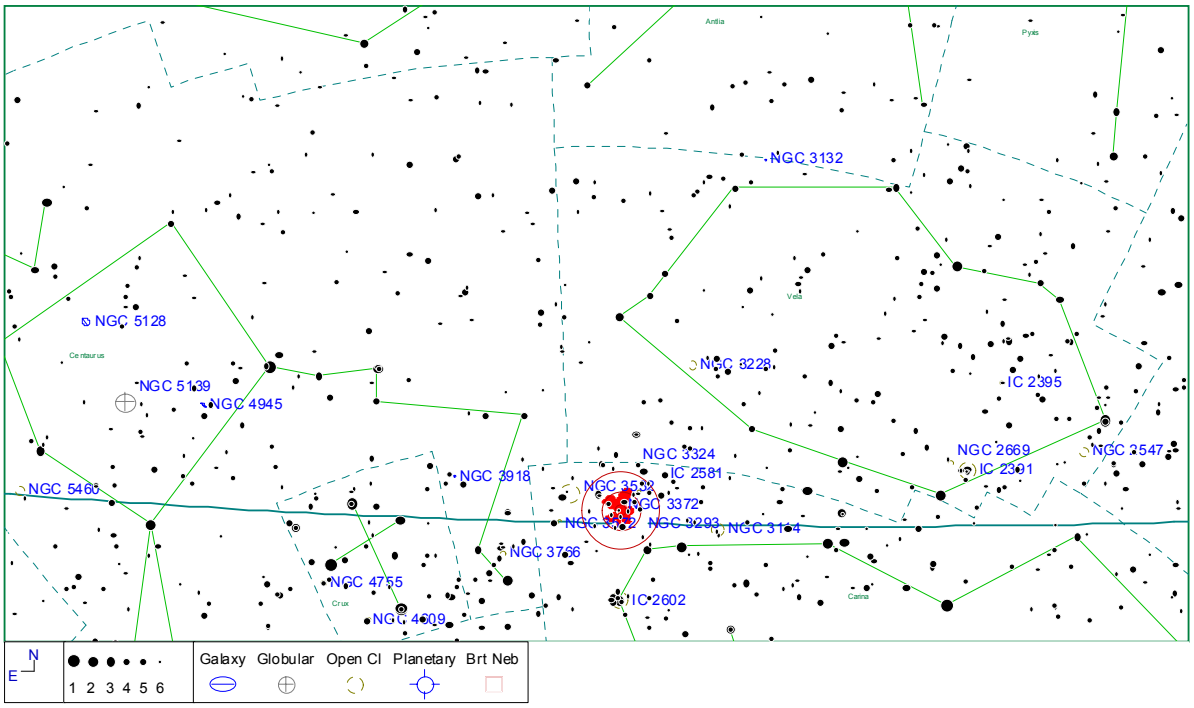

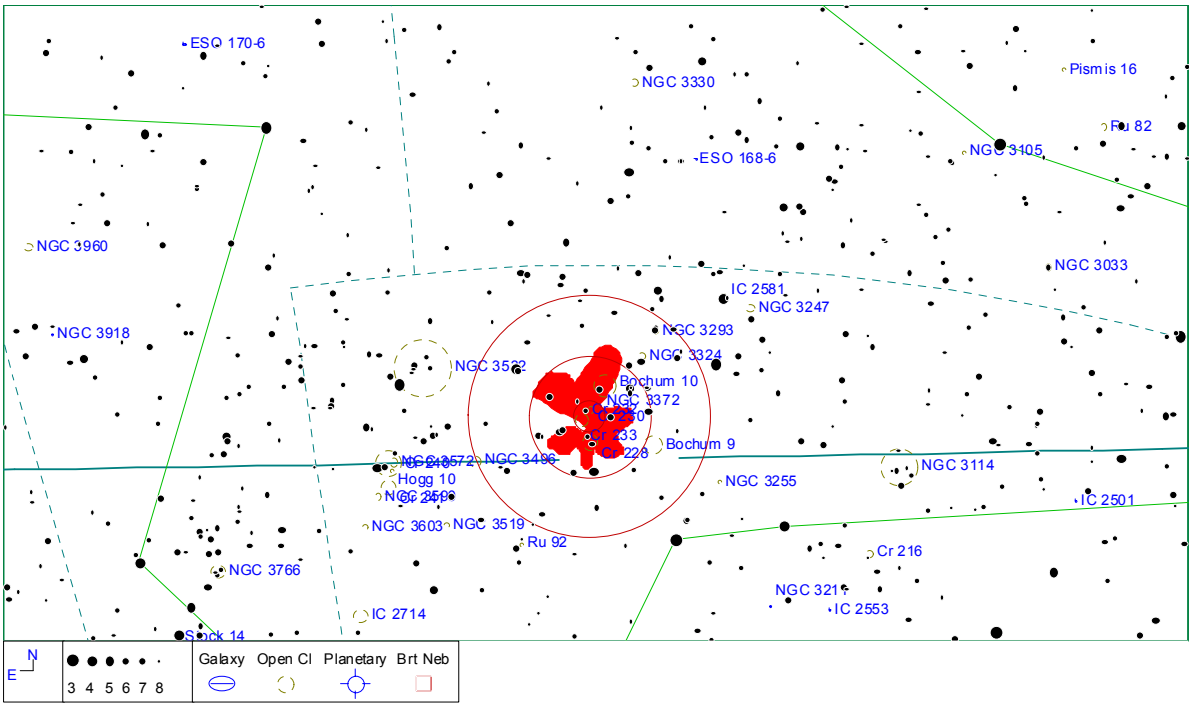

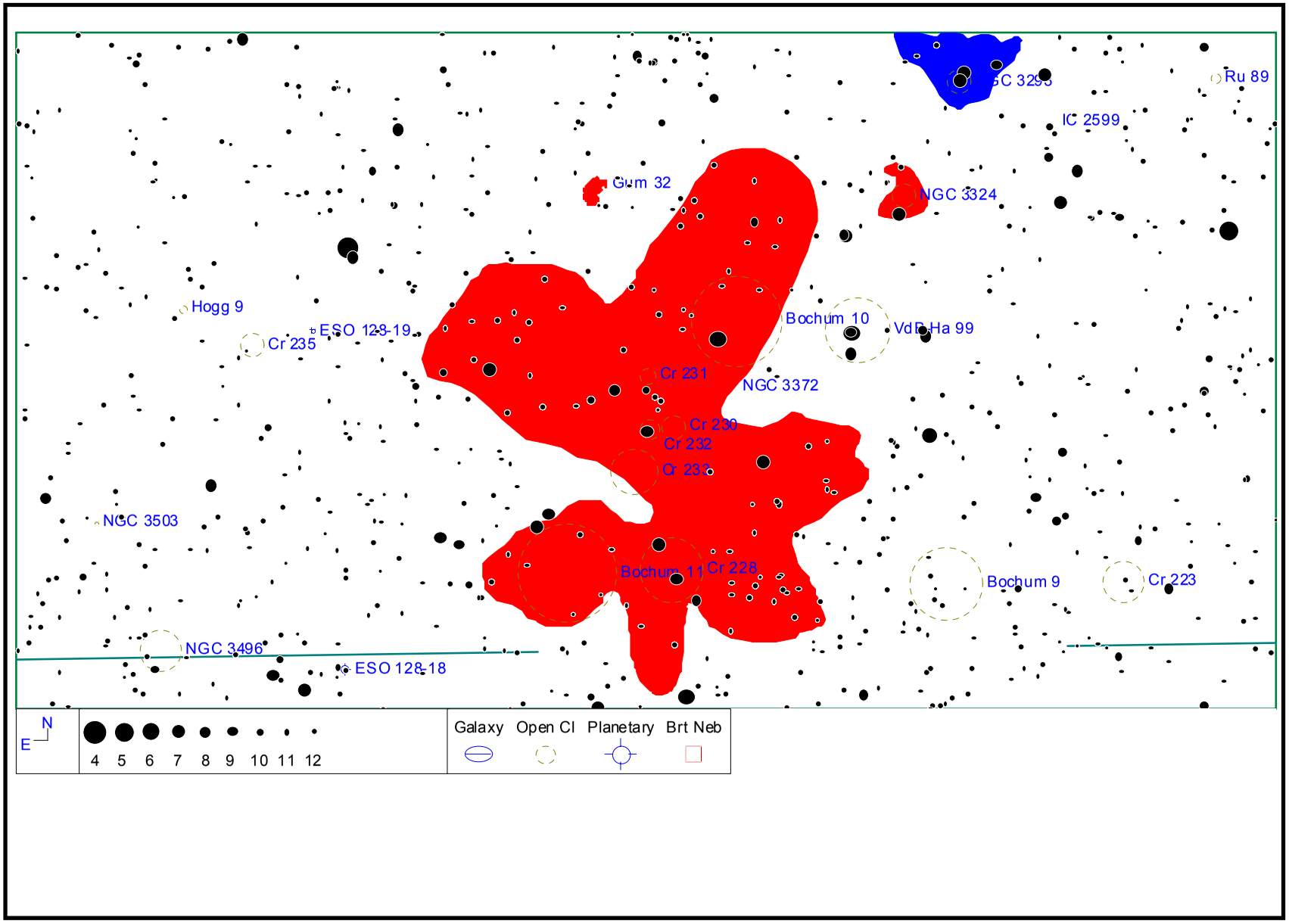
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IC 2599
Gum 32
NGC 3324
Hogg 9
ESO 128-19
Cr 235
Bochum 10
VdB-Ha 99
Cr 231
NGC 3372
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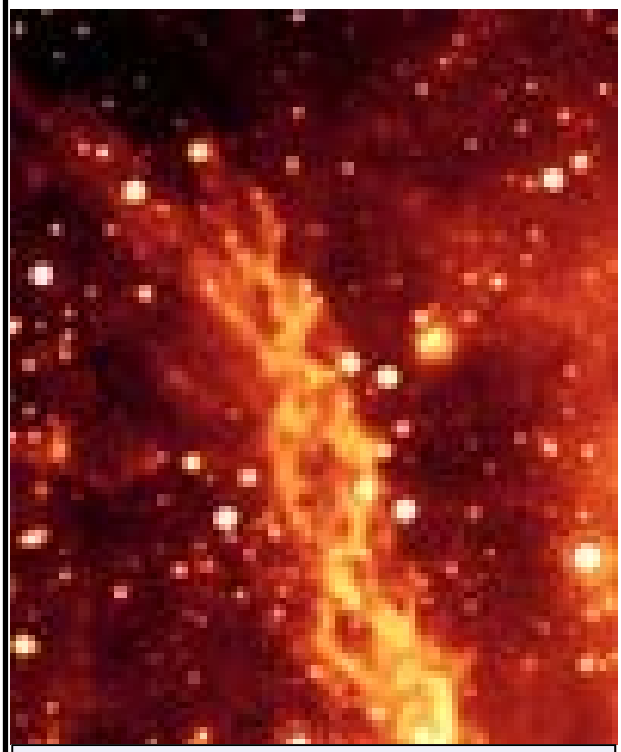
Astronomers Report Unprecedented Double Helix Nebula Near Center of the Milky Way

Date: March 15, 2006
Contact: Stuart Wolpert (swolpert@support.ucla.edu)
Phone: 310-206-0511

Astronomers report an unprecedented elongated double helix nebula near the center of our Milky Way galaxy, using observations from NASA's Spitzer Space Telescope. The part of the nebula the astronomers observed stretches 80 light years in length. The research is published March 16 in the journal Nature.

"We see two intertwining strands wrapped around each other as in a DNA molecule," said Mark Morris, a UCLA professor of physics and astronomy, and lead author. "Nobody has ever seen anything like that before in the cosmic realm. Most nebulae are either spiral galaxies full of stars or formless amorphous conglomerations of dust and gas — space weather. What we see indicates a high degree of order."



Credit: NASA/JPL-Caltech/UCLA

The double helix nebula is approximately 300 light years from the enormous black hole at the center of the Milky Way. (The Earth is more than 25,000 light years from the black hole at the galactic center.)

The Spitzer Space Telescope, an infrared telescope, is imaging the sky at unprecedented sensitivity and resolution; Spitzer's sensitivity and spatial resolution were required to see the double helix nebula clearly.

"We know the galactic center has a strong magnetic field that is highly ordered and that the magnetic field lines are oriented perpendicular to the plane of the galaxy," Morris said. "If you take these magnetic field lines and twist them at their base, that sends what is called a torsional wave up the magnetic field lines. "You can regard these magnetic field lines as akin to a taut rubber band," Morris added. "If you twist one end, the twist will travel up the rubber band."

Offering another analogy, he said the wave is like what you see if you take a long loose rope attached at its far end, throw a loop, and watch the loop travel down the rope.

"That's what is being sent down the magnetic field lines of our galaxy," Morris said. "We see this twisting torsional wave propagating out. We don't see it move because it takes 100,000 years to move from where we think it was launched to where we now see it, but it's moving fast — about 1,000 kilometers per second — because the magnetic field is so strong at the galactic center —

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about 1,000 times stronger than where we are in the galaxy's suburbs."

A strong, large-scale magnetic field can affect the galactic orbits of molecular clouds by exerting a drag on them. It can inhibit star formation, and can guide a wind of cosmic rays away from the central region; understanding this strong magnetic field is important for understanding quasars and violent phenomena in a galactic nucleus. Morris will continue to probe the magnetic field at the galactic center in future research.

This magnetic field is strong enough to cause activity that does not occur elsewhere in the galaxy; the magnetic energy near the galactic center is capable of altering the activity of our galactic nucleus and by analogy the nuclei of many galaxies, including quasars, which are among the most luminous objects in the universe. All galaxies that have a well-concentrated galactic center may also have a strong magnetic field at their center, Morris said, but so far, ours is the only galaxy where the view is good enough to study it.

Morris has argued for many years that the magnetic field at the galactic center is extremely strong; the research published in Nature strongly supports that view.

The magnetic field at the galactic center, though 1,000 times weaker than the magnetic field on the sun, occupies such a large volume that it has vastly more energy than the magnetic field on the sun. It has the energy equivalent of 1,000 supernovae.

What launches the wave, twisting the magnetic field lines near the center of the Milky Way? Morris thinks the answer is not the monstrous black hole at the galactic center, at least not directly.

Orbiting the black hole like the rings of Saturn, several light years away, is a massive disk of gas called the circumnuclear disk; Morris hypothesizes that the magnetic field lines are anchored in this disk. The disk orbits the black hole approximately once every 10,000 years.

"Once every 10,000 years is exactly what we need to explain the twisting of the magnetic field lines that we see in the double helix nebula," Morris said.

SSC Astronomer Discovers a River of Stars

March 15, 2006

An artist's concept of the river of stars.
Credit: NASA/JPL-Caltech/T. Pyle (SSC)

The California Institute of Technology announced today (March 15) that a team of astronomers, led by Carl Grillmair of the Spitzer Science Center, has discovered a narrow stream of stars extending at least 45 degrees across the northern sky.

The stream is about 76,000 light-years distant from Earth and forms a giant arc over the disk of the Milky Way galaxy. It begins just south of the bowl of the Big Dipper and continues in an almost straight line to a point about 12 degrees east of the bright star Arcturus in the constellation Bootes. The stream emanates from a cluster of about 50,000 stars known as NGC 5466.

The newly discovered stream extends both ahead and behind NGC 5466 in its orbit around the galaxy. This is due to a process called tidal stripping, which results when the force of the Milky Way's gravity is markedly different from one side of the cluster to the other. This tends to stretch the cluster, which is normally almost spherical, along a line pointing towards the galactic center

A Shocking Surprise in Stephan's Quintet

This false-color composite image of the Stephan's Quintet galaxy cluster clearly shows one of the largest shock waves ever seen (green arc), produced by one galaxy falling toward another at over a million miles per hour. It is made up of data from NASA's Spitzer Space Telescope and a ground-based telescope in Spain.

Four of the five galaxies in this image are involved in a violent collision, which has already stripped most of the hydrogen gas from the interiors of the galaxies. The centers of the galaxies appear as bright yellow-pink knots inside a blue haze of stars, and the galaxy producing all the turmoil, NGC7318b, is the left of two small bright regions in the middle right of the image. One galaxy, the large spiral at the bottom left of the image, is a foreground object and is not associated with the cluster.

The titanic shock wave, larger than our own Milky Way galaxy, was detected by the ground-based telescope using visible-light wavelengths. It consists of hot hydrogen gas. As NGC7318b collides with gas spread throughout the cluster, atoms of hydrogen are heated in the shock wave, producing the green glow.

Spitzer pointed its infrared spectrograph at the peak of this shock wave (middle of green glow) to learn more about its inner workings. This instrument breaks light apart into its basic components. Data from the instrument are referred to as spectra and are displayed as curving lines that indicate the amount of light coming at each specific wavelength.

The Spitzer spectrum showed a strong infrared signature for incredibly turbulent gas made up of hydrogen molecules. This gas is caused when atoms of hydrogen rapidly pair-up to form molecules in the wake of the shock wave. Molecular hydrogen, unlike atomic hydrogen, gives off most of its energy through vibrations that emit in the infrared.

This highly disturbed gas is the most turbulent molecular hydrogen ever seen. Astronomers were surprised not only by the turbulence of the gas, but by the incredible strength of the emission. The reason the molecular hydrogen emission is so powerful is not yet completely understood.

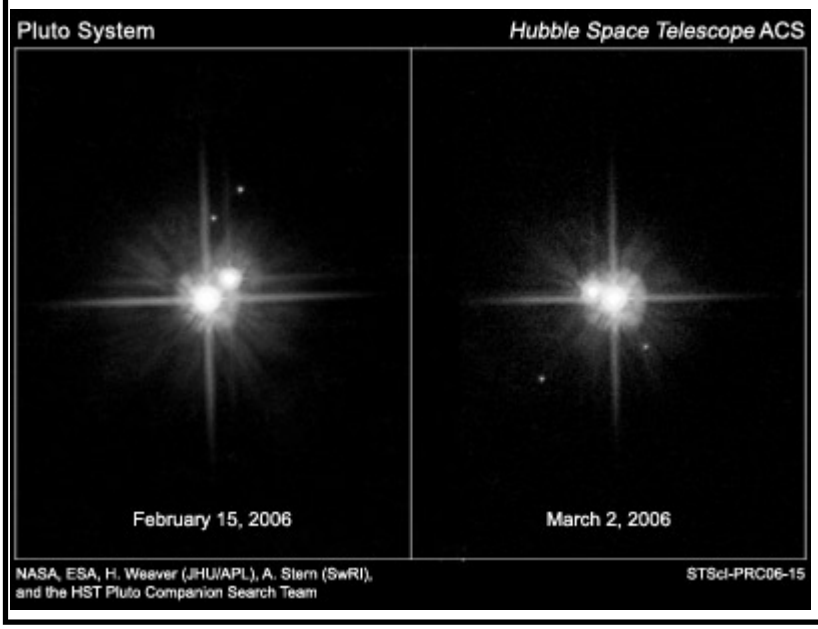
Stephan's Quintet is located 300 million light-years away in the Pegasus constellation.

This image is composed of three data sets: visible red light (blue) and visible light called H-alpha (green) from the Calar Alto Observatory in Spain, operated by the Max Planck Institute in Germany; and 8-micron infrared light (red) from Spitzer's infrared array camera.

Hubble's Latest Look At Pluto's Moons Supports A Common Birth

Photo Number: STScI-PRC06-15

The latest NASA Hubble Space Telescope images of Pluto's two newly discovered satellites reveal that the new moons have the same color as Charon. All three of Pluto's satellites reflect the Sun's light equally across the visible spectrum and have essentially the same color as Earth's moon. Pluto, in contrast, has a reddish hue. The common color of the moons further reinforces the idea that all three moons were born from a single titanic collision between Pluto and another similarly sized Kuiper Belt object billions of years ago. The color exposures were made on March 2nd in both red (F606W) and blue (F435W) filters using Hubble's Advanced Camera for Surveys. The Pluto team hopes to make further observations in more color filters to more precisely characterize the moons.



Years of Observing Combined Into Best-Yet Look at Mars Canyon

IMAGE ADVISORY: 2006-035

March 13, 2006

A new view of the biggest canyon in the solar system, merging hundreds of photos from NASA's Mars Odyssey orbiter, offers scientists and the public an online resource for exploring the entire canyon in detail.

This canyon system on Mars, named Valles Marineris, stretches as far as the distance from California to New York. Steep walls nearly as high as Mount Everest give way to numerous side canyons, possibly carved by water. In places, walls have shed massive landslides spilling far out onto the canyon floor.

A simulated fly-through using the newly assembled imagery is available online at; http://www.nasa.gov/mission_pages/mars/missions/odyssey/20060313.html .

The fly-through plus tools for wandering across and zooming into the large image are at; http://themis.asu.edu .

"We picked Valles Marineris to make this first mosaic because it's probably the most complex, interesting feature on the entire planet," said Dr. Phil Christensen of Arizona State University,

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Tempe. He is the principal investigator for Mars Odyssey's versatile camera, the Thermal Emission Imaging System. "To understand many of the processes on Mars -- erosion, land sliding and the effects of water -- you really need to have a big-picture view but still be able to see the details."

Small parts of the canyon have been seen at higher resolution, but at 100 meters (328 feet) per pixel, the new view has sharper resolution than any previous imaging of the entire canyon.

In addition to the completed mosaic of Valles Marineris images, the camera team has also prepared an online data set of nearly the entire planet of Mars at 232 meters (760 feet) per pixel, the most detailed global view of the red planet. The team plans to post 100-meter-resolution mosaics of other regions of Mars in coming months.

NASA/JPL-Caltech/C. Engelbracht (University of Arizona)

Galaxy on Fire! NASA's Spitzer Reveals Stellar Smoke

News Release: 2006-037
March 16, 2006

Where there's smoke, there's fire – even in outer space. A new infrared image from NASA's Spitzer Space Telescope shows a burning hot galaxy whose fiery stars appear to be blowing out giant billows of smoky dust.

\The galaxy, called Messier 82, or the "Cigar galaxy," was previously known to host a hotbed of young, massive stars. The new Spitzer image reveals, for the first time, the "smoke" surrounding those stellar fires.

"We've never seen anything like this," said Dr. Charles Engelbracht of the University of Arizona, Tucson. "This unusual galaxy has ejected an enormous amount of dust to cover itself with a cloud brighter than any we've seen around other galaxies."

The false-colored view, online at http://www.spitzer.caltech.edu/Media, shows Messier 82, an irregular-shaped galaxy positioned on its side, as a diffuse bar of blue light. Fanning out from its top and bottom like the wings of a butterfly are huge red clouds of dust believed to contain a compound similar to car exhaust.

The smelly material, called polycyclic aromatic hydrocarbon, can be found on Earth in tailpipes, barbecue pits and other places where combustion reactions have occurred. In galaxies, the stuff is created by stars, whose winds and radiation blow the material out into space.

"Usually you see smoke before a fire, but we knew about the fire in this galaxy before Spitzer's infrared eyes saw the smoke," said Dr. David Leisawitz, Spitzer program scientist at NASA Head-

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quarters in Washington.

These hazy clouds are some of the biggest ever seen around a galaxy. They stretch out 20,000 light-years away from the galactic plane in both directions, far beyond where stars are found.

Previous observations of Messier 82 had revealed two cone-shaped clouds of very hot gas projecting outward below and above the center of galaxy. Spitzer's sensitive infrared vision allowed astronomers to see the galaxy's dust.

"Spitzer showed us a dust halo all around this galaxy," said Engelbracht. "We still don't understand why the dust is all over the place and not cone-shaped."

Cone-shaped clouds of dust around this galaxy would have indicated that its central, massive stars had sprayed the dust into space. Instead, Engelbracht and his team believe stars throughout the galaxy are sending off the "smoke signals."

Messier 82 is located about 12 million light-years away in the Ursa Major constellation. It is undergoing a renaissance of star birth in its middle age, with the most intense bursts of star formation taking place at its core. The galaxy's interaction with its neighbor, a larger galaxy called Messier 81, is the cause of all the stellar ruckus. Our own Milky Way galaxy is a less hectic place, with dust confined to the galactic plane.

Mars Rovers Get New Manager During Challenging Period

News Release: 2006-039
March 17, 2006

NASA's long-lived Mars rovers demand lots of care as they age and the Martian winter approaches.

Dr. John Callas, newly named project manager for NASA's Mars Exploration Rover mission, is coordinating the work to meet these challenges. He is a scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif. He was named project manager after earlier roles as science manager and deputy project manager for the Spirit and Opportunity rovers.

"It continues to be an exciting adventure with each day like a whole new mission," Callas said. "Even though the rovers are well past their original design life, they still have plenty of capability to conduct outstanding science on Mars. The JPL operations team and the remote science team working on the project are the best in the solar system at what they do. It is a pleasure and a privilege to lead such an outstanding team and great mission."

One of Spirit's six wheels has stopped working. Dragging that wheel, the solar-powered rover must reach a slope where it can catch enough sunshine to continue operating during the Martian winter. The period of minimum sunshine is more than 100 days away, but Spirit gets only enough power for about one hour per day of driving on flat ground. And the supply is dropping fast.

Spirit's right-front wheel became a concern once before, when it began drawing unusually high current five months after the January 2004 landing on Mars. Driving Spirit backwards redistributed lubricant and returned the wheel to normal operation. This week, during the 779th Martian day of what was originally planned as a 90-Martian-day mission, the motor that rotates that wheel stopped working.

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"It is not drawing any current at all," said JPL's Jacob Matijevic, rover engineering team chief. One possibility engineers are considering is that the motor's brushes, contacts that deliver power to the rotating part of the motor, have lost contact. The motors that rotate Spirit's wheels have revolved more than 13 million times, far more than called for in the rovers' design.

Spirit's solar panels have been generating about 350 watt-hours of electricity daily for the past week. That is down about 15 percent since February and less than one-half of their output during the Martian summer.

The best spot for Spirit is the north-facing side of "McCool Hill," where it could spend the southern-hemisphere winter tilted toward the sun. Spirit finished studying a bright feature called "Home Plate" last week and is driving from there toward the hill. It has approximately 120 meters (about 390 feet) to go. Driving backwards with the right-front wheel dragging, the rover needs to stop and check frequently that the problem wheel has not snagged on anything and caused other wheels to slip excessively. Expected progress is around 12 meters (40 feet) per day under current conditions.

Opportunity is closer to the equator, so does not need to winter on a slope like Spirit. Opportunity spent most of the past four months at "Erebus Crater." It examined layered outcrops, while the rover team determined and tested a strategy for dealing with degraded performance by a motor in the shoulder of its robotic arm. Opportunity left Erebus this week and is on a 2 kilometer (1.2 mile) journey to a giant crater called "Victoria."

Callas has worked on the Mars rovers' mission since 2000 and five other Mars missions since joining JPL in 1987. He succeeds Jim Erickson, who switched to a leadership role with NASA's Mars Reconnaissance Orbiter. Callas grew up near Boston and graduated from Tufts University, Medford, Mass. He earned his doctorate in physics from Brown University, Providence, R.I.

Upcoming Events

2006 Texas Star Party will be held April 23rd through 30th at the Prude Ranch. Visit their web site at : http://www.texasstarparty.org/ for more information.

Dates for the **23rd Annual Okie-Tex Star Party** have been announced. Astronomers will return to Camp Billy Joe on September 16th through 23rd. For more information visit http://www.okie-tex.com/.

Sky & Telescope and 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 $34 a year. We need to have a minimum of five subscribers to take advantage of the discount. 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

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."

Visit the homepage of the Texas IDA affiliate of the International Dark-Sky Association. Their web site is at: http://www.texasida.org/.

Member Recognition

Astronomy Today, http://www.astronomytoday.com launched a new CCD section on February 1st. To get the ball rolling they have a few recent images from **Al Kelly** including M 65 that appears in this month's Member's Gallery.

Comet 73/P Schwassmann-Wachmann

The following information was obtained from the HAS list server as posted by Don Pearce on March 27th.

Currently, fragment "C" is about 10.5 magnitude, while "B" is about 13.5. Four more fragments have been discovered from the 1995 breakup, bringing the (current) total to 13 comets in this array. It should be noted that the brightest of the other fragments is about 17.5 and the drop-off from there is pretty steep. Nevertheless, when this cometary armada reaches perigee at only a little over 7 million miles around May 11th, images should yield quite a sight. At that time, "C" may attain 3rd magnitude. On the night of May 7th "C" will pass only 1.4 arc minutes from M-57, the Ring.

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

MEMBER'S GALLERY

NGC 2292, 2293, and 2295◄
©Al Kelly

Taken with the 32" scope at Danciger March 1st. Three-galaxy cluster comprising NGCs 2292, 2293, and 2295 in southern Canis Major. These were grabbed about 25-30 degrees above the horizon. Image consists of a total of 28 minutes unfiltered and 16, 12, 20 minutes in R:G:B stacked. All individual exposures were 240 seconds and were binned 2x2. According to the NED, 2292 and 2293 are interacting at about 65 Mly and 2295 (the edge on) is their near neighbor at about 60 Mly.

M 65▼
©Al Kelley

Taken with the 32" scope at Danciger March 1st. M 65 is one of the Leo Triplet, a three-galaxy cluster comprising M65, M66 and NGC 3628 in Leo. The image is a composite of a total of 16 minutes unfiltered and 6, 4.5, 7.5 minutes in R:G:B stacked. Individual exposures in luminance were 4 minutes while all filtered images were 90 seconds. All images were binned 2x2. According to Al, "By 11pm last night it was sopping wet at Danciger (95% humidity), but remained dark and clear. By 1:00 I was sure I could hear raindrops, but finally found that the secondary cage was dripping condensation on the deck!"

Ring Around The Moon►
©Kelley Knight

A quick shot of the Moon as the clouds rolled in was able to capture the 22° ring formed by ice crystals.

M82▼
©Chris Wells

Taken March 24th, 2006 at Danciger Texas using a Celestron C8 on a PM1 Equatorial Mount. L/RGB image is a composite from 15 clear, 5 red, 5 green, and 8 blue images. Each individual image was unguided and unbinned at 1 minute duration.

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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April Meeting Agenda

April 14th, 7:30 p.m., Center for Advanced Space Studies/ Lunar Planetary Institute, 3600 Bay Area Blvd. (at Middlebrook Drive).

- Welcome!!!
- Guest Speaker: To Be Announced
- Break
- SIG reports, Star Party News
- Astronomical Oddities — Hernan Contreras
- Last Words, Door Prizes

Any unfinished discussions can be continued over food and beverages at a location to be announced at the end of the meeting.

Starscan Submission Procedures

Original articles of astronomical interest will be accepted up to 6 P.M. April 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.

Starscan Staff

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Cover Image
NGC 6231—False Comet
Credit: Shane Ramotowski

Taken in May, 2003 at the Texas Star Party, this image of the False Comet in Scorpius was taken with a Nikkor 300 mm f2.8 lens at f4 using 35mm Fuji Provia 400 Slide Film. Total exposure time was 10 minutes.