STARSCAN

Johnson Space Center Astronomical Society

VOLUME 22, NUMBER 7

July 2006

IN THIS ISSUE

Top Stories and Special Interest Reports

In the News

Club News and Information

Refurbishing NASA's 16" Apollo Era Telescope

Andy (Yoda) Saulietis

Well, the JSC 16" SCT, mount, parts, and accessories have finally arrived; about 3800 lbs of stuff in 5 large pallets/crates.

My contract starts June 29th and runs thru the end of the fiscal year. The scope will be operational both here and thru the Internet at JSC and hopefully by some JSCAS members.

Chuck Shaw is heavily involved. There will be 3 scopes, a 6" APO refractor, a 16" JSC SCT, and the 37" Newtonian, all networked together.

I'll be sending weekly activity 'reports' and articles for the newsletter.

Any help/participation would be appreciated.

Yoda

Member Recognition

Randy Brewer's image of the galactic pair NGC 4631 and NGC 4627 appeared in Astronomy Magazine's emailed *Astronomy Newsletter* dated June 21, 2006.

6th Annual Regional Meeting Astronomy Day 2006
Organizational Meeting - Thursday, June 1, 2006

A-Day Committee (Coordinators) 2006:

ASSET – Bill Christian, Linda Christian, Howard Minor
FBAC – Cynthia Gustava, Dennis Borgman, Leonard Ferguson
HAS – Bill Leach, Bob Rogers (A-Day webmaster)
HMNS/GO – Barbara Wilson, Peggy Halford, Hannah Lange
JSCAS – Bob Taylor, David Haviland, Connie Haviland, John Cavuoti, Ed Malewitz
NHAC – Juan Carlos Reina, Lorrie Patel, Robert McMillan (A-Day treasurer)

Regional Meeting

Location: Houston Community College

Host: North Houston Astronomy Club

Date and Time: Friday, October 27, 2006, 8:00 – 10:15 p.m.

Astronomy Club Representatives:

ASSET=Bill Christian
FBAC=Dennis Borgman
JSCAS=Bob Taylor
NHAC=Juan Carlos Reina
HAS=Steve Sartor
George Observatory: Barbara Wilson

Coordinators:

Agenda Coordinator – Bill Leach
Set-Up Coordinator – Ken Miller
Refreshments Coordinator – Susan Kennedy
A/V Room Coordinator – JC Reina (JC Reina will also produce the program)
Door Prize Coordinator – Lorrie Patel, Cynthia Gustava (LS&S)
T-shirt Coordinator – Bill Leach

T-Shirts: Color-soft yellow, words-denim blue, image-Neptune; 100% cotton; XXXL-4, XXL-12, XL-30, L-30, M-10, S-10 = 8doz sold at $20/each. (2006 is 150th year since Neptune was discovered.)

Astronomy Day – Place: George Observatory

Date and Time: Saturday, October 28, 2006, 3:00 – 10:30 p.m. Stop ticket handout for Research Dome at 10:00 p.m. First Quarter Moon Rises at 1:36 p.m., Sets at 11:52 p.m. – Note: Sunday Oct 29 DST ends.

Managers and Coordinators:

Building Managers – Cynthia Gustava, Keith Rivich
Challenger Center Manager – Peggy Halford, Hannah Lange
Store Manager – Hannah Lange, Gift Shop Sales (TBD)
Speaker Scheduling Coordinator – Bill Leach
Indoor Speaker Coordinator – JC Reina, Geraldina Reina

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Outdoor Speaker Coordinator – Bob Taylor (FBAC can provide a speaker, Leonard Ferguson, on the new Stanford University Sudden Ionospheric Disturbance exhibit at the George. Will need to find out if Leonard can pull the solar weather monitor off the roof of the Challenger Center.

Volunteer Food Coordinator – Lorrie Patel. Bill Leach will bring WD40 for ice chest hinges.

Public Food Vendor Coordinator – John Cavuoti. Will move pizza stand in closer where port-a-potties used to be.

Webmaster – Bob Rogers. Bill Leach and Cynthia Gustava will coordinate with Bob Rogers as to what is on the website. Need input sooner this year! Bill Leach will look at what we need to do to keep the URL astronomyday.org…it is active now with 2005 pictures.

Treasurer – Robert McMillan

Make donation checks out to "NHAC" and send to:
North Houston Astronomy Club
c/o Kingwood College Physics Department
20000 Kingwood Dr.
Kingwood TX 77339

Domes Coordinator – Cynthia Gustava

Deck Coordinator – Cynthia Gustava. James Wooten will do green laser tours

Gate Security Coordinator – Leonard Ferguson and FBAC Members

Loading/Unloading Coordinator – Wes Whiddon (if available), Dennis Borgman, FBAC

Kid's Activities Coordinator – JSCAS. Hannah Lange will purchase glitter, silver/gold, and face paint for outside face-painting. Bill Leach will purchase astronomy button blanks. LPI will have outside comet-making table.

Hall / Foyer Display Coordinators –

Bill Christian, Set-up tables/chairs, power.
Bill Leach (city map, linen table cloths)
Lorrie Patel (painter's tape)
Mike Dye, George Observatory (extension cords)

Ticket Distribution Coordinator – Paul Halford, Cynthia Gustava. 36" tickets, door prize registration/survey handout, DEET station, program/map handout. – Bill Leach will bring DEET. Cynthia Gustava will bring cheap pens for survey completion; 1 survey card per adult.

A-Day Program/Map – JC Reina

Volunteer Assignments Coordinator – Cynthia Gustava. Excel spreadsheet

Sunday Clean-Up Coordinator – Barbara Wilson, Dennis Borgman, Cynthia Gustava. Try to make this minimal by cleaning up as much as possible on Saturday night

Promotions Coordinator – Bill Leach. September e-mail blast to the schools. Cynthia Gustava to write an article for Sky & Telescope and Astronomy magazines. Betty Glass as HISD/HMNS liaison, to get HMNS to help.

Handouts/Door Prize Coordinator – Bill Leach. To talk with Steve Goldberg about a Meade telescope door prize [18 and over] and develop survey/registration form to win telescope.

Sign Coordinator – Bill Leach. Get program signs for the walk to the observatory and two promotional signs for the George that can be put up now. Cynthia Gustava to makecolor signs for George and larger "QUIET" sign for outside lecture room door. Bill Christian to bring marker board for indoor talks marquis. JC Reina to produce an Astronomy Day program. Cynthia Gustava to bring easel and pad.

Name Tags Coordinator – Bill Leach

New this year: No food will be allowed in the indoor talks. Howard Minor can do a "kid's" presentation on telescopes using a cut-away scope from Kingwood College. Bill Leach will obtain a kid's door prize for this event.

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Suggestions for Improvement from 2005:

Signs for “Face Painting”, “Astronomy Buttons”, “Comet Making”… (Bill Leach???)
Hand map of activity locations (Paul Halford will give out when they pay)
Program signs on walkway (Bill Leach)
Tablecloths for hallway (will be linen this year – Bill Leach)
Individual club tables (will have two tables this year under club and observatory logos)
Public food on premise (John will position vendor in where port-a-potties used to be)
Volunteer menu changes (wanted less beef and more veggies – have bowls for veggies)
Recruit speakers earlier
More deck telescopes needed (weather permitting)
Distribution of freebies (will be at club’s tables this year)
Door prizes for regional meeting (each club to bring 4-5 – no $$$ limit)
Use of astronomy day organizers discussion group (make use of Yahoo group)
More t-shirts, sizes (resolved)
Trash cans / cigarette containers on main deck (Keith Rivich and Cynthia Gustava)
Mark out overflow parking early (not necessary – asphalt has been laid down. Hannah Lange to ask if lines will be painted before October.)
RV site reservations (reservations need to be made in October of 2006 for October of 2007)
More gold and silver glitter (Hannah Lange to buy along with face paint)
Get website operating earlier (This is dependent on input!!! – We need to get it in early.)
Spring regional activity (Bill Leach will coordinate with Ed Malewitz for 2007 – too late for 2006)
All volunteers need to sign-in on the computer (put nametags near computer and require nametag to get food – Food to be set up in back room again.)
We will have only three kid’s activities this year: Comet-making (LPI), Button-making and face-painting – plus the half-hour kids’ inside talk/demonstration on telescopes by Howard Minor. As noted above, there will be a drawing for a kids’ prize in this talk. Bill Leach will provide cut-away 8” scope for this talk.)

Budget Commitments:

NHAC - $200
HAS - $400
KWC - $400
FBAC - $200
ASSET - $75
JSCAS - $150
HMNS/GO - $200
T-shirt sales - $1,200
Account Credit - $100
Total: $2,925

Expected expenditures: Total ~ $2400
Meeting speaker - $1,000 (Possibilities are Steve Squyres, Carolyn Porco or Head of NASA)
Meeting Refreshments - $300
Meeting Program – N/C
Meeting Speaker Gift - $100
A-Day Volunteer Food - $600
A-day Name Tags - $25
Signs - $200
Astronomy Buttons - $100 (May need to collect more magazines)
Face paint/glitter - $75

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General Discussion at Coordination Meeting on June 1, 2006:

Dennis Borgman:	How do we get some recognition of clubs and major players by astronomy publications? Our A-Day is different from the National Astronomy Day.
Cynthia Gustava:	To write articles for Astronomy Magazine, Sky&Tel, Night Sky (?), Reflector (?) – will need to find out when these publications close out their issues for more articles.
Dennis Borgman:	Stop RD dome viewing earlier this year since we can start so early showing the Moon.
Hannah Lange:	Will ask about gate being open till midnight and when lines will be painted on new asphalt parking lot near interpretive center.
Cynthia Gustava:	What should we do about the Ham Radio setup? Input from everyone that there was not much interest in it last year, so will not have this in 2006.
Cynthia Gustava:	Club newsletters/websites need to announce Regional Meeting and A-Day well in advance. Cynthia will get article into the HMNS Dashing Diplodocus.

Extra Notes for Consideration:

Bill, can we add a note to the email blast and postcards that if they bring the email/postcard to A-Day activities at the George, they are "automatically eligible to sign up for a drawing for a FREE Meade telescope" … or something along those lines? We need a way to let them know there is something to win so that they will drive down there.

Also, we did not discuss whether the public is invited to the Regional Meeting. I believe we only had two people show up last year, even with all the advertising about "open to the public." In my opinion, this night should be for the volunteers and club members. That was my intent when I first thought up this Regional Meeting. If the public shows up and wins one of the door prizes (unless we exclude them from that and then they will feel bad) then will our volunteers/members feel "they haven't done anything for these clubs…why should they win something?"

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

JSCAS Supports Fort McKavett SHS

Ken Lester

Buddy Garza and the staff at Fort McKavett State Historical Site have been very generous to JSCAS. Twice a year for eight years now, JSCAS has been invited to spend Thursday through Sunday camped out under the stars on the fort's parade ground observing the heavens.

The walls go up

Now that I'm on the staff at the fort, I have insider knowledge of the amount of effort that it takes to prepare for the JSCAS trips. These preparations include grounds maintenance, building cleanup, porta-pottie cleaning, food purchasing, as well as food preparations.

In March, our president, Bob Taylor, mentioned to Buddy that he would like to repay his generosity by coming out to the fort to perform whatever service projects were needed. Bob set a June 5th starting date then sent out a list server message attempting to recruit additional JSCAS manpower to join him.

Mike Street and Bob attaching the siding

Meanwhile, Buddy and I discussed what would be the ideal project for JSCAS. It was decided that building an additional bathroom next to the showers at the maintenance building would benefit JSCAS, the Living Historians, and many other activities that go on at the fort.

The response to Bob's recruiting efforts didn't exactly turn out as Bob had planned. With the exception of Jim Cate, early June was just not convenient for our club members to come out to the fort. As an alternative, our members opened their pocket books and contributed a substantial amount to defray the cost of building materials. JSCAS donated a total of $455 to the Friends of Fort McKavett for the project.

Bob checks to be sure the building is level

Bob arrived Sunday night and was ready to start bright and early Monday morning. Jim Cate showed up on Tuesday. The construction team consisted of JSCAS members Bob, Jim, myself and Mike Street (a JSCAS member from Sonora) and park ranger Alfredo Muñoz.

The building went up very quickly. By the time I returned Tuesday afternoon from the Lowe's in San Angelo with the new toilet, the last of the metal siding was being attached. By Wednesday, the

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Bob models the latest in fashion headgear

hottest day of the year so far (103°F), the job was complete except for wiring the lights.

The new restroom as a very large sink with hot and cold running water, mirror, trash can, as well as a flush toilet.

I know that this new facility will come in handy come October during our next fort star party. Buddy was very impressed with our effort and is quick to point out the new facilities to the volunteers and historians who come by. He asked that I express his gratitude to the club for supporting the fort.

Jim and Alfredo test fit the door

Kids, don't try this at home

All the amenities of home, even a roof!

Star Party News

Ken Lester

Our next star party will be at Moody Gardens on August 26th.

Event	Date	Sun Set	Moon			Jupiter		Saturn		Mars		Venus	
			Illum.	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
2006													
Moody Gardens	Aug 26	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
Astronomy Day	Oct 28	18:35	36%	13:31	23:46	08:59	19:42	02:02	15:12	07:22	18:30	07:30	18:38
Moody Gardens	Oct 28	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	Nov 11	17:25	61%	23:17	12:33	07:18	17:54	00:11	13:20	06:12	17:04	06:58	17:38

Piloting the Vomit Comet

Triple Nickel

I thought you might enjoy these photos of our new DC-9 that we use for zero gravity flights.

We start out at about 24,000' and at our maximum airspeed of just under 350 knots, at which time we pull the nose up until the airspeed drops below 250 knots. We then start the "push over" which creates the floating or zero g in the cabin. We get up to about 50 degrees nose up and then end up about 50 degrees nose down before starting the "pull out". The highest altitude we reach is about 34,000'. We usually do 40 of these in one mission. The zero g lasts for 20 to 30 seconds each "parabola" and there is much communication between the cockpit and the folks in the back during these maneuvers to insure everyone is right side up when we come out of zero g, so they don't end up on their heads! The minimum crew is two pilots, a flight engineer, and at least one test director in the back to orchestrate the experiments and to monitor safety. We always carry a flight doctor as well to treat those that need it for air sickness....hey, they don't call this the "Vomit Comet" for nothing!

I was in this jet when these shots were taken...it doesn't seem so radical inside!

Visual Observing — July 2006

Chris Randall

★**SSO**: (Solar System Objects) Summary for the 15 July 06

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	Gem	-26.7	100	06:30	13:26	20:21
Moon	Psc	----	70	23:51	05:19	11:22
Mercury	Gem	4.6	1	06:59	13:39	20:22
Venus	Tau	-3.9	88	04:34	11:31	18:27
Mars	Leo	1.8	97	09:06	15:40	22:18
Jupiter	Lib	-2.2	99	14:43	20:17	01:48
Saturn	Cnc	0.9	100	08:01	14:45	21:33
Uranus	Aqr	5.8	100	23:06	04:06	10:38
Neptune	Cap	7.8	100	21:48	03:14	08:40
Pluto	Ser	13.9	99	17:58	23:58	04:52

Highlighted times denote daylight events.

Lunar phases for July 06

First	Full	Third	New
3rd 11:37	10th 22:02	17nd 14:13	24th 23:31

★**BSO**: (Bright Sky Objects)

NGC 6475 (M 7, Cr 354) – Open Cluster in Scorpius, Magnitude 3.3, Size 80'.
IC 4665 (Cr 349, Mel 179)– Open Cluster in Ophiuchus, Magnitude 4.2, Size 40'.
NGC 6405 (M 6, Cr 341, Butterfly Cluster) - Open Cluster in Scorpius, Magnitude 4.2, Size 30'.
NGC 6124 (C 75, Cr 301, Mel 145) – Open Cluster in Scorpius, Magnitude 5.8, Size 29'.

★**DSO**: (Dark Sky Objects)

NGC 6543 (C 6, Cat's Eye Nebula) – Planetary Nebula in Draco, Magnitude 8.8, Size 20".
NGC 6210 – Planetary Nebula in Hercules, Magnitude 9.3 (P), Size 30".
IC 4593 – Planetary Nebula in Hercules, Magnitude 10.9 (P), Size 30".
NGC 6341 (M 92) – Globular Cluster in Hercules, Magnitude 6.5, Size 14'.

★**CDMP:** (Chris' Don't Miss Pick)

NGC 6302 (C 69) - Bug or Bipolar Nebula — Is a Planetary Nebula in Scorpius, Magnitude 9.6 (v), and Size 85" x 44". It lies about 4,000 light-years away in the Scorpius. With an estimated surface temperature of about 250,000 degrees C, the central star of this particular planetary nebula is exceptionally hot though -- shining brightly in ultraviolet light but hidden

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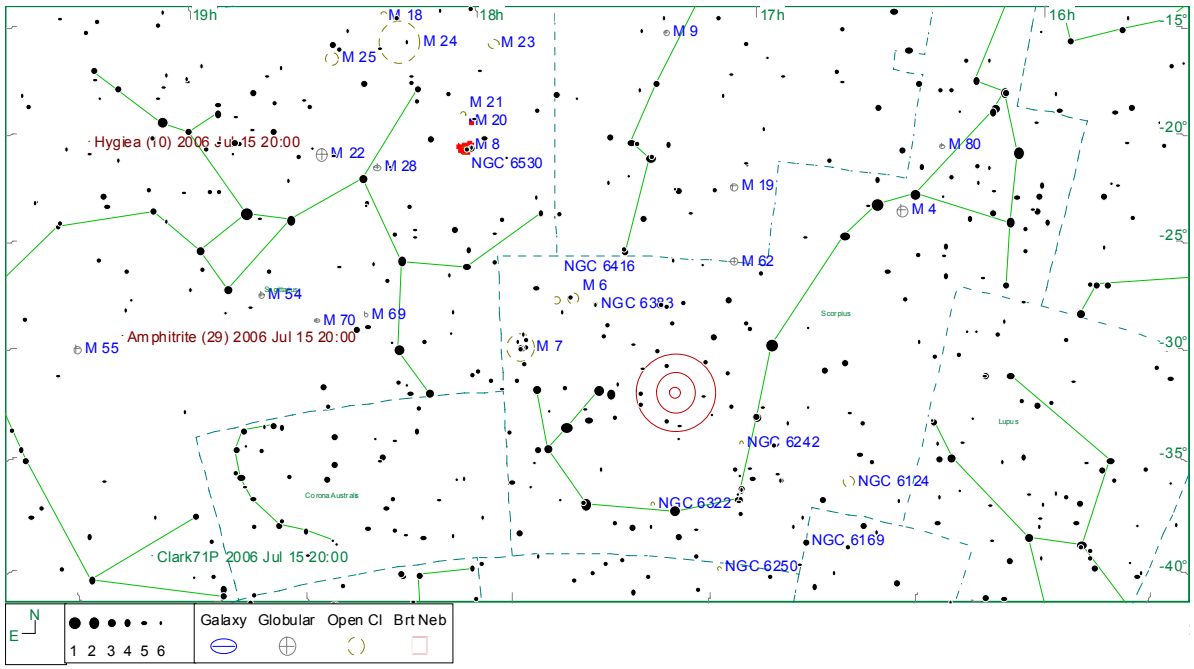
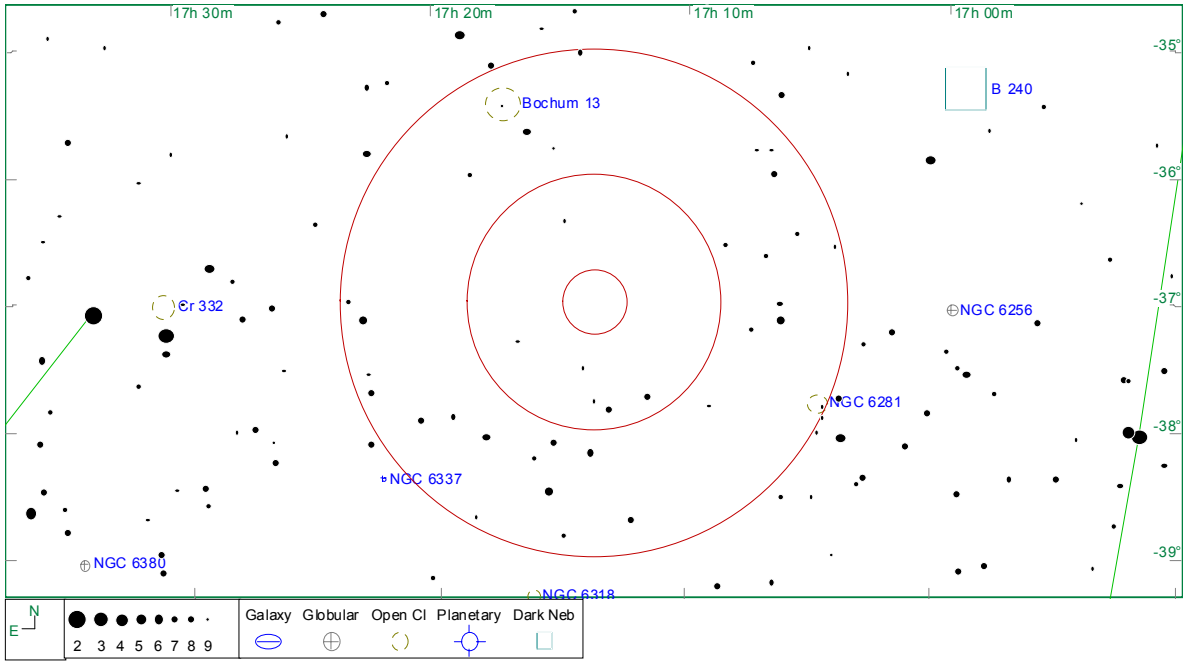
from direct view by a dense torus of dust. Cutting across a bright cavity of ionized gas, the dust torus surrounding the central star is nearly edge-on to the line-of-sight. Surprisingly, minerals including water ice, along with complex hydrocarbon molecules have been detected in this hot star's dusty cosmic shroud.



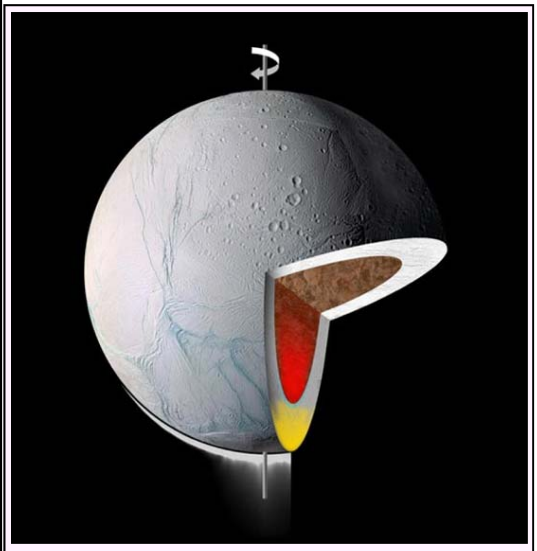


NASA-Funded Study Says Saturn's Moon Enceladus Rolled Over

News Release: 2006-080
May 31, 2006

Saturn's moon Enceladus – an active, icy world with an unusually warm south pole – may have performed an unusual trick for a planetary body. New research shows Enceladus rolled over, literally, explaining why the moon's hottest spot is at the south pole.

Enceladus recently grabbed scientists' attention when the Cassini spacecraft observed icy jets and plumes indicating active geysers spewing from the tiny moon's south polar region.



This graphic illustrates the interior of Saturn's moon Enceladus. It shows warm, low-density material rising to the surface from within, in its icy shell (yellow) and/or its rocky core (red). A NASA-funded study says Enceladus might have rolled or rotated itself to place this area of low density at the south pole. This finding is in the June 1, 2006, issue of the journal Nature.

This graphic uses parts of visible-light images taken by the Cassini spacecraft camera that have been modified for the purpose of showing the interior structure. Cassini's cameras captured a giant plume blasting icy particles into space.

Credit: NASA/JPL/Space Science Institute

"The mystery we set out to explain was how the hot spot could end up at the pole if it didn't start there," said Francis Nimmo, assistant professor of Earth sciences, University of California, Santa Cruz.

The researchers propose the reorientation of the moon was driven by warm, low-density material rising to the surface from within Enceladus. A similar process may have happened on Uranus' moon Miranda, they said. Their findings are in this week's journal Nature.

"It's astounding that Cassini found a region of current geological activity on an icy moon that we would expect to be frigidly cold, especially down at this moon's equivalent of Antarctica," said Robert Pappalardo, co-author and planetary scientist at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "We think the moon rolled over to put a deeply seated warm, active area there." Pappalardo worked on the study while at the University of Colorado.

Rotating bodies, including planets and moons, are stable if more of their mass is close to the equator. "Any redistribution of mass within the object can cause instability with respect to the axis of rotation. A reorientation will tend to position excess mass at the equator and areas of low density at the poles," Nimmo said. This is precisely what happened to Enceladus.

Nimmo and Pappalardo calculated the effects of a low-density blob beneath the surface of Enceladus and showed it could cause the moon to roll over by up to 30-degrees and put the blob at the pole.

Pappalardo used an analogy to explain the Enceladus rollover. "A spinning bowling ball will tend to roll over to put its holes -- the axis with the least mass -- vertically along the spin axis. Similarly, Enceladus apparently rolled over to place the portion of the moon with the least mass along its vertical spin axis," he said.

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The rising blob (called a "diapir") may be within either the icy shell or the underlying rocky core of Enceladus. In either case, as the material heats up it expands and becomes less dense, then rises toward the surface. This rising of warm, low-density material could also help explain the high heat and striking surface features, including the geysers and “tiger-stripe” region suggesting fault lines caused by tectonic stress.

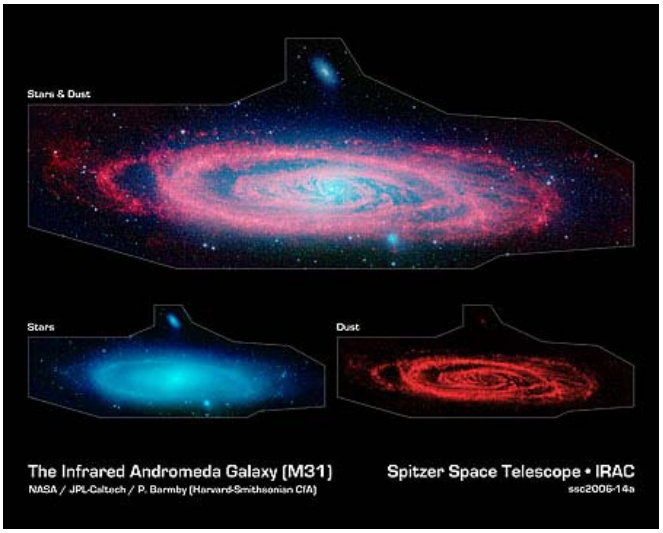
Internal heating of Enceladus probably results from its eccentric orbit around Saturn. "Enceladus gets squeezed and stretched by tidal forces as it orbits Saturn, and that mechanical energy is transformed into heat energy in the moon’s interior," added Nimmo.

Future Cassini observations of Enceladus may support this model. Meanwhile, scientists await the next Enceladus flyby in 2008 for more clues.

Andromeda Adrift in Sea of Dust in New NASA Image

Image Advisory: 2006-082
June 5, 2006

The Andromeda galaxy, named for the mythological princess who almost fell prey to a sea monster, appears tranquil in a new image from NASA's Spitzer Space Telescope. The mesmerizing infrared mosaic shows red waves of dust over a blue sea of stars.



"What's really interesting about this view is the contrast between the galaxy's smooth, flat disk of old stars and its bumpy waves of dust heated by young stars," said Dr. Pauline Barmby of the Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass. Barmby and her colleagues recently observed Andromeda using Spitzer.

Barmby and her team used the Spitzer data to make drastically improved measurements of Andromeda's infrared brightness. They found that the galaxy shines with the same amount of energy as about 4 billion suns. Based on these measurements, the astronomers confirmed that there are roughly 1 trillion stars in the galaxy. Our Milky Way galaxy is estimated to house a couple of hundred billion stars.

"This is the first time the stellar population of Andromeda has been determined using the galaxy's infrared brightness," said Barmby. "It's reassuring to know our numbers are in agreement with previous estimates of the mass of the stars based on the stars' motion."

The new false-colored portrait also provides astronomers with the best look yet at the dust-drenched spiral arms that swirl out of the galaxy's center, a region hidden by bright starlight in visible-light images. Dust and gas are the building materials of stars. They are clumped together throughout the spiral arms, where new stars are forming.

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"The Spitzer data trace with startling clarity the star-forming material all the way into the inner part of the galaxy," said Dr. George Helou, deputy director of NASA's Spitzer Science Center at the California Institute of Technology in Pasadena. "The challenge is to understand what shapes the distribution of this gas and dust, and what modulates the star formation at different locations."

Spitzer's infrared array camera captured infrared light emanating from both older stars (blue) and dust made up of molecules called polycyclic aromatic hydrocarbons (red). These carbon-containing molecules are warmed by sunlight and glow at infrared wavelengths. They are often associated with dense clouds of new stars, and can be found on Earth in barbecue pits and car exhaust, among other places.

The Andromeda galaxy, also known by astronomers as Messier 31, is located 2.5 million light-years away in the constellation Andromeda. It is the closest major galaxy to the Milky Way, making it the ideal specimen for carefully examining the nature of galaxies. On a clear, dark night, the galaxy can be spotted with the naked eye as a fuzzy blob.

Andromeda spans about 260,000 light-years, which means that a light beam would take 260,000 years to travel from one end of the galaxy to the other. By comparison, the Milky Way is about 100,000 light-years across. When viewed from Earth, Andromeda occupies a portion of the sky equivalent to seven full moons.

Spitzer's wide field of view allowed the telescope to capture a complete snapshot of the Andromeda galaxy, though the task wasn't easy. The final mosaic consists of 3,000 or so individual picture frames stitched together seamlessly.

Barmby presented these observations today at the 208th meeting of the American Astronomical Society in Calgary, Canada. A previous image of Andromeda taken with Spitzer's longer-wavelength infrared camera can be found at http://www.spitzer.caltech.edu/Media/releases/ssc2005-20/ssc2005-20a.shtml.

Hubble Sees Galaxy on Edge

This is a unique view of the disk galaxy NGC 5866 tilted nearly edge-on to our line-of-sight. Hubble's sharp vision reveals a crisp dust lane dividing the galaxy into two halves. The image highlights the galaxy's structure: a subtle, reddish bulge surrounding a bright nucleus, a blue disk of stars running parallel to the dust lane, and a transparent outer halo. NGC 5866 is a disk galaxy of type "S0" (pronounced s-zero). Viewed face on, it would look like a smooth, flat disk with little spiral structure. It remains in the spiral category because of the flatness of the main disk of stars as opposed to the more spherically rotund (or ellipsoidal) class of galaxies called "ellipticals." Such S0 galaxies, with disks like spirals and large bulges like ellipticals, are called 'lenticular' galaxies. NGC 5866 lies in the Northern constellation Draco, at a distance of 44 million light-years. It has a diameter of roughly 60,000 light-years only two-thirds the diameter of the Milky Way, although its mass is similar to our galaxy. This Hubble image of NGC 5866 is a combination of blue, green and red observations taken with the Advanced Camera for Surveys in February 2006.

Credit: NASA, ESA, and The Hubble Heritage Team (STScI/AURA); Acknowledgment: W. Keel (University of Alabama, Tuscaloosa)

NASA's Cassini Spacecraft Captures Saturnian Moon Ballet

Image Advisory: 2006-087
June 21, 2006

The cold, icy orbs of the Saturn system come to life in a slew of new movie clips from the Cassini spacecraft showing the ringed planet's moons in motion.

In addition to their drama and visual interest, scientists use these movies to refine their understanding of the orbits of Saturn's moons. Engineers at NASA's Jet Propulsion Laboratory, Pasadena, Calif., use the same images, and the orbital positions of the moons, to help them navigate Cassini. The spacecraft is nearing the halfway mark of its prime four-year tour of Saturn and its moons.

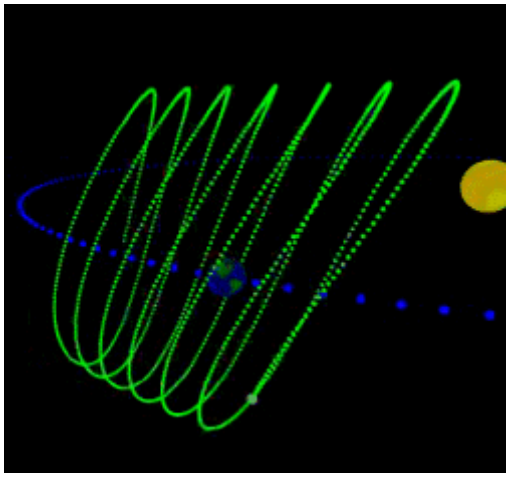
Pictures capturing several moons in one frame are strikingly beautiful, especially when deliberately imaged in red, green and blue spectral filters, which allow scientists to create a color photo. One recent color image shows two of Saturn's most fascinating moons, icy-white Enceladus and orange, haze-enshrouded Titan.

Still images and five short movie sequences acquired over the past six months are being released today at: http://www.nasa.gov/cassini , http://saturn.jpl.nasa.gov and http://ciclops.org.

Corkscrew Asteroid

Author: Dr. Tony Phillips
Production Editor: Dr. Tony Phillips
Credit: Science@NASA
06.09.2006

A tiny asteroid looping around Earth for the past seven years is about to leave the neighborhood.



June 9, 2006: News flash: Earth has a "second moon." Asteroid 2003 YN107 is looping around our planet once a year. Measuring only 20 meters across, the asteroid is too small to see with the unaided eye—but it is there.

This news, believe it or not, is seven years old.

"2003 YN107 arrived in 1999," says Paul Chodas of NASA's Near Earth Object Program at JPL, "and it's been corkscrewing around Earth ever since." Because the asteroid is so small and poses no threat, it has attracted little public attention. But Chodas and other experts have been monitoring it. "It's a very curious object," he says.

Most near-Earth asteroids, when they approach Earth, simply fly by. They come and they go, occasionally making news around the date of closest approach. 2003 YN107 is different: It came and it stayed.

"We believe 2003 YN107 is one of a whole population of near-Earth asteroids that don't just fly by Earth. They pause and corkscrew in our vicinity for years before moving along."

(Continued on page 17)

(Continued from page 16)

These asteroids are called Earth Coorbital Asteroids or "coorbitals" for short. Essentially, they share Earth's orbit, going around the Sun in almost exactly one year. Occasionally a coorbital catches up to Earth from behind, or vice versa, and the dance begins: The asteroid, while still orbiting the sun, slowly corkscrews around our planet.

"These asteroids are not truly captured by Earth's gravity," notes Chodas. "But from our point of view, it looks like we have a new moon."

Astronomers know of at least four small asteroids that can do this trick: 2003 YN107, 2002 AA29, 2004 GU9 and 2001 GO2. "There may be more," says Chodas. He believes the list will grow as asteroid surveys improve in sky coverage and sensitivity.

At the moment, only two coorbitals are actually nearby: 2003 YN107 and 2004 GU9. The others are scattered around Earth's orbit.

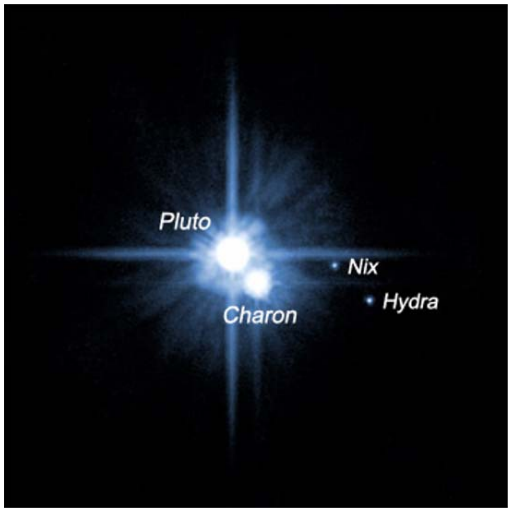
2004 GU9 is perhaps the most interesting. It measures about 200 meters across, relatively large. And according to calculations just published in the Monthly Notices of the Royal Astronomical Society (S. Mikkola et al., 2006) it has been looping around Earth for 500 years--and may continue looping for another 500. It's in a remarkably stable "orbit."

Right now, however, researchers are paying more attention to 2003 YN107 for one simple reason: it's about to depart. The asteroid's corkscrew path is lopsided and on June 10th it will dip within 3.4 million km of Earth, slightly closer than usual. Earth's gravity will then give the asteroid the nudge it needs to leave.

"This is a chance to observe one of these asteroids [on the way out]," explains Chodas.

It won't be gone forever. In about 60 years 2003 YN107 will lap Earth again, resuming its role as a temporary, corkscrewing moonlet. In due course, other coorbitals will do the same.

Each encounter is an opportunity for study--and possibly profit. Even the most powerful telescopes cannot see much of these tiny asteroids; they're just specks in the eyepiece. But one day, when the space program is more advanced (see the Vision for Space Exploration), it might be possible to visit, explore the moonlets and tap their resources. "For now, they're just a curiosity," says Chodas.



Pluto's Two Small Moons Officially Named Nix and Hydra

June 22, 2006
STScI-2006-29

A pair of small moons that NASA's Hubble Space Telescope discovered orbiting Pluto now have official names: Nix and Hydra. Photographed by Hubble in 2005, Nix and Hydra are roughly 5,000 times fainter than Pluto and are about two to three times farther from Pluto than its large moon, Charon, which was discovered in 1978.

Credit: NASA, ESA, H. Weaver (JHU/APL), A. Stern (SwRI), and the HST Pluto Companion Search Team

Hubble's Advanced Camera for Surveys Suspends Operations

From the Space Telescope Science Institute

On Monday, 19 June 2006, at 1:15 pm EDT (17:15 UT), the Advanced Camera for Surveys (ACS) issued status buffer messages indicating that the +15V and +5V power supply voltages in the CCD Electronics Box (CEB) were above their high limits, causing the ACS to suspend. This event occurred in a period with no ACS commanding and outside the SAA. A dump of the relevant data showed that a total of 36 CEB items exceeded limits at the time of the event.

At this point, the ACS is in a safe configuration, and further analysis is ongoing. Preliminary reviews of the telemetry and technical details about possibly affected components of ACS have been carried out. However, the root cause for the ACS suspend is still unknown. Further analysis and testing revolves around low-voltage power supplies as well as analog to digital converters. Analysis of ACS images taken before the suspend event shows no anomalies of any kind.

The further course of action will simultaneously prepare for further testing of the Side 1 electronics, which has been used since the installation of ACS, while preparing for a potential switch to the Side 2 electronics. The Side 1 tests will commence later this week, after verification that the tests will not harm the instrument. These tests will check various registers and voltages to pin down the location of the cause for the suspend.

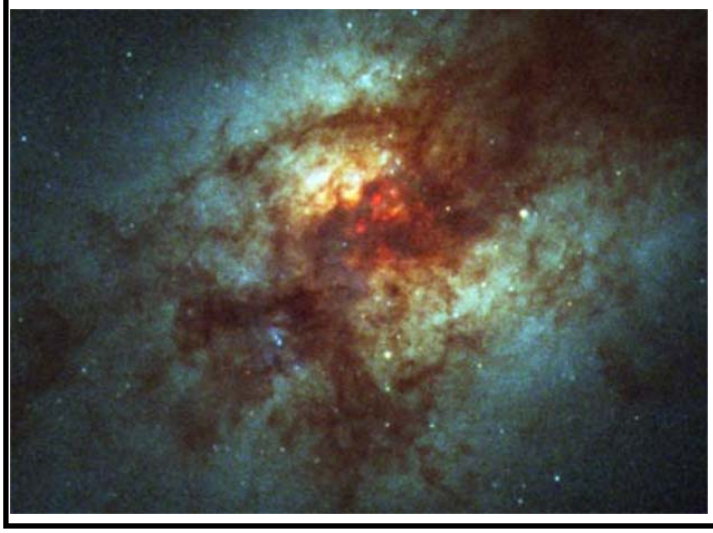
Preparations for a switch to Side 2 involve procedure verification, Flight Software changes, as well as the definition of calibration and verification programs to be executed before the full ACS science program could hopefully continue. A switch to Side 2 could come as early as the week of 26 June, if the tests successfully show that this would be beneficial.

For the time being, no ACS science observations will be carried out. Measures are being taken to advance non-ACS observations to fill the available time.

Hubble Eyes Star Birth in the Extreme

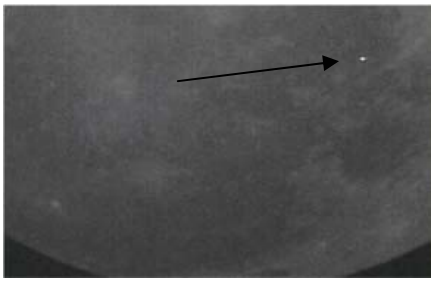
June 13, 2006
STScI - 2006-26

Staring into the crowded, dusty core of two merging galaxies, NASA's Hubble Space Telescope has uncovered a region where star formation has gone wild.



The interacting galaxies appear as a single, odd-looking galaxy called Arp 220. The galaxy is a nearby example of the aftermath of two colliding galaxies. In fact, Arp 220 is the brightest of the three galactic mergers closest to Earth. This latest view of the galaxy is yielding new insights into the early universe, when galactic wrecks were more common. The sharp eye of Hubble's Advanced Camera for Surveys has unveiled more than 200 mammoth star clusters. The clusters are the bluish-white dots scattered throughout the image.

Credit: NASA, ESA, and C. Wilson (McMaster University)



A Meteoroid Hits the Moon

June 13, 2006: There's a new crater on the Moon. It's about 14 meters wide, 3 meters deep and precisely one month, eleven days old.

NASA astronomers watched it form: "On May 2, 2006, a meteoroid hit the Moon's Sea of Clouds (Mare Nubium) with 17 billion joules of kinetic energy—that's about the same as 4 tons of TNT," says Bill Cooke, the head of NASA's Meteoroid Environment Office in Huntsville, AL. "The impact created a bright fireball which we video-recorded using a 10-inch telescope." To see the video, visit: http://science.nasa.gov/headlines/y2006/13jun_lunarsporadic.htm

Upcoming Events

ArkLaTex Star Party - 2006 Roy Clingan of the Red River Astronomy Club has sent the following invitation:

The Red River Astronomy Club will host our Second Annual ArkLaTex Star Party from September 21 - 24, 2006 near Nashville, Arkansas. Of course, the main attraction is the dark sky. This year's presentations will include a Mission Specialist (name to be announced by AAS), a Cosmochemist, a presentation on the mysterious lights of Gurdon, Arkansas and a workshop on image processing by a panel of experts.

Rex's Astro Stuff will have a wide variety of accessories available for sale. We offer free camping, observing field power for laptops and scopes, a shower, T-shirts, swap meet, bottomless coffee pot, cocoa and snacks plus our now famous ArkLaTex give-away. Thris's BBQ will have a catering trailer on site. What has become the hallmark of the star party is the relaxed and friendly atmosphere. 4 days / 3 nights. For details and registration visit http://www.rrac.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

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/.

For those who did not have a chance to attend this year's TSP, Texas IDA member Cindy Luongo Cassidy posted the following message on the Texas IDA Group Website describing TSP's Dark Sky Workshop. *Printed with permission.*

I wish each of you could have been at the Dark Sky Workshop held last Saturday afternoon at Texas Star Party. You could feel the "light control" energy with this group. We had a great list of speakers:

Chad Moore: Gathering Night Sky Data for the National Park Service (Wow! Chad and Dan Durisco's work for the NPS has been highlighted in the New York Times. Science News, NPR and will be in next month's National Geographic Adventure Magazine. You can see some of his work at www2.nature.nps.gov/air/lightscapes)

Angie Richman: Dark Sky Educational Efforts in New Mexico (New Mexico has funded four observatories in state parks with rangers trained by Angie to lead star parties. These attract lots of tourists and are great for local businesses.)

Barbara Wilson: Passing Texas Lighting Laws and the Ft. Bend Ordinance (This group knows about the Ft. Bend Ordinance. Part of Barbara's talk included information on a revision they're doing that I don't think the members of this group has heard about. The current ordinance bases lighting zones on population zones. The revision will base lighting zones on distance from the observatory.)

Benjamin Jones: The Helotes Lighting Ordinance Story (Another inspiring talk about how to influence the passage of a local ordinance.)

Bill Wren: Light Control Success, Techniques and Lessons Learned (Bill shared his technique of including pictures of local lighting into his presentation to bring the point home to his audience. He also tells about an interview he had with a newspaper reporter. The following day the front page headline read "Astronomers Want to Keep Us in the Dark". He says he's been working ten years to fix the damage that caused. So, now, he starts his presentation with a slide of that newspaper front page and immediately addresses the notion that we want all the lights out.)

Vance Bagwell: Simplifying Lighting Ordinances - Illumination Levels (Vance shared his technique of referring to the IESNA RP's (recommended practices) in an ordinance instead of cluttering the ordinance with specific Foot candles, etc. that confuse the general public.)

Anne Adkins: Current Texas State Level Light Control Efforts: Reviving the EOLC (Anne gave an overview of the revival of the Effective Outdoor Lighting Council . This group has already seen those proposals . That is, that the EOLC hopes to have the following bills submitted 1) To reduce disabling glare as seen from roadways; 2) To allow all County Commissioners to have the authority to enact light control ordinances; 3)To amend the 1999 law controlling state funded lighting to require FCO instead of just CO; 4) To include light pollution abatement requirements in the Texas Emissions Reduction Plan (SB5 of 2002). The EOLC members also hope to include light pollution reduction requirements in the Texas specific portion of the National Electric Code.)

Following the Q/A period, I invited everyone there to join this group (Texas IDA yahoo group) and the EOLC. The EOLC website will be updated soon. It is: http://users2.ev1.net/~mmccants/eolc/.

Image Credit:
TSP Staff

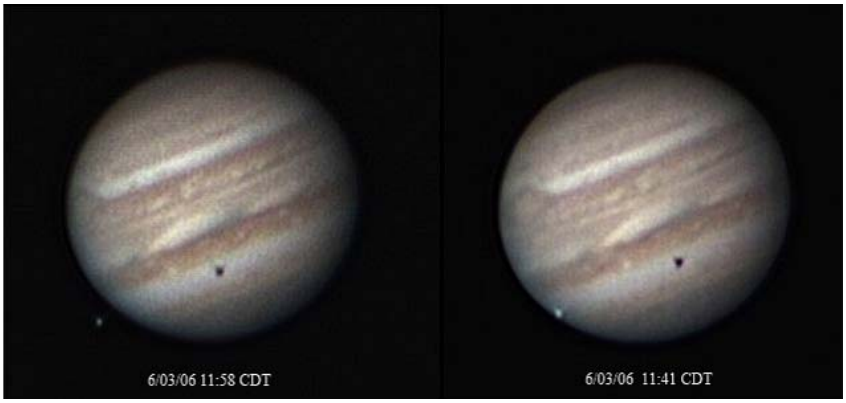
MEMBER'S GALLERY

M 3▲
©Chris Wells

This M3 image I took back on May 17th from my home in League City and just finalized processing. I have a new "unwelcome" neighbor in the form of a new professional center with stadium lights to illuminate the car lot and the back of my garage where my pier is sighted. Anyways I rigged up a tarp 4ft above the fence line (still not enough) but did manage to image M3 and was pleased that I could still image from home. Image times were 11mins Clear, 4mins Red, 6mins Green and 11mins Blue.

▲Whale Galaxy, NGC 4631
©Randy Brewer

14.5" RCOS @ F/6 on a Takahashi EM-500 with a Takahashi Pedestal. The camera was an SBIG ST-10XME using Don Goldman's LRGB Filters. Taken April 26th, 2006 at Ft. Davis, Texas. Exposure LRGB = 120:30:20:20 minutes.



▲Europa Transit
©Chuck Shaw

10"f/10SCT and a 2.5x Powermate barlow, and my PCVC675k webcam. Each image was an average of 300 frames, frame rate was 5 fps, and 1/25 sec integrations. Registax was used to register and process them and the post processing was in PS and Paint Shop Pro

▼ Summer Solstice Sunrise and Sunset
©Chris Randall

These images of the 2006 Summer Solstice were taken from Sylvan Rodriquez Park.

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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July Meeting Agenda

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

- Welcome!!!
- Guest Speaker: 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. July 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

Editor Ken Lester
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Cover Image
The Sunflower Galaxy
Credit: Randy Brewer

This is M 63 in Canes Venatici. It is a beautiful galaxy with a lot of structure in the arms. Note the many background galaxies including the edge on galaxy to the right of the center bright star. There is also more outer arm structure in the center on the right side. Optics 14.5" RCOS @ F/6; Mount Takahashi EM-500 on a Takahashi Pedestal; Camera SBIG ST-10XME; Filters Don Goldman's LRGB Filters; Date April 27th, 2006; Location Ft. Davis, Texas; Exposure LRGB = 115:20:20:20 minutes