STARSCAN

Johnson Space Center Astronomical Society

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May 2006

Ft McKavett Star Party

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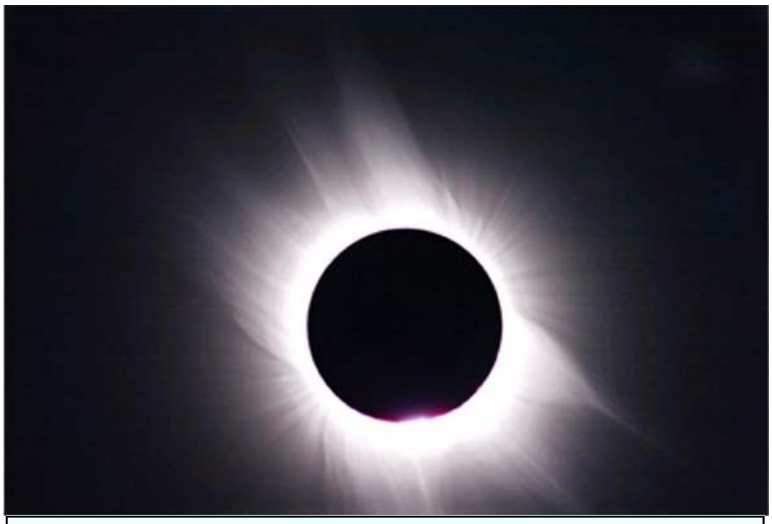
Solar Eclipse from Turkey

Thursday, 30 March 2006 15:10:47 +0100

Eddie Guscott



29th March, 2006 Side, Southern Turkey
80mm f7 refractor; Canon 300D dSLR; 1.5 seconds at ISO100

1st contact was greeted with cheers and it was really quite surprising how rapidly the Moon started to cover the Sun's disc.

About 15 minutes prior to 2nd contact, the temperature started to drop (from a balmy 23 centigrade) and the wind picked up a little (we were on the edge of the Mediterranean Sea).

About 5 or 6 minutes prior to 2nd contact Venus popped into view like a searchlight in the west. It really was that bright and could not be missed. All shadows were now very soft, and shadows of sharp objects (scope, tripod etc..) cast a sort of double shadow. People were putting sweaters on, the temperature had dropped that much.

Under a minute to go and the sky now quite dark (a deep twilight blue - not black) and in the west you can see beautiful pinky colors on the horizon. Someone shouted "the shadow's coming" !! and everyone looked out over the sea towards Africa. Sure enough, you could see the shadow racing across the ocean, like an incoming storm.

Quickly look up in the South to see the last tiny crescent of Sun disappearing and a brilliant diamond ring forming in slow motion before our eyes. Whooping and cheering ensued.....Within seconds, the corona is in view, and all I can see is the blackest black of a Moon surrounded by a slivery white (ghostly!!) glow, which seemed to be growing in extent as I watched.

I grabbed some unfiltered 10x50's - WOW - the Moon's on fire. Several deep pinky red prominences are protruding from behind the Moon and into the inner corona. Mercury is visible on a line from Venus to the Sun.

Looking through a Tak FS60 with a Panoptic 27mm I can only say that I "felt" as if everything I could see was actually moving (I know it was on the grand scale but the impression was of very slow movement - especially with the prominences). There was an impression of flickering at times, like watching a movie at a slow frame rate. Absolutely awesome. There was also a faint pinky red glow surrounding part of the Moon where no prominences could be seen. The corona was very delicate and wispy the further you looked away from the Moon/Sun edge, you could actually make out where the magnetic poles of the Sun were shaping the corona into curved streamers.

Someone shouted "30 seconds to go" - I couldn't believe it. 3 minutes of totality had already passed, and it only seemed like 30 seconds had passed.

I panicked and just grabbed some pictures with the camera on "bulb" with the remote release (luckily

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some came out not too bad).

3rd contact has to be one of the most memorable moments of my life. A brightening of the limb where the Sun would appear was quickly followed by a flash that lit the whole sky up - like a flash-gun going off in slow motion. It seemed to hang there for several seconds, showing colors through the complete spectrum.

More whooping and cheering and it's all over. Bright daylight resumed within seconds of 3rd contact, as opposed to the gradual decrease in brightness over 10 minutes or so prior to totality. Very strange.

Truly a remarkable and awesome sight - nature doesn't offer anything better.

Visit Eddie's web site at: http://www.astropics.co.uk/solarsystem.htm.

The 360 Degree Total Solar Eclipse In The Libyan Desert March 29, 2006

Paul D. Maley

Most, but not all members of Groups 1 and 2 in the Sahara desert eclipse camp. Left to right Ondrej Krivanek, Denise Gomez-English, Matt Delvoryas, Jim Rosenstock, Robyn Hess, Debbie Moran, Irene Talbott, Dick Mischke, David Weber, Carole Hollaman, Terry Kemper, Lynn Palmer, Olav Andrade, Bob Walch, Margaret Scherbina, Dan Deshon, Paul Scherbina, Betsy Vobach, Alex McNair, Dick Dietz, David Flack, Michelle Otake, Claude Nicollier, Wynne Lienhardt, Anne Reuter, David English, Paul Maley.

The 32nd Ring Of Fire expedition to observe a solar eclipse once again experienced a highly successful trip. Three teams of eclipse seekers traveled to the same spot south of Jalu, Libya in order to observe a completely and wonderfully successful total eclipse expedition. Teams 1 and 2 were handled by Wings Travel, while team 3 was handled locally by Numidia Tours. It was Wings that did our principal coordination and the results of this were truly outstanding. Teams 1 and 2 toured only in Libya while tour 3 continued on into Egypt, some members enjoying a cruise along the Nile River. There were no visa problems and the tours were carried out as planned although there some logistical questions that were not understood until the groups arrived. The hospitality of

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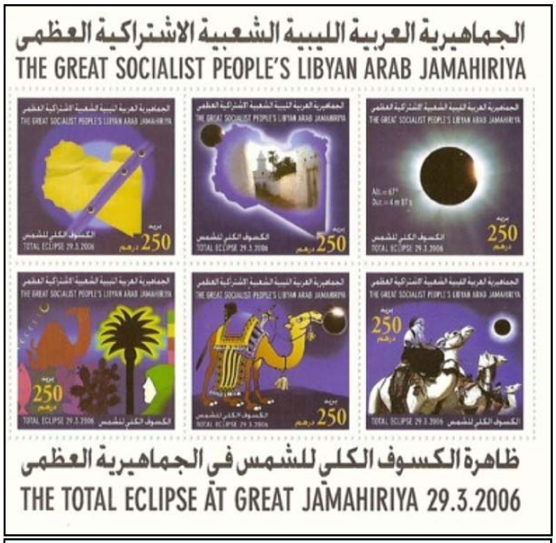

Stamps issued in honor of the total eclipse

the Libyan people wherever we went was very open and helpful making this one of the best travel experiences.

On eclipse morning, I was able to use David English's Iridium satellite phone to communicate to our NASA weather expert, Steve Sokol, who also provided great near real-time recommendations in Panama last year. Steve confirmed what we could see ourselves---severe clear skies and no reason to travel anywhere. It was the best possible option for our three teams.

Now for the best part. The eclipse had to have been one of the best visual experiences of all time. Under the transparent desert sky, the corona was very bright. This was solar minimum but it was easy to read camera dials and I thought the overall darkness was less than at recent eclipses. The sun's high altitude also was a plus and the extent of the corona was at least 3 solar radii visually. Anne Reuter observed Mercury and Canopus. I was able to see Venus 1 hour 6 minutes before totality--the earliest ever. The wind had been predicted to blow from north to south but actually blew in the reverse direction causing any dust kicked up by drivers to be blown away from observers.

A Ring Of Fire Expeditions tradition is to fly the Texas flag; it was first flown at Lake Guatavita, Colombia in 1977. Here it is at our camp in the Sahara desert. The Libyan flag is above it. Debbie Moran photo.

Shadow bands! The 'star' of the pre- and post-eclipse show were best observed by David Weber who noted that he was awash in a sea of them. Three to four minutes before 2nd contact they were about 12-18 inches apart and moving along at 10-15 feet per second. After the eclipse they were seen up to 5 minutes following 3rd contact; spacing appeared to be wider. He described them as visible 45-50 feet distant and showed better on the sand surface than on white cloth. The shadow of the moon appeared as conical but also had a dome-like appearance as it enveloped the site 5-10 seconds before 2nd contact. Shadow bands are generally perceived in a different way by almost everyone. Pat Reiff noted that the shadow bands seemed to pass in batches and were not at all continuous. The diamond ring was seen at both 2nd and 3rd contact but more prominently at 3rd. Anne thought she saw shadow bands or something akin to them silhouetted in the dust cloud raised not far from where she was standing. I have only seen shadow bands once and if were not for the fact that I dropped a battery on the ground, I would not have noticed them--incredibly easy to see skipping across the flat sand in front of me essentially moving in the same direction as the moon's shadow. When reviewing the links at the bottom of my web page, do not miss Kyle Carmona's shadow band video--one of the best I have seen. Movies showing the bands are quite rare. This one really shows how low contrast these bands appear.

Temperature measurements were logged by Terry Kemper, Wynne Lienhardt and Mamta Rajan. Unfortunately, the data was somewhat incomplete and inconsistent between the three thermometers. We will have to figure out a way to get better weather data logging equipment next time.

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Dick Dietz repeated his Questar video of the edge of the sun, recording a videotape showing the coronal structure all around the periphery during totality. In addition he recorded some very high quality Baily's Beads at both 2nd and 3rd contacts. The corona appeared saturated more so than at other eclipses and the Beads were far more pronounced at the centerline than in the past. I think both of these video responses were due to the clarity of the air at the desert site.

The preparation and execution of the camp and logistics were amazing considering the difficulties of the desert and the large number of tourists. We generally had privacy, access to toilets, a mess tent, AC power, the internet, and the local Red Crescent standing by for medical support. Vendors were in a different part of the camp. Overall there were actually several camps in one for a total of perhaps 1200 persons in our area alone.

Visit Paul's website for photos of the tour and complete results: http://eclipsetours.com/.

Spring Fort McKavett Star Party

What a great trip! Sorry I'm late in joining in the banter, I've been too busy scratching at the bumper crop of chiggers I gathered down near the springs. What makes an insect seek out your "nether regions" anyway. Last night I heard them singing!

That aside, we had a great crowd and lots of fun out west. OK, the weather could have opened up a bit more for us but I'll take what we were given. For those who got to look through Hernan's scope, consider yourselves fortunate! What a fine mirror! As for all the pictures taken: WOW! It was great seeing Shane and Becky again, I'm almost over them moving away without a vote. We had some first-time visitors this trip and hopefully the weather won't deter them from attending again. Buddy took care of us once more with two excellent meals on Saturday. If anyone went hungry it was their own darn fault.

Thanks to Ken, we now have more than ample power down near the ruins for RV's and our scopes. Now, Dolly can watch movies, crank the A/C down to 40 and bake brownies with no risk of tripping a breaker!! Steve was gracious enough to supply wireless internet service for everyone this trip. Randy was able to email Steve in the morning to see if the coffee was ready. Their rear windows faced each other, he could have just looked out the window for Pete's sake!

Thanks to everyone who made this another Fort McKavett success!

A message from Bob Taylor posted on the list server.

Once again we had a fun star party at the fort. While the weather prevented any serious observing, I believe just about everyone had a great time. Here are some pictures taken during the event.

Collimating A Light Bridge

Glenn and Ron help collimate Fred and Jennifer's new Light Bridge.

Lightning Strike
Becky Ramotowski

New Member Steve Baier
With Club Scope

This was Steve's first Fort McKavett visit. He was joined by several other new members, Steve Yeathermon, Mark Florian, and Fred and Jennifer Coleman.

Storm Heading For McKavett
Dale Evans

It was just after sunset when I noticed this thunder-storm headed Mc Kavett way. It was huge and full of lightning. I was just south of Girvin on Hwy 67 and the storm appeared to be moving east/ northeast towards Mc Kavett. The red lights in the picture are from a wind farm. I couldn't find my tripod so this picture is hand held resting on the cartop carrier.

▲Polaris Over The Flag Pole Chris Randall **Lightning Strike▼**

The Hanging Tree
John Cavuoti II

Although no one was ever hung from this tree, that we know of, its unique character is so appropriate for Fort McKavett.

Note the Moon above left of the flag pole.

Friday Night Cook Out
Steve Baier

Sunset
Dale Evans

Taken with a Canon Powershot A620

A Personal Reflection …
Ken Lester

In years past, like so many of you, as I drove away from the fort at the end of the star party I would feel a tremendous dread at returning to the hustle and bustle of life in the big city. However, this year was different. Because I'm working at the fort now, I have a whole new feeling at the end of the star party.

On Sunday afternoon, the scope field was bare. The RVs were gone. The laughter had faded. The barracks were empty. There was absolutely no signs that JSCAS had been there. So sad!

More Fort McKavett Star Party

Lisa Lester

Buddy and the rest of the staff at the park barely had time to breathe after the Living History event before members of the Johnson Space Center Astronomical Society began arriving on Tuesday, March 28th for their Spring Star Party. By Thursday, there were 40 amateur astronomers at the Fort enjoying the night skies. The first few nights they were able to observe until midnight or 1 a.m. However, Thursday was very cloudy during the day and the clouds didn't disappear at sunset. People were able to observe the Moon and a few other objects between the clouds but then the skies became completely overcast. It was just as well, because we had a school presentation to do in San Angelo Friday afternoon, so getting a good night's rest made sense.

Eight members of the club and two guests headed to Lamar Elementary in San Angelo to give astronomy presentations to 410 3rd – 5th graders. They were very interested and asked wonderful questions. Friday night we had a group cook out and plenty of time to talk and visit because the skies clouded over completely shortly after sunset. Some club members did get to observe in the middle of the night when the skies cleared for awhile.

Saturday at noon, the JSCAS members were treated to Buddy's wonderful BBQ and enjoyed several flavors of cobbler with ice cream for dessert. A small silent auction was held and $657.00 was raised through the auction, donations, and memberships. It was cloudy all day but the skies cleared some at sunset. A Boy Scout troop and visitors from as far away as San Antonio and Austin were able to observe a variety of objects including the Moon, Mars, Saturn, M51, and the Orion Nebula.

Sunday morning everyone slowly packed up, stopping to talk and visit and already planning to be back in October.

Star Party News

Lisa Lester

The Star Party at the Haak Winery was a success, as always! The skies had been partly cloudy all day and the weather forecast was for more of the same. As we gathered, the Sun began to disappear, the clouds cleared to the west and we had hopes that the weather predictions would be wrong. However as dusk settled in, the clouds returned. Thankfully, they were fast moving and did not blanket the skies. I had sent out a "GO!" on the list server in the early afternoon because the visitors to the Haak Winery have taught me that clouds will not deter them! I guess that means that they already know what we know: there are two words to "Star Party" and if there are no stars then we will party!

The turnout of telescopes and binoculars was terrific! If I hadn't seen the list of people heading out to West Texas I wouldn't have known that the Texas Star Party began the next day! You all are awesome! Thank you so much for coming and I hope that you had a terrific time sharing your love of astronomy with such an interested audience. The number of visitors was in the hundreds and was easily our largest turnout to date! As Bob Taylor said in his email: "I think I counted 18 scopes in all and still we saw lines of at least twenty people at some scopes. It was almost like work!" We have two more star parties at the Haak Winery to look forward to later this year. If you were unable to attend this one, plan to join us for the next Haak event which will be September 23rd.

Our next start party will be August 26th at Moody Gardens! Until then, I hope that you have a wonderful summer with your families and clear skies at night!

Event	Date	Sun Set	Moon			Jupiter		Saturn		Mars		Venus	
			Illum.	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
2006													
LPI	May 6	20:20	68%	14:36	03:23	20:04	06:55	12:20	02:06	10:35	00:48	04:57	17:01
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

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

Visual Observing—May 2006

Chris Randall

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

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	Tau	-26.7	100	06:28	13:15	20:05
Moon	Sgr	----	91	23:01	02:59	07:59
Mercury	Ari	-1.9	99	06:21	13:05	19:53
Venus	Psc	-4.0	71	04:33	10:43	16:54
Mars	Gem	1.6	94	10:09	17:09	00:12
Jupiter	Lib	-2.5	100	19:02	00:31	05:59
Saturn	Cnc	0.7	100	11:31	18:19	01:12
Uranus	Aqr	5.9	100	03:05	08:51	14:37
Neptune	Cap	7.9	100	01:50	07:17	12:44
Pluto	Ser	13.9	99	22:08	03:33	08:58
C/2005 E2 McNaught	Per	10.5	99	06:48	14:18	21:52
Schwassmann-Wachmann 73P	Peg	6.6	41	01:21	08:01	14:42

Highlighted times denote daylight events.

Lunar phases for March 06
Central Daylight time

First	Full	Third	New
5th 00:13	13th 01:51	20nd 04:21	27th 00:26

★**BSO**: (Bright Sky Objects)

Mel 111- Open Cluster in Com, Magnitude 1.8, Size 275', Stars 80.
NGC 5139 (C-80, Omega Centauri) – Globular Cluster in Cen, Magnitude 3.6, Size 55.0'
NGC 5272 (M-3) - Globular Cluster in CVn, Magnitude 6.3, Size 18.0'.
NGC 4361 (H-65-1) – Planetary Nebula in Crv, Magnitude 10.3 (P), Size 118.0"

★**DSO**: (Dark Sky Objects)

NGC 5128 (C-77, Cen A) – Galaxy System in Cen, Magnitude 7.8, Size 25.8' x 20.0'.
NGC 4485 & 4490 (A-269, Cocoon) - Galaxy System in CVn, Magnitude 10.2, Size 6.3' x 3'.
NGC 4567 & 4568 (Siamese Twins) – Galaxy System in Vir, Magnitude 12.1, Size 3.3' x 2'.
NGC 3631 (A-27, H-226-1) – Galaxy in UMa, Magnitude 11.0, Size 5.0' x 4.7'.

★**CDMP:** (Chris' Don't Miss Pick)

NGC 4258 (M-106) – Galaxy in CVn, Magnitude 9.1, Size 18.8' x 7.3'.

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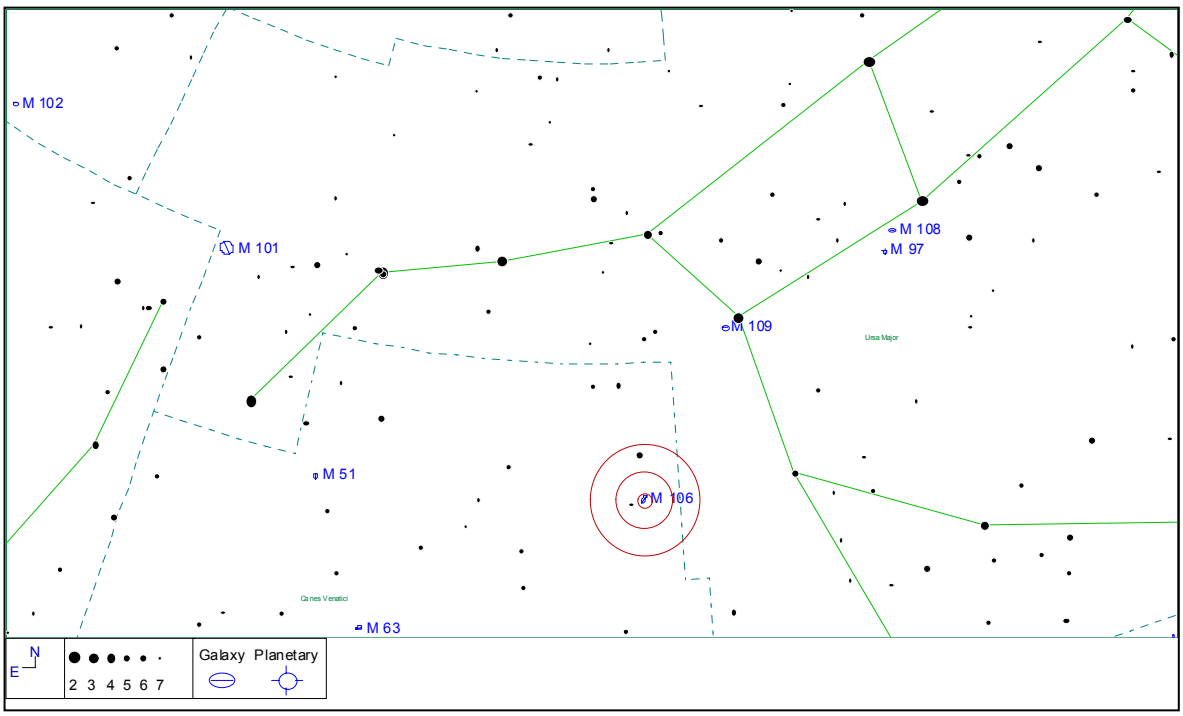
M106 is a bright Sb spiral galaxy and is about 21 to 25 million light years distant from Earth. It is receding at 537 km/sec. It was discovered by Pierre Méchain in July 1781, and independently rediscovered by William Herschel on March 9, 1788.

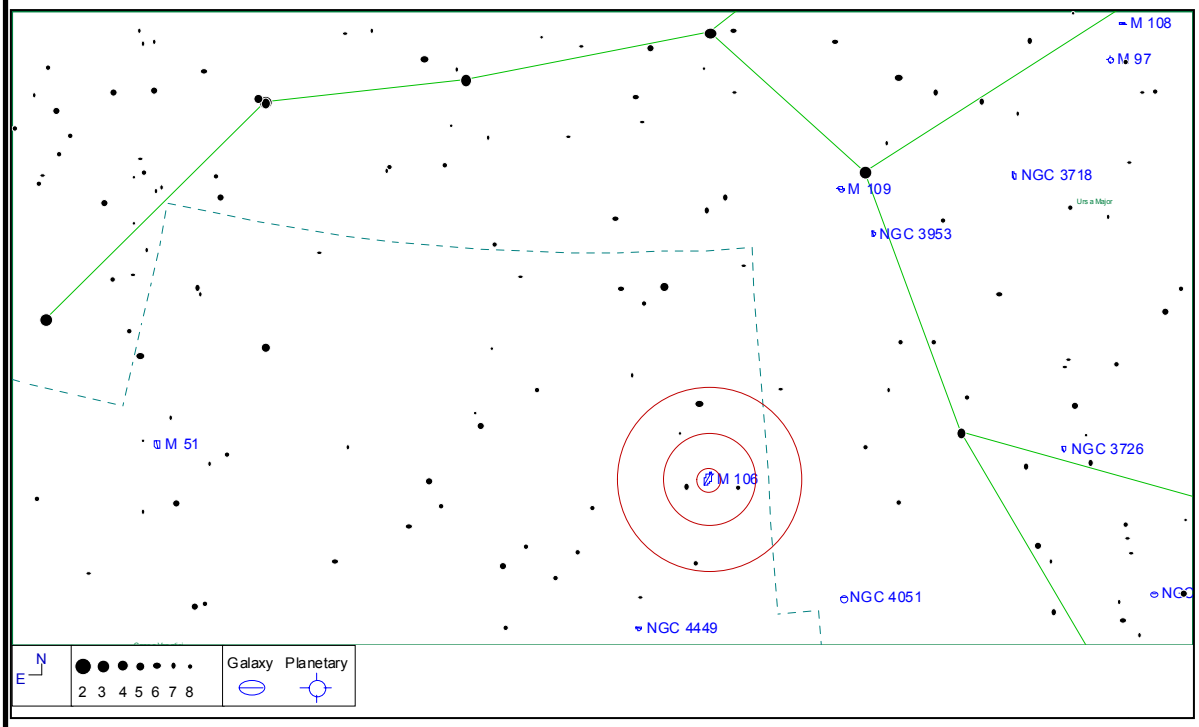
Since the 1950s, M106 has been known to have a much larger extent in the radio radiation than in visual light. In 1943, Carl K. Seyfert had listed this galaxy among the galaxies with emission line spectra from their nuclei, which are now called Seyfert galaxies. Nevertheless, only few modern studies of Seyfert galaxies include it, although its nucleus is classified as Seyfert 1.9, according to the NED data of this galaxy.

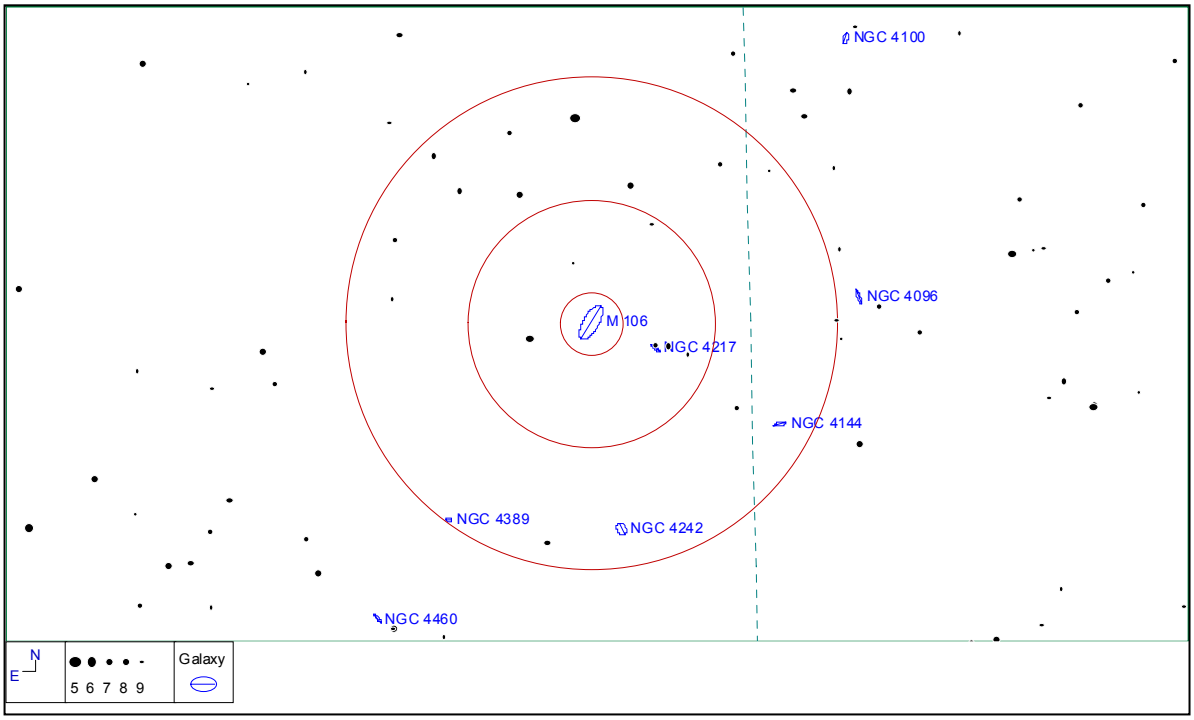
M106 is one of Pierre Méchain's findings, which were later appended as additional objects to Charles Messier's catalog. In the case of M106, it was Helen Sawyer Hogg who added it, together with M105 and M107 in 1947. It appears reasonable to assume that Méchain had intended to add it to a future edition. William Herschel had numbered it H V.43 when cataloging it on March 9, 1788.

In 1995, investigations with the Very Large Baseline Array radio telescope equipment gave evidence that M106 is possibly the home of a massive dark object, which could be traced to the lowest distance from the center ever possible up to now. Thirty-six million solar masses apparently reside within a volume of about 1/24 to 1/12 light year radius (27,000 to 54,000 AU). This was then the densest matter concentration ever detected.

For further information visit: http://www.seds.org/ or http://www.ngcic.org/ .




M 108
M 97
NGC 3718
M 109
Ursa Major
NGC 3953
M 51
NGC 3726
M 106
NGC 4051
NGC 4449
N
E
2 3 4 5 6 7 8
Galaxy
Planetary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M 106
NGC 4217
NGC 4144
NGC 4389
NGC 4242
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E
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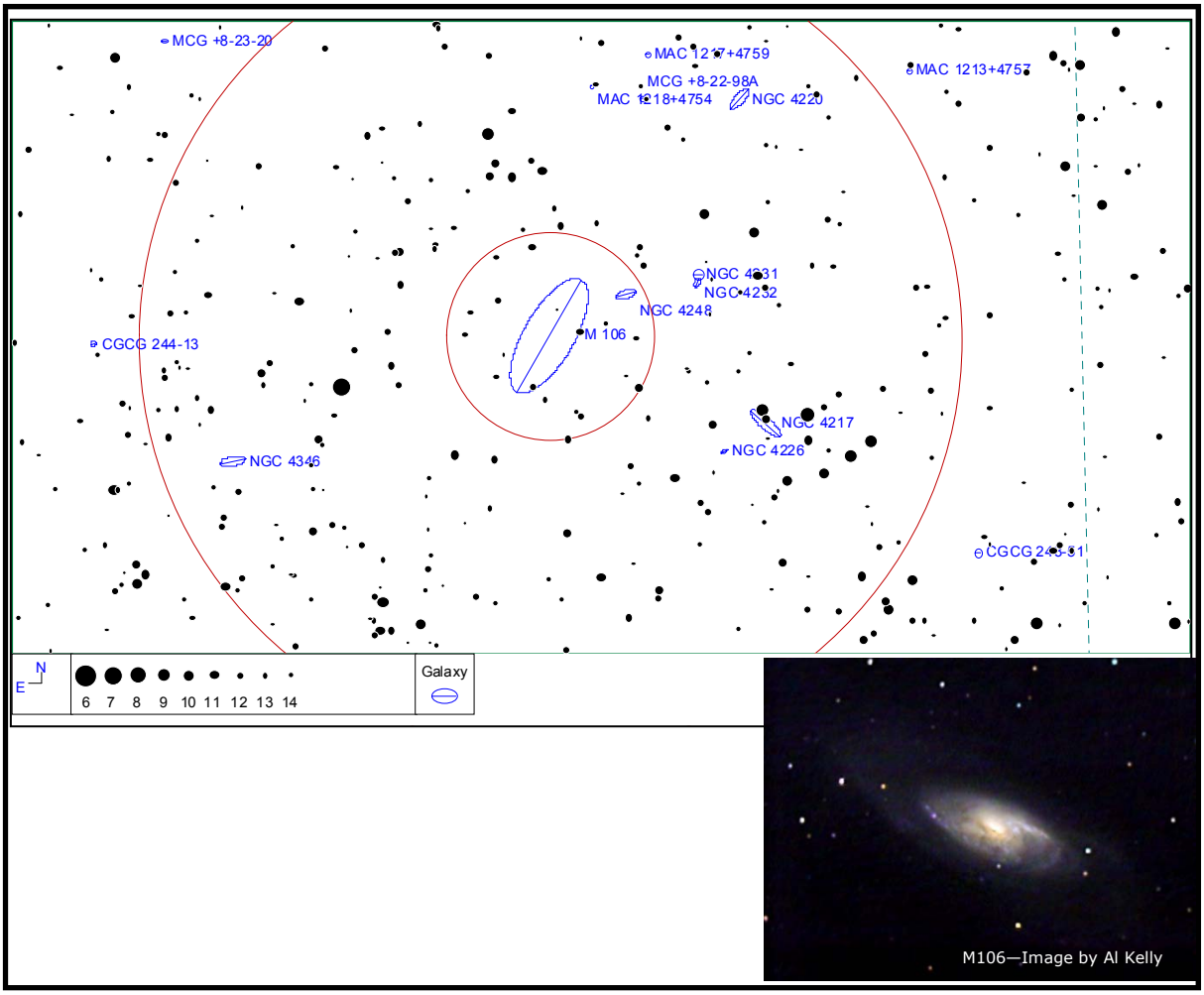
Galaxy



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

Planetary Society Opens World's First Dedicated Optical SETI Telescope

Cutting the Ribbon
Clockwise from top left: Paul Horowitz, Louis Friedman, Charles Alcock, and Vida Kazemi at the Optical SETI telescope ribbon-cutting ceremony at the Oak Ridge Observatory, April 11, 2006. Credit: The Planetary Society

Pasadena, CA, — April 11, 2006, The Planetary Society dedicated a new optical telescope at an observatory in Harvard, Massachusetts -- one designed solely to search for light signals from alien civilizations. Read more.

Opening ceremonies for The Planetary Society's Optical SETI Telescope featured Project Director Paul Horowitz of Harvard University; Planetary Society Chairman Neil deGrasse Tyson, director of New York's Hayden Planetarium; and Society Executive Director Louis Friedman.

"With the launch of The Planetary Society's Optical SETI Telescope," said Friedman, "we are proud to be part of a new voyage of discovery with this great Harvard team."

The new telescope is the first dedicated optical SETI telescope in the world. Its 72-inch primary mirror is larger than that of any optical telescope in the U.S. east of the Mississippi River.

Under the direction of Horowitz and his team, the optical SETI telescope will conduct a year round, all-sky survey, scanning the entire swath of our Milky Way galaxy visible in the northern hemisphere.

"This new search apparatus performs one trillion measurements per second and expands by 100,000-fold the sky coverage of our previous optical search," said Horowitz.

The telescope has been built at the Harvard Smithsonian Center for Astrophysics Oak Ridge Observatory, where for many years, The Planetary Society has conducted radio telescope SETI searches with Horowitz. The first was the Mega-channel Extraterrestrial Assay (META) search, which was later expanded to the Billion-channel Extraterrestrial Assay (BETA).

Alien civilizations are thought by many to be at least as likely to use visible light signals for communicating as they are to use radio transmissions. Visible light can form tight beams, be incredibly intense, and its high frequencies allow it to carry enormous amounts of information. Using only Earth 2006 technology, a bright, tightly-focused light beam, such as a laser, can be ten thousand times as bright as its parent star for a brief instant. Such a beam could be easily observed from enormous distances.

"The opening of this telescope represents one of those rare moments in a field of scientific endeavor when a great leap forward is enabled," said Planetary Society Director of Projects Bruce Betts. "Sending laser signals across the cosmos would be a very logical way for E.T. to reach out, but until now, we have been ill equipped to receive any such signal."

The Planetary Society's Optical SETI telescope's custom processors will process the equivalent of all books in print every second. As the telescope scans stripes of sky, it employs a custom-built

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"camera" containing an array of detectors that can detect a billionth-of-a-second flash of light. The telescope will scan the sky every night, weather permitting.

Planetary Society members around the world helped fund the optical SETI telescope. Additional major support for the telescope came from the Bosack/Kruger Foundation.

Since its founding, the Society has been a leading advocate of the Search for Extraterrestrial Intelligence, supporting a wide variety of searches, making use of different approaches. The first META search, which began over 20 years ago, kicked off with a significant donation from Society Board Member Steven Spielberg. Most of the Society-sponsored searches have been radio SETI projects. The new observatory is one of the largest SETI projects ever sponsored by The Planetary Society.

Refurbishing NASA's 16" Apollo Era Telescope

Andy (Yoda) Saulietis

EV at JSC has decided to refurbish the 16" SCT that was on top of Bldg 16A since 1968. It was 'retired' in 1995 and lent to Space Center Houston to use as a functional Apollo-era engineering artifact, but this never happened because of lack of funds to provide a roll-off shelter for the telescope.

In late 2005, JSC brought the scope, mount, and accessories back to Bldg 16a and it was scheduled to be excessed along with the 14' Observa-dome still on the roof.

After some in house discussions at EV, they approached me to see if I would assist in refurbishing the telescope & dome, since I was the principal designer/user of the system for 27 years. I met with EV after the last Ft McKavett Star Party, and gave them an estimate of what needed to be done to make the scope and dome functional again. At that time there was no funding available.

Recently, funding was located and after much discussion with EV, Jacobs, and myself, it was decided to postpone the dome refurbishment; too much money out of the wrong pot. I was to go ahead and refurbish the scope/mount here at my workshop. An agreement was reached to locate the refurbished telescope here at my observing site (Star's End, Mayhill, NM) and provide the capability to operate the instrument remotely via the Internet. Chuck Shaw and I have been developing the servo systems and other control hardware/software to be able to do this, using a 6" equatorial telescope that I've built. We're almost ready to calibrate and use this telescope as a test bed for the JSC 16" and a 37" Newtonian I'm building for a small college. The reason for doing all this is because of the current emphasis on Lunar/planetary programs and to provide direct real time access to celestial objects and events by NASA and educational institutions. The scope would also again function as a test bed for testing new star trackers and other optical guidance hardware.

Having the JSC scope located in New Mexico has several advantages:

-it can be used much sooner than waiting for the dome to be refurbished (if ever)
-I can provide on-site maintenance, training, and operational support
-the dark skies and visibility here are far superior than that at JSC

Anyway, I'll be at JSC May 1st and 2nd to finalize the restoration project. The project should be operational by the end of the year.

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(Continued from page 17)
If the JSCAS troops agree, I'd like to suggest to EV that JSCAS assist in the remote operation of the JSC instrument. It will have several switchable CCD and video cameras. JSCAS would also have limited access to use of the 6" f8 APO refractor and the 37" Wheaton telescopes. Perhaps a SIG can be formed for this.

I'm not a real whiz with PC's and current remote control software. Chuck has been invaluable in guiding me up the learning curve, but help from JSCAS expertise would be wonderful as well!

I'm looking forward to finishing these telescope projects and becoming more of a retired person, and being able to finally do observing instead of building!

Upcoming Events

The Rocky Mountain Star Stare (RMSS) is not your typical star party. It's laid back. It's family oriented. It's in the heart of the Rocky Mountains, just 65 miles west of Colorado Springs. You don't camp on top of your neighbor. You can set up outside of your tent or RV. You have great trout fishing just a short drive away. You have turn of the century casinos just a short drive away. There is white water rafting, nature hiking, and horseback riding just a short drive away. But best of all there's a universe of stars, galaxies, nebulae, and clusters just above the horizon in every direction. Whether you are looking through a 20 inch Dob or a pair of binoculars there's more to see in a night than most people get to see in a month and some see in a lifetime.

Introduce your family to the wonders of the Colorado Rockies and the awesome spectacle of dark skies. Who knows, you might make a scientist out of one of your kids yet. And even if you don't it will be an unforgettable family experience. Join us for our 20th Anniversary celebrating the night sky.

This year's event is held from June 22nd-25th and pre-registration is currently open. Information on RMSS and online registration can be found at http://www.rmss.org. To speak to someone regarding RMSS, groups, or other items pertaining to RMSS, please contact Alan Gorski, Public Relations Director at csaspr@csastro.org or 719.651.8476.

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Through some work, a star party date of November 3rd has been set up at Richmond State School (near Sugarland). The adult residents of the school have severe and profound mental retardation.

A few folks from the Ft. Bend group said they'd help out. We'd probably need more scopes with holes in the primary since many of the residents have balance issues and need to sit down.

The sister of one of the residents has enlisted a cosmologist from Cornell University, to help with the program design. She has the staff working with the residents using music, art, recreational and occupational therapies to help them understand astronomy more before the star party.

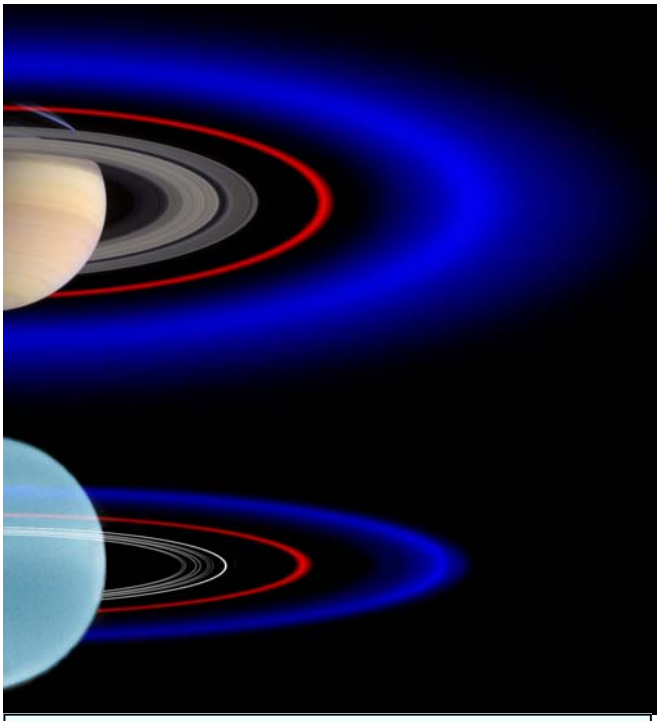
JPL News Release: 2006-071;May 4, 2006

The latest research suggests a Saturn day is 10 hours, 47 minutes, 6 seconds (plus or minus 40 seconds). That's 8 minutes slower than NASA Voyager results from the early 1980s, and slower than previous estimates from another Cassini instrument. The magnetometer results provide the best estimate of the Saturn day to date, because it can see deep inside Saturn.

Blue Ring Discovered Around Uranus

By Robert Sanders, Media Relations
University of California, Berkeley
06 April 2006

The outermost ring of Uranus, discovered just last year, is bright blue, making it only the second known blue ring in the solar system, according to a report this week in the journal Science.



A comparison of the outer rings of Saturn (at top) and Uranus, where each system has been scaled to a common planetary radius. The recently discovered outer ring of Uranus, like that of Saturn, is blue because the material in these rings is smaller than the material in the inner, red rings. Credit: Imke de Pater, Heidi Hammel, Seran Gibbard, Mark Showalter, courtesy Science.

Perhaps not coincidentally, both blue rings are associated with small moons.

"The outer ring of Saturn is blue and has Enceladus right smack at its brightest spot, and Uranus is strikingly similar, with its blue ring right on top of Mab's orbit," said Imke de Pater, professor of astronomy at the University of California, Berkeley. "The blue color says that this ring is predominantly submicron-sized material, much smaller than the material in most other rings, which appear red."

The authors of the paper in the April 7 issue of Science are de Pater, Mark Showalter of the SETI Institute in Mountain View, Calif.; Heidi B. Hammel of the Space Science Institute in Boulder, Colo.; and Seran Gibbard of Lawrence Livermore National Laboratory in California.

The similarity between these outer rings implies a similar explanation for the blue color, according to the authors. Many scientists now ascribe Saturn's blue E ring to the small dust, gas and ice particles spewed into Enceladus' orbit by newly discovered plumes on that moon's surface. However, this is unlikely to be the case with Mab, a small, dead, rocky ball, about 15 miles across - one-twentieth the diameter of Enceladus.

Instead, the astronomers suspect both rings owe their blue color to subtle forces acting on dust in the rings that allow smaller particles to survive while larger ones are recaptured by the moon.

"We know now that there is at least one way to make a blue ring that doesn't involve plumes, because Mab is surely too small to be internally active," said Showalter. He and astronomer Jack Lissauer of NASA Ames Research Center in Mountain View, Calif., discovered Mab in Hubble Space Telescope images in 2003.

The likely scenario to explain Saturn's blue ring was proposed before plumes were discovered last November as the Cassini spacecraft flew by Enceladus. As modeled for the E ring, meteoroid impacts on the surface of Enceladus scatter debris into its orbit, probably in a broad range of sizes. While the larger pieces remain within the moon's orbit and eventually are swept up by the moon,

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smaller particles are subject to subtle forces that push them toward or away from the planet out of the moon's orbit. These forces include pressure from sunlight, magnetic torques acting on charged dust particles, and the influence of slight variations in gravity due to the equatorial bulge of Saturn.

The net result is a broad ring of smaller particles, most less than a tenth of a micron across - a thousandth the width of a human hair - that scatter and reflect predominantly blue light.

"This model can be transferred directly to what we now see in Uranus, although we still need to understand the details of the process," de Pater said.

All other rings - those around Jupiter, Saturn, Uranus and Neptune - are reddish. Though they contain particles of many sizes that reflect many wavelengths of light, red dominates not only because larger particles - many microns to meters across - are abundant, but also because the material itself may be reddish, perhaps from iron.

"Arguing by analogy, the two outermost rings, the two rings that have satellites embedded in them, are both the blue rings. That can't be coincidental, there has to be a common thread of dynamics that is causing both of these phenomena," Showalter said.

The discovery of the blue ring came after combining ground-based near-infrared observations by the Keck Telescope in Hawaii and visible-light photos taken by the Hubble Space Telescope. De Pater, Hammel and Gibbard have observed Uranus since 2000 with the second-generation NIRC2 infrared camera using the adaptive optics system on the Keck II telescope, and in August 2005 obtained 30 new images of the planet in hopes of seeing new features as the ring plane moves edge-on to Earth.

Showalter and Lissauer, on the other hand, captured numerous visible-light images of Uranus between 2003 and 2005 with Hubble's Advanced Camera for Surveys.

Neither team realized it had captured pictures of new rings until an extensive analysis, basically piling image upon image until faint features stood out from the background. In December 2005, as Showalter and Lissauer reported finding two new rings - Uranus's 12th and 13th - and two new moons, Mab and Cupid, numbers 26 and 27, de Pater, Hammel and Gibbard reported seeing the red, innermost of the two new rings but not the outermost. The blue ring peaks in brightness about 97,700 kilometers from the planet's center, exactly at Mab's orbit.

Further analysis proved to both teams that the outer ring seen in visible light was definitely not observable in the near-infrared, and so must be blue. The analysis also showed that Mab, which like its ring could not be seen in the infrared, is probably covered with water ice, like the other outer moons of Uranus, and is probably Uranus's smallest moon.

De Pater's research is supported by the National Science Foundation and the Technology Center for Adaptive Optics at UC Santa Cruz. Hammel is supported by NASA, while Gibbard is supported by the U.S. Department of Energy's National Nuclear Security Administration.

Showalter's work is supported by NASA through the Space Telescope Science Institute.

Cassini Finds 'Missing Link' Moonlet Evidence in Saturn's Rings

News Release: 2006-046 March 29, 2006

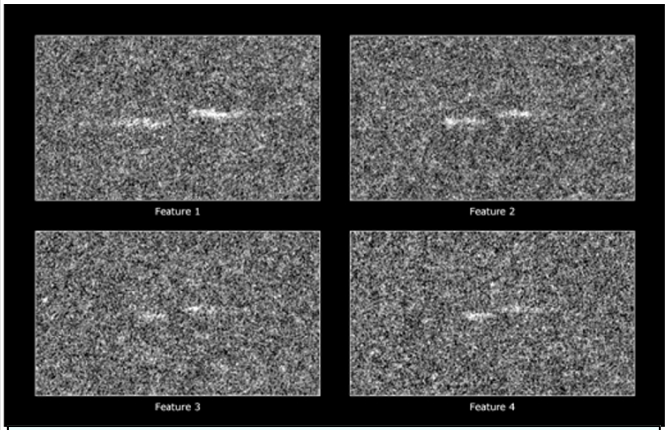
Scientists with NASA's Cassini mission have found evidence that a new class of small moonlets resides within Saturn's rings. There may be as many as 10 million of these objects within one of Saturn's rings alone.

The moonlets' existence could help answer the question of whether Saturn's rings were formed through the break-up of a larger body or are the remnants of the disk of material from which Saturn and its moons formed.

"These moonlets are likely to be chunks of the ancient body whose break-up produced Saturn's glorious rings," said Joseph Burns of Cornell University, Ithaca, N.Y., a co-author of the report.

Careful analysis of high-resolution images taken by Cassini's cameras revealed four faint, propeller-shaped double streaks. These features were found in an otherwise bland part of the mid-A Ring, a bright section in Saturn's main rings. Cassini imaging scientists reporting in this week's edition of the journal Nature believe the "propellers" provide the first direct observation of how moonlets of this size affect nearby particles. Cassini took the images as it slipped into Saturn orbit on July 1, 2004.

Previous measurements, including those made by NASA's Voyager spacecraft in the early 1980s, have shown that Saturn's rings contain mostly small water-ice particles ranging from less than 1 centimeter (one-half inch) across to the size of a small house. Scientists knew about two larger embedded ring moons such as 30-kilometer-wide (19-mile) Pan and 7-kilometer-wide (4-mile) Daphnis. The latest findings mark the first evidence of objects of about 100 meters (300 feet) in diameter.



These figures show four propeller-shaped structures discovered by the Cassini spacecraft in close-up images of Saturn's A ring.

The propellers are about 5 kilometers (3 miles) long from tip to tip, and the radial offset (the "leading" dash is slightly closer to Saturn) is about 300 meters (1,000 feet). See pia07791 and pia07792 for additional images and information about these features.

The figures were cropped from two original Cassini spacecraft narrow-angle camera images and magnified for visibility. The images were then re-projected so that orbital motion is to the left and Saturn is up. The unseen moonlets lie in the center of each structure. The figures were cropped from two original Cassini spacecraft narrow-angle camera images, taken during Saturn orbit insertion on July 1, 2004, and magnified for visibility.

From the number of moonlets spotted in the very small fraction of the A ring seen in the images, scientists estimated the total number of moonlets to be about 10 million.

"The discovery of these intermediate-sized bodies tells us that Pan and Daphnis are probably just the largest members of the ring population, rather than interlopers from somewhere else," said Matthew Tiscareno, an imaging team research associate at Cornell and lead author on the Nature paper.

Moons as large as Pan and Daphnis clear large gaps in the ring particles as they orbit Saturn. In contrast, smaller moonlets are not strong enough to clear out the ring, resulting in a partial gap centered on the moonlet and shaped like an airplane propeller. Such

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features created by moonlets were predicted by computer models, which give scientists confidence in their latest findings.

"We acquired this spectacular, one-of-a-kind set of images immediately after getting into orbit for the express purpose of seeing fine details in the rings that we had not seen previously," said Carolyn Porco, Cassini imaging team leader and co-author. "This will open up a new dimension in our exploration of Saturn's rings and moons, their origin and evolution."

The detection of moonlets embedded in a ring of smaller particles may provide an opportunity to observe the processes by which planets form in disks of material around young stars, including our own early solar system. "The structures we observe with Cassini are strikingly similar to those seen in many numerical models of the early stages of planetary formation, even though the scales are dramatically different," said co-author Carl Murray, an imaging team member at Queen Mary, University of London. "Cassini is giving us a unique insight into the origin of planets."

Nearby Dust Clouds in the Milky Way

NASA's Hubble Space Telescope has photographed dense, dark knots of dust and gas in our Milky Way Galaxy. This cosmic dust is a concentration of elements that are responsible for the formation of stars in our galaxy and throughout the universe. These dark, opaque knots of gas and dust are called "Bok globules," and they are absorbing light in the center of the nearby emission nebula and star-forming region, NGC 281. These images were taken with Hubble's Advanced Camera for Surveys in October 2005. NGC 281 is located nearly 9,500 light-years away in the direction of the constellation Cassiopeia.

Credit: NASA, ESA, and The Hubble Heritage Team (STScI/ AURA) Acknowledgment: P. McCullough (STScI)

NASA Picks Contractor to Chill Space Telescope Instrument

News Release: 2006-050 April 6, 2006

NASA has awarded a subcontract to Northrop Grumman Space Technology in Redondo Beach, Calif., to develop an ultra-cold mechanical helium cryocooler for the Mid-Infrared Instrument on the James Webb Space Telescope. The contract totals about $22 million.

NASA's Jet Propulsion Laboratory, Pasadena, Calif., is the U.S. partner in developing the instrument, along with a European consortium sponsored by the European Space Agency. With a planned 2013 launch, the Webb Space Telescope will study the earliest galaxies and some of the first stars formed after the Big Bang. The cryocooler delivery date is 2010.

The Mid-Infrared Instrument must be cooled to 6 Kelvin (minus 449 degrees Fahrenheit), much colder than the planned 40 Kelvin (minus 388 Fahrenheit) temperature of the Webb Space Telescope. This will allow the instrument to detect room temperature heat emitted by stars, galaxies and other objects.

Galaxies Don Mask of Stars in New Spitzer Image

News Release: 2006-065 April 26, 2006

A pair of dancing galaxies appears dressed for a cosmic masquerade in a new image from NASA's Spitzer Space Telescope.

Credit: NASA/Spitzer Space Telescope

The infrared picture shows what looks like two icy blue eyes staring through an elaborate, swirling red mask. These "eyes" are actually the cores of two merging galaxies, called NGC 2207 and IC 2163, which recently met and began to twirl around each other.

The "mask" is made up of the galaxies' twisted spiral arms. Dotted along the arms, like strings of decorative pearls, are dusty clusters of newborn stars. This is the first time that clusters of this type, called "beads on a string" by astronomers, have been seen in NGC 2207 and IC 2163.

"This is the most elaborate case of beading we've seen in galaxies," said Dr. Debra Elmegreen of Vassar College in Poughkeepsie, N.Y. "They are evenly spaced and sized along the arms of both galaxies."

Elmegreen is lead author of a paper describing the Spitzer observations in the May 1 issue of the Astrophysical Journal. The image can be viewed at http://www.spitzer.caltech.edu/spitzer

Astronomers say the beads were formed when the galactic duo first met. "The galaxies shook each other, causing gas and dust to move around and collect into pockets dense enough to collapse gravitationally," said Dr. Kartik Sheth of NASA's Spitzer Science Center at the California Institute of Technology in Pasadena. Once this material condensed into thick bead-like clouds, stars of various sizes began to pop up within them.

Spitzer's infrared camera was able to see the dusty clouds for the first time because they glow with infrared light. The hot, young stars housed inside the clouds heat up the dust, which then radiates at infrared wavelengths. This dust is false-colored red in the image, while stars are represented in blue.

The Spitzer data also reveal an unusually bright bead adorning the left side of the "mask." This dazzling orb is so packed full of dusty materials that it accounts for five percent of the total infrared light coming from both galaxies. Elmegreen's team thinks the central stars in this dense cluster might have merged to become a black hole.

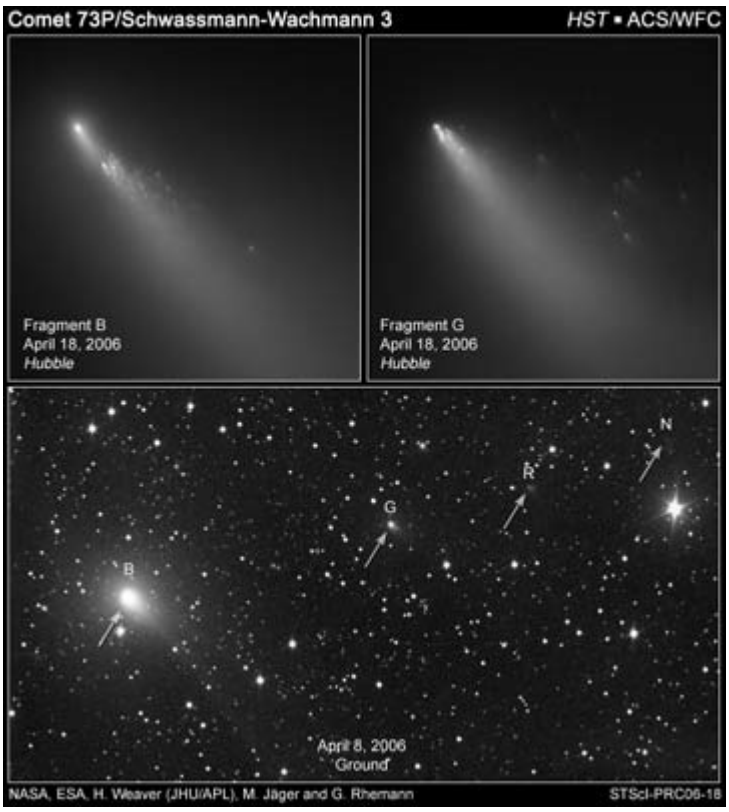
Visible-light images of the galaxies show stars located inside the beads, but the beads themselves are invisible. In those pictures, the galaxies look more like a set of owl-like eyes with "feathers" of scattered stars.

NGC 2207 and IC 2163 are located 140 million light-years away in the Canis Major constellation. The two galaxies will meld into one in about 500 million years, bringing their masquerade days to an end.

Other authors of this research include Bruce Elmegreen of IBM Watson Research Center, Yorktown Heights, N.Y., Michele Kaufman of Ohio State University, Columbus; Curt Struck of Iowa State, Ames; Magnus Thomasson of Onsala Space Observatory, Sweden; and Elias Brinks of the University of Hertfordshire, United Kingdom.

Hubble Provides Spectacular Detail Of A Comet's Breakup

NASA's Hubble Space Telescope is providing astronomers with extraordinary views of Comet 73P/ Schwassmann-Wachmann 3. The fragile comet is rapidly disintegrating as it approaches the Sun. Hubble images have uncovered many more fragments than have been reported by ground-based observers. These observations provide an unprecedented opportunity to study the demise of a comet nucleus. The comet is currently a chain of over three dozen separate fragments, named alphabetically, stretching across the sky by several times the angular diameter of the Moon. Hubble caught two of the fragments, B and G (top frames) shortly after large outbursts in activity on April 18, 19, and 20, 2006. Hubble shows several dozen "mini-comets" trailing behind each main fragment, probably associated with the ejection of house-sized chunks of surface material. Deep-freeze relics of the early solar system, cometary nuclei are porous and fragile mixes of dust and ices that can break apart due to the thermal, gravitational, and dynamical stresses of approaching the Sun. Whether any of the many fragments survive the trip around the Sun remains to be seen in the weeks ahead.



Credit for Hubble images: NASA, ESA, H. Weaver (JHU/APL), M. Mutchler and Z. Levay (STScI)

Credit for ground-based image: G. Rhemann and M. Jager

Pieces of NASA'S Next Mars Mission are Coming Together

News Release: 2006-066 April 26, 2006

NASA's Phoenix Mars Lander, the next mission to the surface of Mars, is beginning a new phase in preparation for a launch in August 2007.

As part of this "assembly, test and launch operations" phase, Phoenix team members are beginning to add complex subsystems such as the flight computer, power systems and science instruments to the main structure of the spacecraft. The work combines efforts of Lockheed Martin Space Systems, Denver; the University of Arizona, Tucson; and NASA's Jet Propulsion Laboratory, Pasadena, Calif.

"All the subsystems and instruments from a wide range of suppliers are tested separately, but now we are beginning the vital stage of assembling them together and testing how they will function with each other," said JPL's Barry Goldstein, project manager for Phoenix.

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An artist rendition of Phoenix's robotic arm delivering a sample to the science instruments. Image Credit: NASA / UA / JPL

Phoenix will land near the red planet's north polar ice cap to analyze scooped-up samples of icy soil.

"We know there is plenty of water frozen into the surface layer of Mars at high latitudes. We've designed Phoenix to tell us more about this region as a possible habitat for life," said the University of Arizona's Peter Smith, principal investigator for the mission.

Phoenix is the first mission of NASA's Mars Scout Program of competitively proposed, relatively low-cost missions to Mars. The program is currently soliciting proposals for a 2011 Scout mission.

The Phoenix proposal, selected in 2003, saves expense by using a lander structure, subsystem components and protective aeroshell originally built for a 2001 lander mission that was canceled while in development. The budget for the Phoenix mission, including launch, is $386 million.

The spacecraft will land using descent thrusters just prior to touchdown, rather than airbags like those used by the current Mars Exploration Rovers. As Phoenix parachutes through Mars' lower atmosphere in May 2008, a descent camera will take images for providing geological context about the landing site.

The robotic arm being built for Phoenix will be about 2 meters (7 feet) long, jointed at the elbow and wrist, and equipped with a camera and scoop. It will dig as deep as about 50 centimeters (20 inches) and deliver samples to instruments on the spacecraft deck that will analyze physical and chemical properties of the ices and other materials. A stereo color camera will examine the landing site's terrain and provide positioning information for the arm. The Canadian Space Agency is providing a suite of weather instruments for Phoenix.

"The propulsion system and the wiring harness have been added to the vehicle," said Ed Sedivy, Phoenix program manager for Lockheed Martin. "We will be loading flight software onto the flight computer in the next few days. The flight software is much more mature than typical for a planetary program at this stage. As soon as the flight computer is mated up, we can apply external power to the vehicle."

Navigation components, such as star trackers, and communication subsystems will become part of the spacecraft in coming weeks, followed by science instruments in the summer.

Phoenix will be shipped to NASA's Kennedy Space Center, Florida, in May 2007, for final preparations leading up to launch. Before that, testing in Colorado will subject the spacecraft to expected operational environments. This includes thermal and vacuum tests simulating the 10-month trip to Mars and conditions on Mars' surface. Meanwhile, the mission is preparing a test facility in Tucson for practicing and testing procedures for operating the spacecraft on Mars.

For more information visit: http://phoenix.lpl.arizona.edu/?msource=06606&tr=y&auid=1616222.

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/.

News from the I.D.A. Convention, March 15-18, 2006 in Tucson

Julie Schaar, TAS member

The International Dark-Sky Association recently took an important step. For the first time since the organization was established 18 years ago, all eligible members were sent ballots enabling them to vote for the IDA Board of Directors. Nearly 20 percent (~800) of eligible members cast votes. Thanks to TAS and individual IDA members for sending in your ballots.

Three members of the National Park Service 'Night Sky Team' spoke of measuring sky brightness from national parks, and creating "Natural Lightscapes". Funding is secured for two more years for this project.
See their web site for information that is applicable to our observing sites: http://www2.nature.nps.gov/air/lightscapes/
and an article in the March 2006 issue of Science News about their work: http://www.sciencenews.org/articles/20060318/bob10.asp

IDA and IES-NA have joined efforts in developing a Model Outdoor Lighting Ordinance! The MLO will continue public commentary using a performance (permit) process instead of a prescriptive (follow rules) process, which could be a 3-year review process. Thanks to the efforts of some IDA members to "Fix the MLO", lumens per square foot allowances have been included. Formerly, the allowance was only for watts per square foot. Of course, the number of lumens per watt varies so widely, that watts per square foot by itself is meaningless.

A new Luminaire Classification System (LCS) was approved by the IES in January 2006, according to Nancy Clanton, P.E., IES-NA, lighting designer in Colorado Springs, who is assisting the City of Denver in developing an outdoor lighting ordinance. She indicated that this system will replace the old definitions of FCO (full cutoff), CO, (cutoff) etc.

Ms. Clanton described three zones in the new definitions:

Forward Zone--- targets the 'effective area'—why you put in the fixture

Backlight Zone---limited from trespassing the boundary

High angle Zone---glare zone

She also explained that IES-NA is considering labeling luminaries with ratings based on the lumen levels at various angles from the luminaire (fixture and lamp together). That is, the first rating digit is for 180 – 90 degrees from the horizontal angle at the bottom of the fixture; the second digit is for 90 to 63 degrees (glare zone); the third digit is backlight (trespass). However, a fixture can move to different ratings by lowering the wattage. Lumens can be still be specified by Lighting Zone for contractors and enforcers.

Member Recognition

An Ed Grafton Mars image was used in the Astronomy magazine article (June 2006): "*Relive the Red Planet's big show*" by Donald C. Parker

MEMBER'S GALLERY

◄M81
©Chris Wells

Taken March 24, 2006 at Danciger Texas, with a Celestron C8 at f6.5 on a PM1 equatorial mount.

L/RGB Processing from 5 clear, 3 red, 6 green and 11 blue images. Images are all 1 minutes un-guided and unbinned.

Processed in AIP4WinV2 and Photoshop.

▲Moon Moves Through The Pleiades
©Becky Ramotowski

Here's one of the images I made of the Moon as it was passing in front of the Pleiades on Saturday night while we were at the Fort. I shot this one through Glen Schaeffer's 20" Obsession. It was a gorgeous sight! Hand held Nikon 5000.

◄Comet Schwassmann-Wachmann
©Becky Ramotowski

Comet Schwassmann-Wachmann is nearing Earth and has been putting on a fairly nice show for sky watchers the past few weeks.

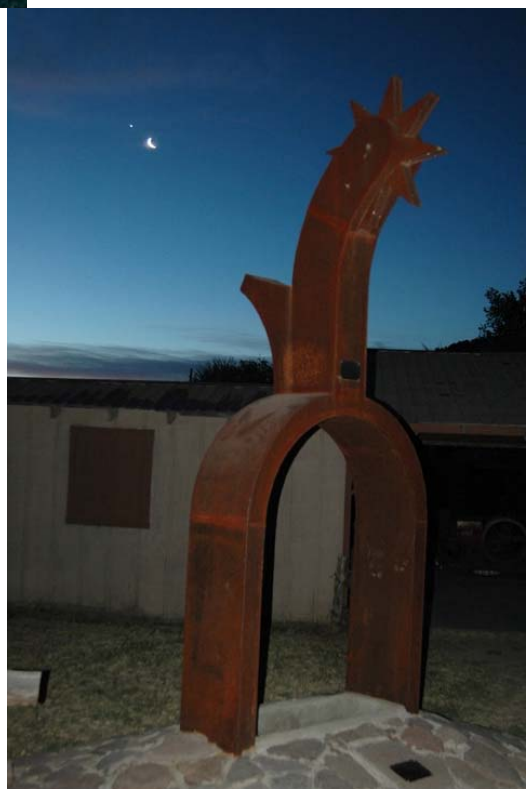
Her image shows the backwards C-shaped pattern of stars making up the constellation of Corona Borealis. That's where the comet was hanging out last week when she first started watching it.

Your challenge is to find the two fragments in the image. Becky tweaked the green in PhotoShop to bring out the color of the fragments, so the background looks a bit off.

If you need more information on the comet, take a look at Heavens-above.com and click on the link for the comet.

Moon-Venus Conjunction►
©Becky Ramotowski

Venus and the Moon hang low in the morning sky. Taken April 24th at the Prude Ranch, Ft Davis, Texas



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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May Meeting Agenda

Due to a last minute, unexpected problem at LPI, The May meeting has been **cancelled**. LPI is in the process of re-carpeting the auditorium and has all the chairs removed.

Starscan Submission Procedures

Original articles of astronomical interest will be accepted up to 6 P.M. May 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
Associate Editors	Sheila Steele
	Ken Steele

Cover Image
Ruins and Star Trails
Credit: Becky Ramotowski

Here's a shot from my recent journey to Fort McKavett. This is the Commanding Officer's Quarters.....or what's left of it. It's a grand building, and I often watch the stars trail through the vacant windows and doors while visiting the site. There are bats that fly around and it's common to hear them making their high pitched chirps while they are out foraging in the night. Occasionally an owl will fly by and it's only after the fact that you realize a very large bird has flown by without so much as making a sound. Great place to watch stars and wildlife.