April 2010

The Observer

East Valley Astronomy Club

Volume 24 Issue 4

From the Desk of the President
by David Douglass

2010 is moving right along. The Saguaro Astronomy Club (SAC) sponsored All Arizona Messier Marathon (AAMM) is now over. It was a fantastic weekend out in the desert. There were some earlier weather forecasts that promised to spoil the event, but as the day drew near, the forecast changed, and the weather man was our friend again. For those of us who were there both nights, we had fantastic skies. Overall, there was no "official" count as to the number of people that attended, but my "unofficial" count was about 40 setups for Friday evening, and something over 100 setups for Saturday night.

The "official" results are shown elsewhere in this newsletter. Congratulations to the 17 observers that reported all 109 possible observations. M30 was not possible to view this year. There are a total of 38 awards to be presented, with 13 of those going to EVAC members.

A reminder to EVAC members who are in that group, and that may not have the EVAC Messier Observing Program certificate. What you completed is now a matter of record. You can complete the 110 items, and report the remaining items to our Observing Program Chairman Peter Argenziano, and claim your EVAC certificate too.

Many of the EVAC members who attended, such as myself, were working on other observing projects. We even had one member who decided to try and observe all of the Herschel 400 list in one night. I think his final count was 387. From what I have heard, everyone who attended the event had a wonderful time. Congratulations to SAC for a very successful event.

As we enter April, our "paid"

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The Backyard Astronomer
The "Pup" and Other Matters of Grave Concern
by Bill Dellinges

This week I tried to spot the white dwarf companion of Sirius. Using the finder chart in the March S&T on page 57, I plunged into deep space with grandiose expectations. It was not to be. Currently, the B component is 9" (arc seconds) at a position angle of 95°, roughly due east of Sirius, the "Dog Star." During its 50 year orbit around Sirius, the "Pup" varies in distance from its host from 2.5" (1993) to 11" (2022). Perhaps I'll have better luck next year. The main problem is glare from Sirius, the night's sky brightest star. It tends to overwhelm the 8.3 magnitude white dwarf. So, if one wishes to spy the Pup, you'll need to wait for a generous separation, very good seeing, and a decent telescope. I had only that last thing. Using powers of 90x to 700x in my 11" SCT, I could not find that little bugger. With each power, I carefully examined the general area of its position angle, taking into consideration my SCT's reversed field. I tried a moon filter to cut the glare…zilch, bupkis, nada.

The history of the Pup is one of astronomy's more interesting stories. It begins in 1844 when Friedrich Bessel was studying Sirius' proper motion and noticed its path wobbled somewhat. He predicted Sirius had an invisible companion (at least to telescopes of the day). Sidebar! This is the German astronomer who first determined the parallax – thus the

Continued on page 2

Inside this Issue:

Upcoming Events:

Local Star Party – April 3

Public Star Party – April 9

Deep Sky Star Party – April 10

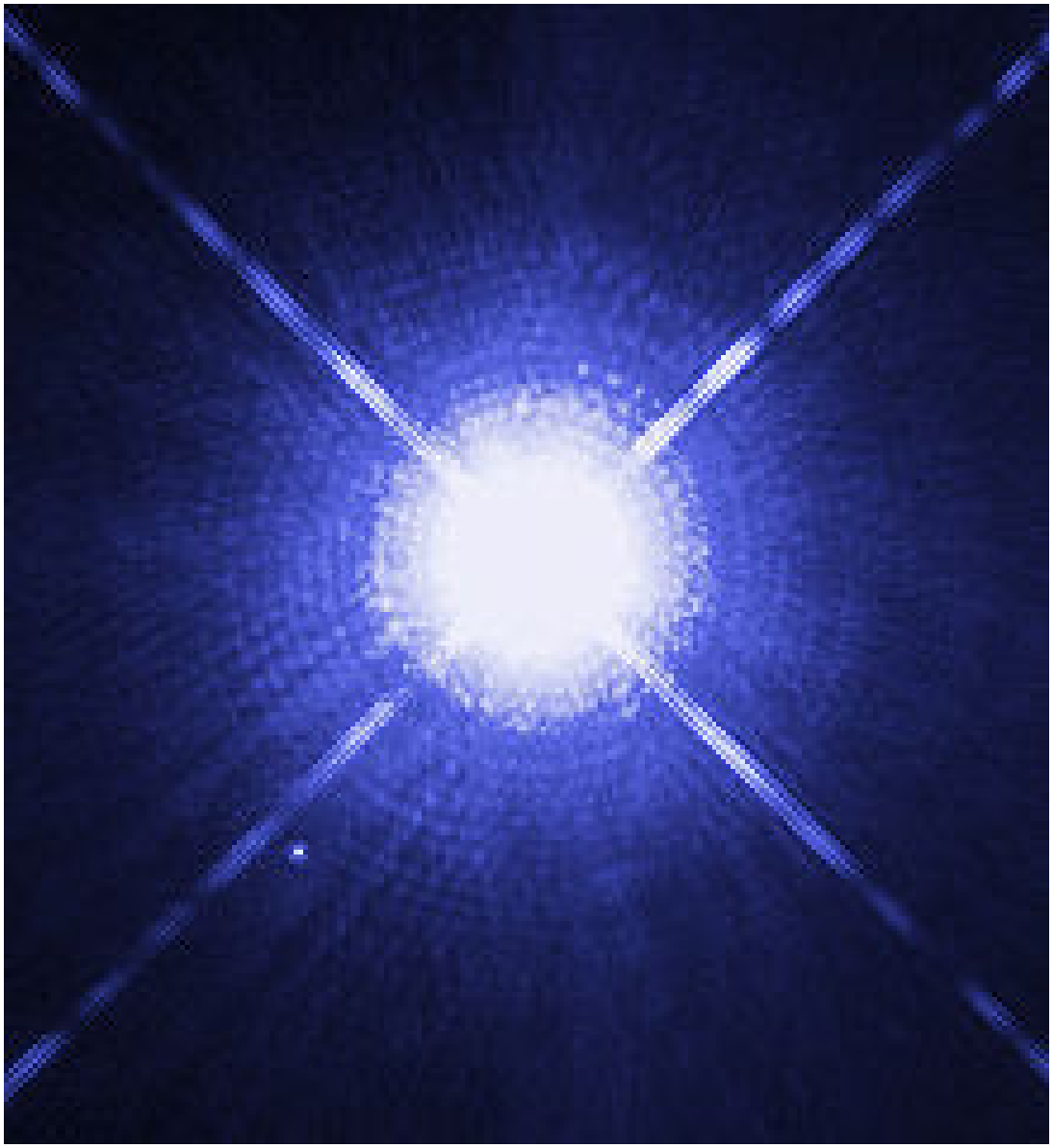
Monthly General Meeting – April 16

Check out all of the upcoming club events in the Calendars on page 8

The Backyard Astronomer

Continued from page 1 distance - to 61 Cygni, 11 light years away. He beat out Scottish astronomer Thomas Henderson and German-Russian astronomer Friedrich Wilhelm Struve by a whisker. They succeeded, respectively, in determining the distance to Alpha Centauri, 4.3 light years (1839) and Vega, 16 light years (1840).

Fast forward to 1862 (geez, weren't the 1800's great!). Alvan Clark, premier American telescope maker, was testing his new 18.5" refractor on Sirius and at first was dismayed to see what appeared to be a spot of light close to Sirius. Not a good thing when you're hoping for a clean stellar image in your new masterpiece. He soon realized all was well – he had discovered the star Bessel had predicted. Then, in 1915, American astronomer Walter Sydney Adams obtained a spectrum of Sirius B which revealed its temperature to be higher than Sirius'! For a star to be that hot, yet 10 magnitudes dimmer than Sirius, it would have to be very small; in fact, about the size of Earth. And to have such an effect on Sirius's motion through space, it would have to be very dense. Calculations show that a teaspoon of the Pup's material would weigh several tons. A billiard ball of the stuff would weigh 70 tons. Welcome to the world of white dwarfs: white hot from compression – no nuclear reactions going on in this collapsed star. Dwarf, because it's small. The Sun will meet this fate in about five billion years. You might want to consider getting your affairs in order.



Sirius and the Pup

Tell me something, am I the only person who, when a blue tooth person walks by apparently talking to themselves, wishes they'd step on a banana peel?

There are 88 constellations. All but two change their spelling when used in the possessive form (Orion, Orionis; Aquarius, Aquarii, etc.). Can you guess which ones? Answer at end of article. Have you ever noticed that if you have something that's been lying around for years and you finally decide to get rid of it, in a very short period of time, you'll find you have a need for that item (Darn, why did I give that away?!).

A thought occurred to me recently. If a large shield was placed between Earth and the Sun, cutting off the heat and light the Sun sends to us, how long would we have to live? I have sent this question to the Q&A department of S&T, Astronomy, and Stardate magazines. Keep an eye out for the answer.

Having reached an, ahem, mature age, a few of the many frustrating aspects of senior life : standing at an opened refrigerator staring at its contents and wondering why I open the door in the first place. Ditto; why did I walk into this room? The alarming number of pills I now have to take. The never ending battle against entropy – there are so many things out of place that need to be put back where they're suppose to be. My back will not allow me to dig a hole big enough to plant a tree any longer – I have to hire someone to do that now.

What are the six biggest constellations, square degrees wise? In descending order beginning with the largest: Hydra, Virgo, Ursa Major, Cetus, Hercules and Eridanus. A handy mnemonic to remember them by is "Hate Viewing Under Clouds Hiding Earth." There is no charge to use the eclectic information above to improve your quality of life.

Answer to constellation question: Camelopardalis and Puppis.

An Avalanche of Dark Asteroids

by Dauna Coulter

Imagine you're a Brontosaurus[1] with your face in a prehistoric tree top, munching on fresh leaves. Your relatives have ruled planet Earth for more than 150 million years. Huge and strong, you feel invincible. You're not.

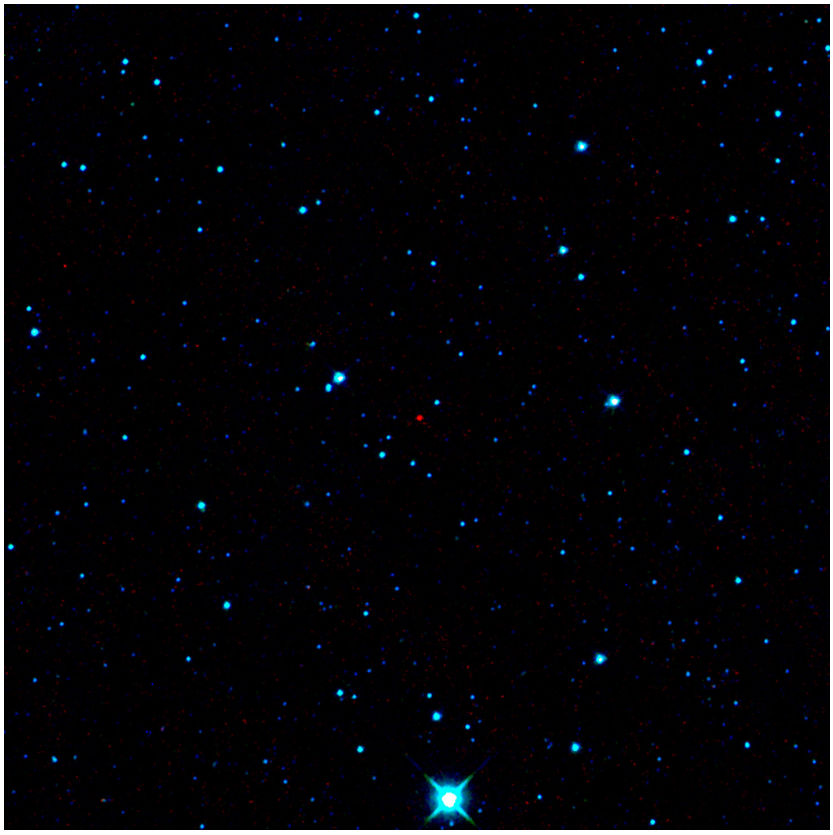
Fast forward about 65 million years. A creature much smaller and weaker dominates the Earth now, with brains instead of brawn. Its brain is a lot larger than yours relative to its body size – plenty big enough to conceive a way to scan the cosmos for objects like the colossal asteroid that wrought the end of your kind.

The creature designed and built WISE, NASA's Wide-field Infrared Survey Explorer, to search for "dark" objects in space like brown dwarf stars, vast dust clouds, and your nemesis – asteroids. WISE finds them by sensing their heat in the form of infrared light most other telescopes can't pick up.

"Our instrument is finding [dozens] of asteroids every day that were never detected before," says Ned Wright, principal investigator for WISE and a physicist at the University of California in Los Angeles. "WISE is very good at this kind of work."

Visible-light telescopes conducting past asteroid surveys may have missed a large population of darker asteroids that WISE is now flushing out of hiding. Most of the asteroids WISE is finding are in the main asteroid belt between Mars and Jupiter, but a fraction of them are different - they're the kind of Earth-approaching asteroids that send shivers all the way down a Brontosaurus' spine.

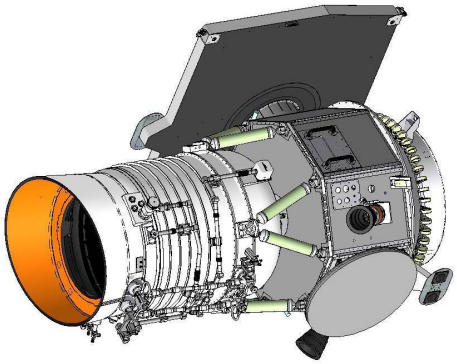
"WISE has only been in orbit for about three months, but we've already found a handful of asteroids classified as 'potentially hazardous,' including one seen in 1996 but lost until re-observed by WISE. To be named 'potentially hazardous,' an asteroid has to pass within about 5 million miles of Earth's orbit. One of our discoveries will cross Earth's orbit less than 700,000 miles away."



The red dot at the center of this image is the first near-Earth asteroid discovered by NASA's Wide-Field Infrared Survey Explorer, or WISE -- an all-sky mapping infrared mission designed to see all sorts of cosmic objects.

WISE tracks each potentially hazardous near-Earth object (NEO) it finds for an average of 30 hours and then produces a "short track" predicting where it will be for the next few weeks. The WISE team sends all of this information to the NASA-funded Minor Planet Center in Boston. They post it on a publicly available NEO confirmation page, where scientists and amateur astronomers alike can continue to track the asteroid.

An artist's concept of NASA's Wide-field Infrared Survey Explorer (WISE).



The asteroid that wiped out the dinosaurs was big - about 6 miles or 10 km in diameter. The chances of a similar hit in modern times are remote, but that doesn't mean we're out of the woods. Smaller asteroids are fairly common, and they can do damage, too. As recently as 1908, for instance, an asteroid some tens of meters across exploded over Tunguska, Russia, wiping out eight hundred square miles of remote forest.

"Regional damage from a small asteroid strike can be very serious indeed," says Wright. "We need to keep surveying the skies to find these NEOs and precisely measure their orbits. If we can find the really dangerous asteroids early enough, we might have time to figure out how to deal with them."

Many telescopes on Earth are already searching. Notable programs include LINEAR, the Catalina Sky Survey, Spacewatch, NEAT and LONEOS, among others. Working together over the years they have found more than a thousand potentially hazardous asteroids.

WISE's contribution to the total will be impressive. Between now and late October, when the mission is slated to end, Wright estimates the observatory will find a hundred thousand asteroids, mostly in the main belt, and hundreds of near Earth objects.

Those are numbers even a Brontosaurus could appreciate.

[1]Brontosaurus is a popular but now scientifically obsolete synonym for Apatosaurus.

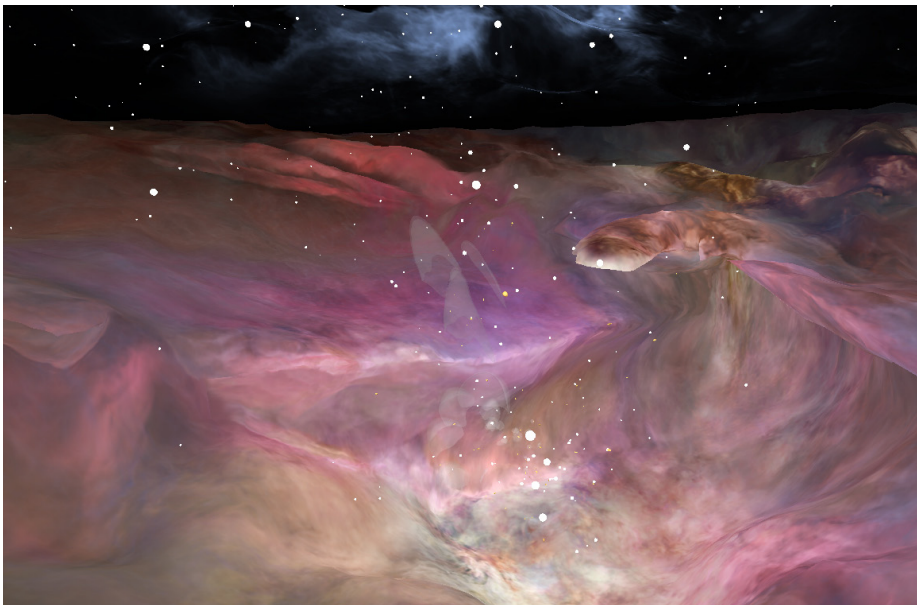
Article courtesy of Science@NASA

Experience Hubble's Universe in 3D

News Release Number: STScI-2010-12

Take an exhilarating ride through the Orion Nebula, a vast star-making factory 1,500 light-years away. Swoop through Orion's giant canyon of gas and dust. Fly past behemoth stars whose brilliant light illuminates and energizes the entire cloudy region. Zoom by dusty tadpole-shaped objects that are fledgling solar systems.

This virtual space journey isn't the latest video game but one of several groundbreaking astronomy visualizations created by specialists at the Space Telescope Science Institute (STScI) in Baltimore, the science operations center for NASA's Hubble Space Telescope. The cinematic space odysseys are part of the new Imax film "Hubble 3D," which opened March 19th at select Imax theaters worldwide.



The 43-minute movie chronicles the 20-year life of Hubble and includes highlights from the May 2009 servicing mission to the Earth-orbiting observatory, with footage taken by the astronauts.

The giant-screen film showcases some of Hubble's breathtaking iconic pictures, such as the Eagle Nebula's "Pillars of Creation," as well as stunning views taken by the newly installed Wide Field Camera 3.

While Hubble pictures of celestial objects are awe-inspiring, they are flat 2-D photographs. For this film, those 2-D images have been converted into 3-D environments, giving the audience the impression they are space travelers taking a tour of Hubble's most popular targets.

"A large-format movie is a truly immersive experience," says Frank Summers, an STScI astronomer and science visualization specialist who led the team that developed the movie visualizations. The team labored for nine months, working on four visualization sequences that comprise about 12 minutes of the movie.

"Seeing these Hubble images in 3-D, you feel like you are flying through space and not just looking at picture postcards," Summers continued. "The spacescapes are all based on Hubble images and data, though some artistic license is necessary to produce the full depth of field needed for 3-D."

The most ambitious sequence is a four-minute voyage through the Orion Nebula's gas-and-dust canyon, about 15 light-years across. During the ride, viewers will see bright and dark, gaseous clouds; thousands of stars, including a grouping of bright, hefty stars called the Trapezium; and embryonic planetary systems. The tour ends with a detailed look at a young circumstellar disk, which is much like the structure from which our solar system formed 4.5 billion years ago.

Based on a Hubble image of Orion released in 2006, the visualization was a collaborative effort between science visualization specialists at STScI, including Greg Bacon, who sculpted the Orion Nebula digital model, with input from STScI astronomer Massimo Roberto; the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign; and the Spitzer Science Center at the California Institute of Technology in Pasadena.

For some of the sequences, STScI imaging specialists developed new techniques for transforming the 2-D Hubble images into 3-D. STScI image processing specialists Lisa Frattare and Zolt Levay, for example, created methods of splitting a giant gaseous pillar in the Carina Nebula into multiple layers to produce a 3-D effect, giving the structure depth. The Carina Nebula is a nursery for baby stars.

Frattare painstakingly removed the thousands of stars in the image so that Levay could separate the gaseous layers on the isolated Carina pillar. Frattare then replaced the stars into both foreground and background layers to complete the 3-D model. For added effect, the same separation was done for both visible and infrared Hubble images, allowing the film to cross-fade between wavelength views in 3-D.

In another sequence viewers fly into a field of 170,000 stars in the giant star cluster Omega Centauri. STScI astronomer Jay Anderson used his stellar database to create a synthetic star field in 3-D that matches recent razor-sharp Hubble photos.

The film's final four-minute sequence takes viewers on a voyage from our Milky Way Galaxy past many of Hubble's best galaxy shots and deep into space. Some 15,000 galaxies from Hubble's deepest surveys stretch billions of light-years across the universe in a 3-D sequence created by STScI astronomers and visualizers. The view dissolves into a cobweb that traces the universe's large-scale structure, the backbone from which galaxies were born.

In addition to creating visualizations, STScI's education group also provided guidance on the "Hubble 3D" Educator Guide, which includes standards-based lesson plans and activities about Hubble and its mission. Students will use the guide before or after seeing the movie.

"The guide will enhance the movie experience for students and extend the movie into classrooms," says Bonnie Eisenhamer, STScI's Hubble Formal Education manager.

April Guest Speaker: James Rhoads

Dr. James Rhoads, Associate Professor in the School of Earth and Space Exploration at Arizona State University, earned his Ph.D. from Princeton University in 1997.

James Rhoads studies galaxy formation, galaxy evolution, the reionization of intergalactic hydrogen by early galaxies. He also studies the nature of gamma-ray bursters through the physics and phenomenology of their long wavelength afterglow emission. His studies of distant galaxies include surveys to identify Lyman-alpha emitting galaxies through narrowband imaging, and to study their physical nature, using ground-based telescopes in Arizona and Chile, along with the Hubble Space Telescope and Chandra X-ray Observatory.

◑ Last Quarter Moon on April 6 at 02:38

○ New Moon on April 14 at 05:30

◐ First Quarter Moon on April 21 at 11:20

● Full Moon on April 28 at 05:20

The University of Texas McDonald Observatory cordially invites you to explore

Black Hole Encyclopedia

http://blackholes.stardate.org/

The Black Hole Encyclopedia has been compiled by StarDate in partnership with The University of Texas' Karl Gebhardt, one of the leading black hole researchers in the world. Our Black Hole Encyclopedia is a unique website that offers all of the latest news on black holes, as well as radio programs, feature articles, student activities and FAQ's. The glossary of terms and additional book and website suggestions can also serve as helpful tools for anyone looking for more information on black holes or just astronomy lovers in general.

Classified Ads

ASUS Eee PC 1000HA 10" Netbook

This little netbook is at home at home, school or on the road. Included is a Windows system restore disc, AC adapter and neoprene case. I'll also include ***Sky Tools 2*** software with the real-time option ($100 value) - retail CD included. Note that netbooks don't have a disc drive - you'll need an external one, or load software from USB drives. Paid $400 with memory upgrade at Fry's last May. Will sell it for ***only $205*** - less than half of replacement cost!

Peter Argenziano news@evaconline.org

- Intel Atom N270 CPU (1.6 GHz)
- Intel GMA 950 Chipset
- 2 GB DDR2 PC6400 RAM
- 160 GB Hard Drive
- 10" 1024x600 WSVGA LED backlit LCD display
- Integrated WiFi (802.11 b/g)
- 3 USB ports, VGA, audio, mic, SD card reader, 10/100 Ethernet
- Integrated 1.3 MP webcam
- 7.4v, 6600 mAh, 6-cell battery
- Windows XP Home operating system
- Size: 10½" x 7½" x 1½", weighs just over 3 pounds

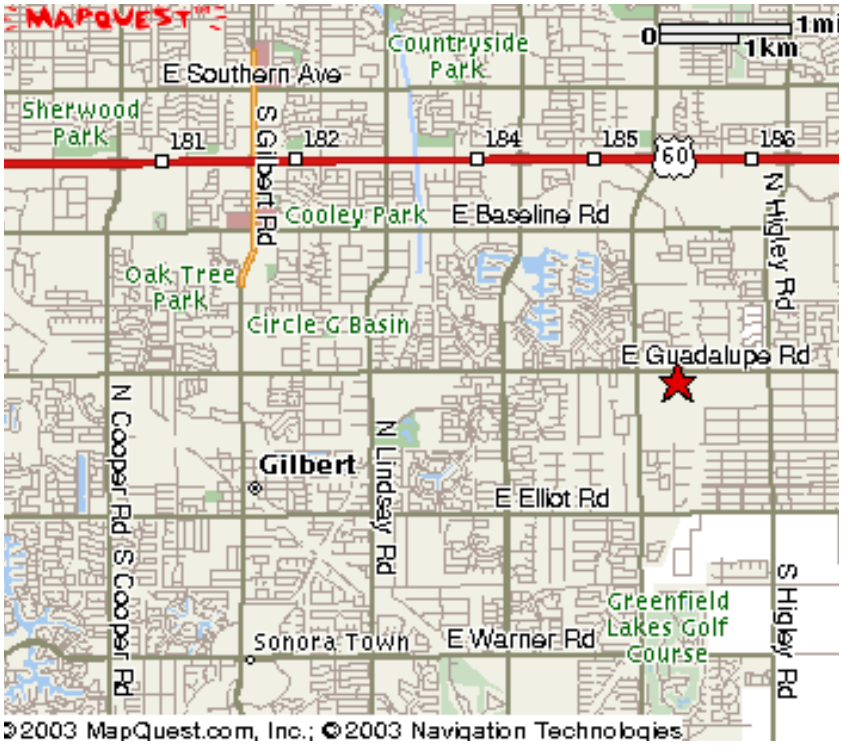
Celestron Ultima 8

Celestron 8" SCT. Heavy Duty photographer's scope with Periodic Error Correction that computer duplicates the first two minutes of hand guiding. Includes Sky Wizard computerized setting circles, tripod with bag, foam lined scope and accessories case, Celestron Ultima series eyepieces, in 4mm, 5mm, 7.5mm, 10mm, 18 mm, and 30 mm, motorized RA, Dec and Focus, manuals, star maps, books, planisphere.

$1300.

Mike Sargeant 480-839-3209

www.eastvalleyastronomy.org/grco/obs.asp

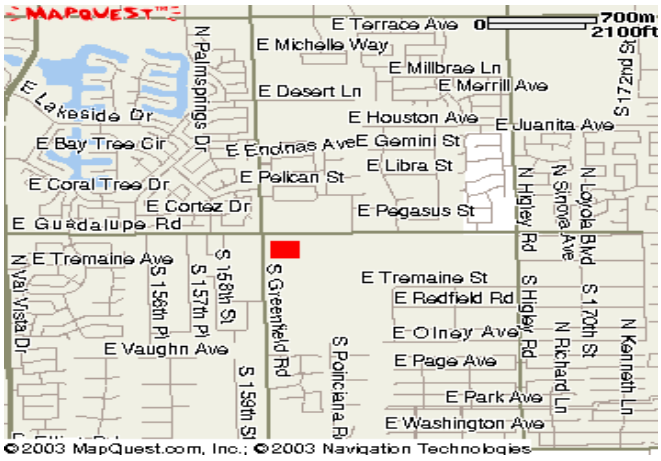


The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Road; on the southeast corner of Greenfield and Guadalupe Roads.

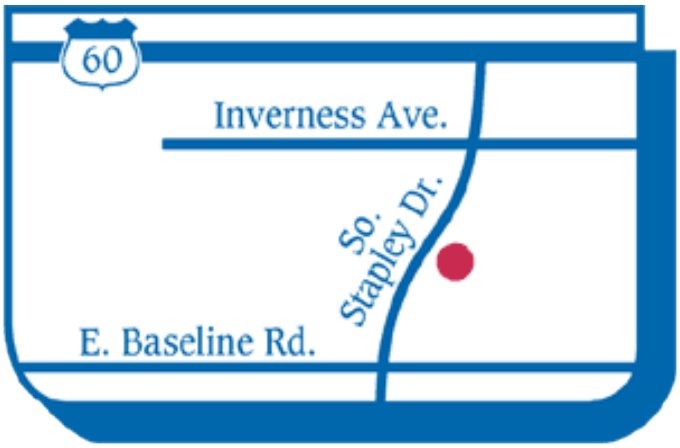
Meetings begin at 7:30 pm.

Visitors are always welcome!



Upcoming Meetings

April 16
May 21
June 18
July 16
August 20
September 17



Southeast Regional Library
775 N. Greenfield Road
Gilbert, Az. 85234

All are welcome to attend the pre-meeting dinner at 5:30 pm. We meet at Old Country Buffet, located at 1855 S. Stapley Drive in Mesa. The restaurant is in the plaza on the northeast corner of Stapley and Baseline Roads, just south of US60.

Old Country Buffet
1855 S. Stapley Drive
Mesa, Az. 85204

Likewise, all are invited to meet for coffee and more astro talk after the meeting at Denny's on Cooper (Stapley), between Baseline and Guadalupe Roads.

Denny's
1368 N. Cooper
Gilbert, Az. 85233

April 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	**3**
4	5	**6**	7	8	**9**	**10**
11	12	13	14	15	**16**	17
18	19	20	21	22	**23**	24
25	26	27	28	29	30	

April 3 - Boyce Members & Local Star Party at Boyce Thompson Arboretum

April 6 - GRCO Day school field trip

April 6 - East Valley Academy Star Party

April 9 - Public Star Party & SkyWatch at Riparian Preserve

April 10 - Deep Sky Star Party at Vekol

April 16 - General Meeting at Southeast Regional Library

April 23 - San Tan Elementary Star Party

April 27 - Chaparral Elementary Star Party

May 2010

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	**8**
9	10	11	12	**13**	**14**	**15**
16	17	18	19	20	**21**	**22**
23	24	25	26	27	28	29
30	31					

May 8 - Local Star Party at Boyce Thompson

May 13 - Camp Friendly Pines Star Party

May 14 - Public Star Party & SkyWatch at Riparian Preserve

May 15 - Deep Sky Star Party at Vekol

May 21 - General Meeting at SE Library

May 22 - Chandler Environmental Center Star Party

East Valley Astronomy Club -- 2010 Membership Form

Please complete this form and return it to the club Treasurer at the next meeting or mail it to EVAC, PO Box 2202, Mesa, Az, 85214-2202. Please include a check or money order made payable to EVAC for the appropriate amount.

IMPORTANT: All memberships expire on December 31 of each year.

Select one of the following:

☐ New Member ☐ Renewal ☐ Change of Address

New Member Dues (dues are prorated, select according to the month you are joining the club):

☐ **$30.00 Individual** January through March

☐ **$35.00 Family** January through March

☐ **$15.00 Individual** July through September

☐ **$17.50 Family** July through September

☐ **$22.50 Individual** April through June

☐ **$26.25 Family** April through June

☐ **$37.50 Individual** October through December

☐ **$43.75 Family** October through December

Includes dues for the following year

Renewal (current members only):

☐ **$30.00 Individual** ☐ **$35.00 Family**

Magazine Subscriptions (include renewal notices):

☐ **$34.00** Astronomy ☐ **$33.00** Sky & Telescope

Name Badges:

☐ **$10.00** Each (including postage) Quantity: _____

Name to imprint: _____

Total amount enclosed: ☐

Please make check or money order payable to EVAC

☐ Payment was remitted separately using PayPal ☐ Payment was remitted separately using my financial institution's online bill payment feature

Name: ☐ Phone: ☐

Address: ☐ Email: ☐

☐ Publish email address on website

City, State, Zip: ☐ URL: ☐

How would you like to receive your monthly newsletter? (choose one option):

☐ Electronic delivery (PDF) *Included with membership* ☐ US Mail **Please add $10 to the total payment**

Areas of Interest (check all that apply):

☐ General Observing ☐ Cosmology

☐ Lunar Observing ☐ Telescope Making

☐ Planetary Observing ☐ Astrophotography

☐ Deep Sky Observing ☐ Other

Please describe your astronomy equipment:

Would you be interested in attending a beginner's workshop? ☐ Yes ☐ No

How did you discover East Valley Astronomy Club? ☐

PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org

All members are required to have a liability release form (waiver) on file. Please complete one and forward to the Treasurer with your membership application or renewal.

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC") I hereby affirm that I and my family agree to hold EVAC harmless from any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), which may directly or indirectly be connected to EVAC and/or my presence on the premises of any EVAC Star Party and related areas.

I further agree to indemnify any party indicated above should such party suffer any claims, liabilities, losses, demands, causes of action, suits and expenses (including attorney fees), caused directly or indirectly by my negligent or intentional acts, or failure to act, or if such acts or failures to act are directly or indirectly caused by any person in my family or associates while participating in an EVAC Star Party.

My signature upon this form also indicates agreement and acceptance on behalf of all minor children (under 18 years of age) under my care in attendance.

EVAC only recognizes those who are members or invitees and who also have a signed Liability Release Form on file as participants at an EVAC Star Party.

Please print name here

Date

Please sign name here

PO Box 2202
Mesa, AZ 85214-2202
www.eastvalleyastronomy.org

NASA's Space Place

Deadly Planets

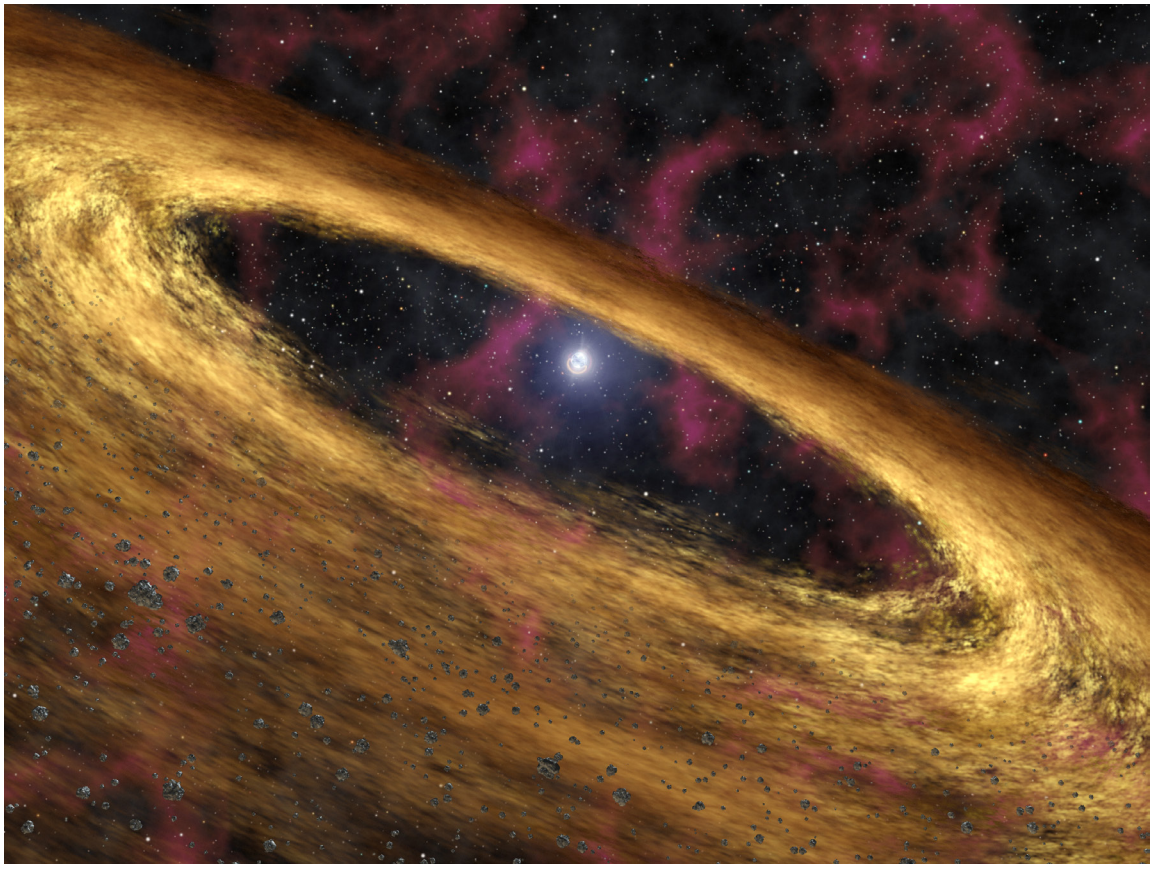
by Patrick L. Barry and Dr. Tony Phillips

About 900 light years from here is a rocky planet not much bigger than Earth. It goes around its star once every hundred days, a trifle fast, but not too different from a standard Earth-year. At least two and possibly three other planets circle the same star, forming a complete solar system.

Interested? Don't be. Going there would be the last thing you ever do.

The star is a pulsar, PSR 1257+12, the seething-hot core of a supernova that exploded millions of years ago. Its planets are bathed not in gentle, life-giving sunshine but instead a blistering torrent of X-rays and high-energy particles.

"It would be like trying to live next to Chernobyl," says Charles Beichman, a scientist at JPL and director of the Michelson Science Center at Caltech.



Artist's concept of a pulsar and surrounding disk of rubble called a "fallback" disk, out of which new planets could form.

Our own Sun emits small amounts of pulsar-like X-rays and high energy particles, but the amount of such radiation coming from a pulsar is "orders of magnitude more," he says. Even for a planet orbiting as far out as the Earth, this radiation could blow away the planet's atmosphere, and even vaporize sand right off the planet's surface.

Astronomer Alex Wolszczan discovered planets around PSR 1257+12 in the 1990s using Puerto Rico's giant Arecibo radio telescope. At first, no one believed worlds could form around pulsars—it was too bizarre. Supernovas were supposed to destroy planets, not create them. Where did these worlds come from?

NASA's Spitzer Space Telescope may have found the solution. In 2005, a group of astronomers led by Deepto Chakrabarty of MIT pointed the infrared telescope toward pulsar 4U 0142+61. Data revealed a disk of gas and dust surrounding the central star, probably wreckage from the supernova. It was just the sort of disk that could coalesce to form planets!

As deadly as pulsar planets are, they might also be hauntingly beautiful. The vaporized matter rising from the planets' surfaces could be ionized by the incoming radiation, creating colorful auroras across the sky. And though the pulsar would only appear as a tiny dot in the sky (the pulsar itself is only 20-40 km across), it would be enshrouded in a hazy glow of light emitted by radiation particles as they curve in the pulsar's strong magnetic field.

Wasted beauty? Maybe. Beichman points out the positive: "It's an awful place to try and form planets, but if you can do it there, you can do it anywhere."

Find more news and images from Spitzer at http://www.spitzer.caltech.edu/ . In addition, The Space Place Web site features several games related to Spitzer and infrared astronomy, as well as a storybook about a girl who creamed of finding another Earth. Go to http://tiny.cc/lucy208.

This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

If It's Clear...

by Fulton Wright, Jr.
Prescott Astronomy Club

April 2010

Celestial events customized (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) for Prescott, Arizona. All times are Mountain Standard Time.

On Thursday, April 1, about 7:45 PM, you can see Venus and Mercury near each other. With binoculars, look low in the west for the pair. Venus (magnitude -4) will be easy to see. Mercury (magnitude -1), to the lower right, will be harder. They will be near each other for the next couple of weeks.

On Monday, April 5, it is last quarter Moon, which rises at 1:48 AM (April 6).

On Tuesday, April 13, it is new Moon so you have all night to hunt for faint fuzzies.

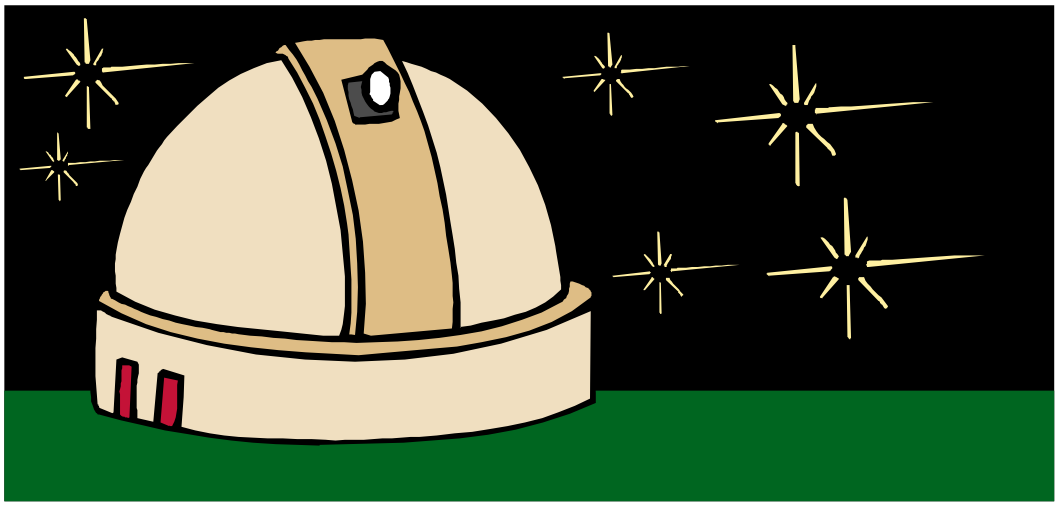
On Thursday, April 15, about 7:45 PM, you can see the Moon join Venus and Mercury which have been near each other, low in the west, for the last 2 weeks. The Moon will be a very thin crescent above Mercury.

On Saturday, April 17, about 8:30 PM, you can see a comet near a star cluster. With a medium (6 inch) telescope at low power, look 25 degrees above the west point of the horizon for the cluster NGC 1647 (magnitude 6.4) and the comet C/2009 O2 (Catalina) (magnitude 9). The very thin crescent Moon is 6 degrees to the right.

On Wednesday, April 21, the Moon is 1st quarter phase and near The Beehive Cluster and Mars. Near the north end of the terminator (line separating the light and dark parts of the Moon) the sun should just be rising on the crater Plato. Just south of the Moon's equator there is a series of 3 craters, Ptolemaeus with a flat floor, Alphonsus with a small central peak, and Arzachel with a big central peak. Just south and a little west (left) of these craters, the straight wall should be coming into view. The Moon sets that night at 2:00 AM (April 22). Tomorrow evening (the 22nd) check out Copernicus (near the intersection of the equator and the terminator), Clavius (the big crater with the string of small craters in it, near the south pole), and Tycho (just north of Clavius).

On Tuesday, April 27, at 6:47 PM (23 minutes before sunset), the full Moon rises, spoiling any chance of looking for faint fuzzies that night.

On Wednesday, April 28, after about 10:00 PM, your can see the north-east part of the Moon at it's best. Libration tips this part of the Moon toward us. Notice particularly Mare Crisium, the large round dark mare, near the top of the Moon on the right, and Endymion, a small crater with a dark, flat floor, much like the carter Plato, on the left.



From the Desk of the President

Continued from page 1

membership is now at 153 members. There are still about 55 members whose memberships expired on December 31st that have not renewed. If you are one of the 55, we hope you will visit with our Treasurer before the meetings, or during the breaks, and catch up on your dues. If you prefer, there is always the PayPal method from the website.

Tom Polakis provided EVAC with an excellent presentation on Solar System imaging at the March meeting. Bob Birket, who has shared many of his wonderful DSO images with us on EVACONLINE, is working on a multi-month presentation series for DSO imaging. This series will start at the June pre-meeting training session. Martin Thompson will be providing GRCO certification and re-certification classes at the April and May training sessions.

The weather is sure getting nice. It is time to get out and enjoy the Arizona skies. Keep Looking Up!

2010 All Arizona Messier Marathon Results

2010 All Arizona Messier Marathon Results

num	name	scope	organ.	notes
109	Micah Abel	10" Dob	n/a	M30
109	Salvador Aguirre	10" Dob	(1)	M30
109	Lynn Blackburn	120mm ref	SAC	M30
109	Steve Dodder	20" Dob	SAC	M30
109	Claude Haynes	10" Dob	EVAC	M30
109	Jack Jones	20" Dob	SAC	M30
109	Greg Kettell	111mm ref	(2)	M30
109	Sid Leach	14.5" Dob	n/a	M30
109	Paul Lind	14.5" Dob	SAC	M30
109	Joan McGue	8" Dob	SAC	M30
109	Jimmy Ray	11" SCT	SAC	M30
109	George Robinson	10" Dob	(3,4)	M30
109	Ken Sikes	16" Dob	n/a	M30
109	Scott Tannehill	12" Dob	EVAC	M30
109	Rick Tejera	60mm ETX	SAC	M30
109	Wayne Thomas	11" SCT	EVAC/SAC	M30
109	Ray Vorbeck	8" SCT	SAC	M30
108	Howard Anderson	10" SCT	EVAC/SAC	M30 M74
108	Cal Drake	10" Dob	(5)	M30 M74
108	Dean Oertle	10" Dob	(6)	M30 M72
108	Rick Rotramel	10" Newt	SAC	M30 M72
108	David Trogan	8" SCT	EVAC	M30 M72
107	Ray Heinle	12" SCT	EVAC	M30 M72 M73
107	Jon Koester	10" SCT	EVAC	M30 M72 M73
107	Bruce Monte	8" SCT	EVAC	M30 M72 M9
103	Aaron Prillama	8" Dob	SAC	M30 M72 M73 M2 M15 M75 M55
103	Scott Saari	8" Dob	SAC	M30 M72 M73 M2 M15 M75 M55
100	Derek Youngson	6" SCT	EVAC	M30 M72 M73 M2 M75 M54 M69 M103 M52 M74
98	David Kroeppler	90mm Mak	(7)	
98	Scott Kroeppler	90mm Mak	(7)	
84	David Hatch	13" Dob	EVAC	
70	Neville Cole	12" SCT	SAC	
65	Daniel Butters	10" Dob	EVAC	
65	Michelle Butters	10" Dob	EVAC	
65	Melvin Harrison	10" SCT	EVAC	
63	Christopher Vedeler	100mm ref	n/a	
62	John Krawczak	8" SCT	(8)	
55	Ken Reeves	3" Dob(9)	SAC	

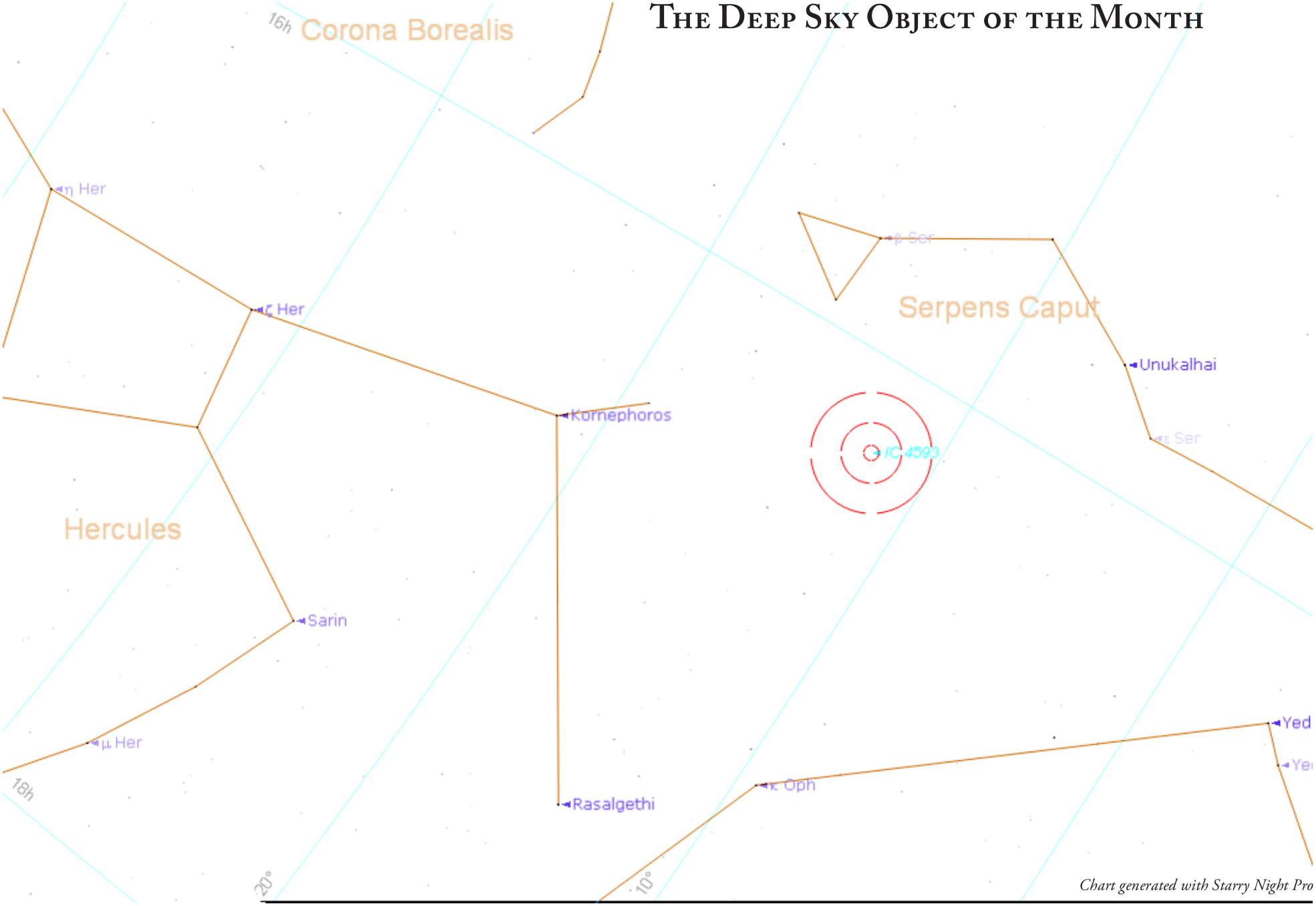
Notes

1 - Hermosillo, Mexico. Astronomical League- Member at Large /LIADA.
2 - Clifton Park, New York
3 - Auburn, CA; Astronomical League - Member at Large
4 - By memory, no chart, no Push To, no GOTO!
5 - Seattle, WA
6 - Truckee, CA; Astronomical League - Member at Large
7 - Astronomical League - Member at Large
8 - Minnetonka, MN; MN Astronomical Society
9 - Yes it was a 3" f4! I looked through it myself, not bad for a $30.00 telescope.

New EVAC Members in March

George and Gloria Powell - Gold Canyon

Andre Olivier - Chandler



IC 4593 (White-Eyed Pea) Planetary Nebula in Hercules

RA: 16h 11m 44.5s Dec: +12° 04' 17" Magnitude: 11.0 Size: 12.0"

The Multiplying Mystery of Moonwater

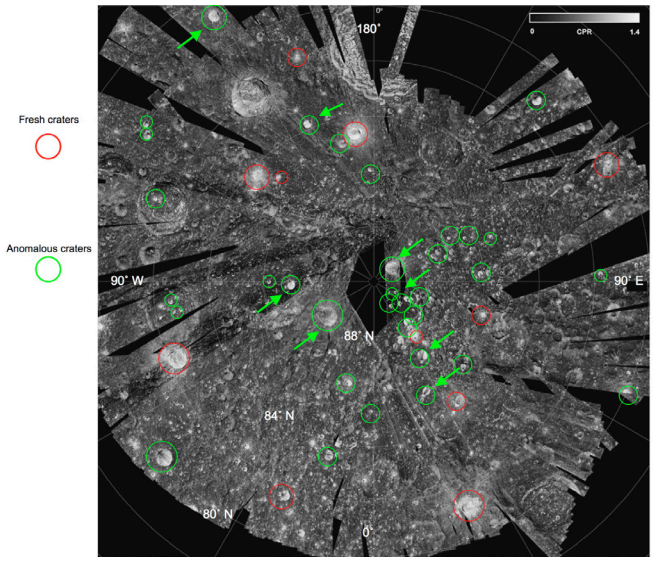
by Dauna Coulter

Moonwater. Look it up. You won't find it. It's not in the dictionary.

That's because we thought, until recently, that the Moon was just about the driest place in the solar system. Then reports of moonwater started "pouring" in – starting with estimates of scant amounts on the lunar surface, then gallons in a single crater, and now 600 million metric tons distributed among 40 craters near the lunar north pole.

"We thought we understood the Moon, but we don't," says Paul Spudis of the Lunar and Planetary Institute. "It's clear now that water exists up there in a variety of concentrations and geologic settings. And who'd have thought that today we'd be pondering the Moon's hydrosphere?"

Spudis is principal investigator of NASA's Mini-SAR team – the group with the latest and greatest moonwater "strike." Their instrument, a radar probe on India's Chandrayaan-1, found 40 craters each containing water ice at least 2 meters deep.



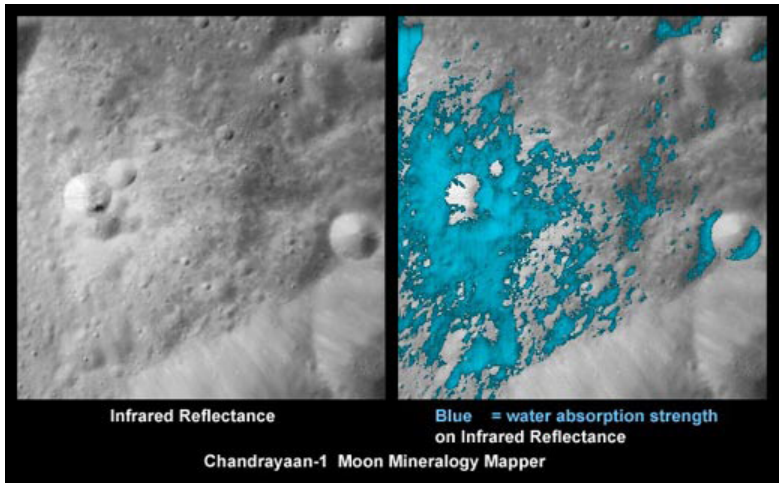
A Mini-SAR radar map of the lunar north pole. Craters circled in green are believed to contain significant deposits of frozen water.

"If you converted those craters' water into rocket fuel, you'd have enough fuel to launch the equivalent of one space shuttle per day for more than 2000 years. But our observations are just a part of an even more tantalizing story about what's going on up on the Moon."

It's the story of a lunar water cycle, and it's based on the seemingly disparate – but perhaps connectable – results from Mini-SAR and NASA's recent LCROSS mission and Moon Mineralogy Mapper (M3 or "M-cubed") instrument also on Chandrayaan-1.

"So far we've found three types of moonwater," says Spudis. "We have Mini-SAR's thick lenses of nearly pure crater ice, LCROSS's fluffy mix of ice crystals and dirt, and M-cube's thin layer that comes and goes all across the surface of the Moon."

On October 9, 2009, LCROSS, short for Lunar Crater Observation and Sensing Satellite, struck water in a cold, permanently dark crater at the lunar south pole. Since then, the science team has been thoroughly mining their data.



Shown in false-color blue, a thin layer of water-rich minerals cover an expanse of terrain around a young lunar crater. Credit: Chandrayaan-1/Moon Mineralogy Mapper.

"It looks as though at least two different layers of our crater soil contain water, and they represent two different time epochs," explains Anthony Colaprete, LCROSS principal investigator. "The first layer, ejected in the first 2 seconds from the crater after impact, contains water and hydroxyl bound up in the minerals, and even tiny pieces of pure ice mixed in. This layer is a thin film and may be relatively 'fresh,' perhaps recently replenished."

According to Colaprete, this brand of moonwater resembles the moonwater M3 discovered last year in scant but widespread amounts, bound to the rocks and dust in the very top millimeters of lunar soil.

The second layer is different. "It contains even more water ice plus a treasure chest of other compounds we weren't even looking for," he says. "So far the tally includes sulfur dioxide (SO2), methanol (CH3OH), and the curious organic molecule diacetylene (H2C4). This layer seems to extend below at least 0.5 meters and is probably older than the ice we're finding on the surface."

They don't know why some craters contain loads of pure ice while others are dominated by an ice-soil mixture. It's probably a sign that the moonwater comes from more than one source.

"Some of the water may be made right there on the Moon," says Spudis. "Protons in the solar wind can make small amounts of water continuously on the lunar surface by interacting with metal oxides in the rocks. But some of the water is probably deposited on the Moon from other places in the solar system."

The Moon is constantly bombarded by impactors that add to the lunar water budget. Asteroids contain hydrated minerals, and comet cores are nearly pure ice.

The researchers also think that much of the crater water migrates to the poles from the Moon's warmer, lower latitudes. "All our findings are telling us there's an active water cycle on the Moon," marvels Colaprete.

Think about it. The "driest place in the solar system" has a water cycle.

"It's a different world up there," says Spudis, "and we've barely scratched the surface. Who knows what discoveries lie ahead?"

Moonwater. Add it to the dictionary.

Article courtesy of Science@NASA

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Keep Looking Up!

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