Volume 25 Issue 4

April 2011

The Observer

East Valley Astronomy Club

From the Desk of the President

by Steven Aggas

It is with sadness that I inform those in the club who have not yet heard of the passing of Randy Peterson. He led EVAC's outreach program and for his tremendous efforts Tom and Jenn Polakis had an asteroid named in his honor. He also completed the Astronomical League's Hershel 400, which is no small feat considering one must not only see but also draw every one of its objects. I had the privilege to observe with him on several occasions, he will be missed…

The main speaker at the general assembly meeting will be Dr. Rolf A. Jansen, Arizona State University Research Scientist. As a MAG Dark Sky Stakeholder he will be talking about MAG and about his work in Extra-galactic Astronomy & Cosmology. With more and more amateurs setting up remote systems in dark locations (like what last month's meeting speaker Bernard Miller did) or driving to dark skies (like what most of us do), it sure would be nice to see a turn in the tide of light pollution. So mark April 15th on your calendars to hear about the Dark Sky Stakeholders Group. Also at the April general assembly meeting we'll be conducting the auction! Claude Haynes has offered to conduct the auction, so be there to get a great scope (it'll need a little work, ok, maybe a lot)!

One last time I'll mention SAC's upcoming Messier Marathon! It's going to be on April 2nd this year at the Hovatter Airstrip. See the SAC website for further details and a map!

Steven Aggas
EVAC President

Randy Peterson
Aug 28, 1948 – Mar 22, 2011

The Backyard Astronomer

Spring Nuggets *by Bill Dellinges*

Where the heck did all the stars go? The pickings are mighty slim compared to the parade of grandiose winter constellations we've had the last few months.

In the spring we're no longer looking through the plane of our galaxy, where stars are more numerous, but rather ninety degrees from it towards the galactic North Pole in Coma Berenices. Thus we observe fewer stars. The same situation applies to fall when we peer down through the galaxy towards the South Galactic Pole in Sculptor.

The good news in spring and fall is that we get a better view of other galaxies now that the plane of our galaxy is out of the way, the so-called "Zone of Avoidance" (the stars, gas, and dust in the plane of the Milky Way preclude us from seeing other galaxies). If one were to step outside at 9 pm in April at mid-month and look up while facing

Continued on page 2

Upcoming Events:

All-Arizona Messier Marathon - April 2

Public Star Party - April 8

General Meeting - April 15

Local Star Party - April 23

Deep Sky Observing Night - April 30

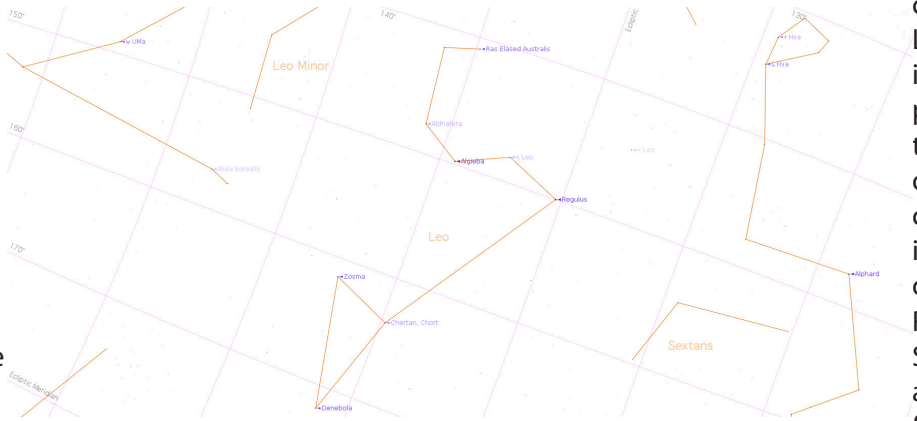
Check out all of the upcoming club events in the Calendars on page 8

Inside this Issue:

The Backyard Astronomer

Continued from page 1 south, you wouldn't see much til your eyes reached a point 70 degrees above the horizon. There you would spy an enormous lion! Well, one first magnitude star and eight second and third magnitude stars forming what could be interpreted as a lion - Leo the Lion. Other than Ursa Major to our north, it's all we got folks. This would be a good time to test your skills at tracking down the other faint constellations of spring. Take a break from observing for a few minutes and lie back in a lawn chair with a planisphere and red light and tackle Leo Minor, Cancer, Sextens, Hydra, and Coma Berenices.

Let's use Leo as our base camp to explore spring's nuggets. The brightest star in Leo is Regulus (L. "Little King"), a 1.4 magnitude star 77 light years away. It has a 7.7 magnitude companion 177" away (almost 3') at position angle 307º which can be seen in an 8x50 finder. Running north from there is a string of stars forming a backwards question mark or sickle. This asterism depicts the Lion's chest, head, and mane. The second brightest star in this asterism is Gamma Leonis or Algieba (Ar. "The forehead"), a spectacular double star comprised of magnitude 2.4 and 3.5 yellow stars separated by 4.7". Any decent telescope at 100x will split them. Four degrees southwest of the Sickle's last star, Epsilon Leonis, is a large faint galaxy, NGC 2903. East of the Sickle we find the Lion's hind quarters, a three star triangle. Its most eastern and brightest star is Denebola (Ar. "The lion's tail). West of Denebola is Theta Leonis or Chertan (Ar. "Two small ribs"), another star in the tail. Lying just over two degrees south of Chertan resides the "Leo Trio" M65, M66, and NGC 3628, three fairly bright galaxies about 30 million light years away. M65/66 can both be scooped up in a 0.9 degree field at 90x in an 11" SCT. NGC 3628, noticeably elongated, hovers at the field's edge. Though the constellations surrounding the King of Beasts are lackluster, let's see if we can find at least one redeeming nugget within them starting west of the big cat and working counterclockwise.



There is a huge area devoid of stars west of Leo. Welcome to Cancer. Comprised of a handful of fourth magnitude stars, this small constellation is hard to pick out even in a dark sky. It would be forgettable if not for one resident – M44, the Beehive Cluster. Peer carefully in the "void" and soon your eye will pick up a nebulous blob. Optical aid reveals an open cluster comprised of about 50 stars of 6th magnitude. The star cluster is 577 light years distant, making it the fifth closest star cluster to us (after the Ursa Major group – 80 LY, Hyades Cluster – 120 LY, Coma Berenices Cluster – 250 LY, and the Pleiades Cluster – 380 LY). M44 is large and best seen in binoculars. Take the time to also examine two fine double stars in Cancer, Iota and Zeta Cancri.

Just below Cancer is a faint but distinctive pentagon pattern of stars representing the head of Hydra, the Water Snake. Hydra is the largest of the 88 constellations in total square degrees, 1302.84º or 3.15% of the celestial sphere. It's the second longest constellation after Eridanus. Hydra contains the only other bright star in the region, second magnitude Alphard (Ar. "The Solitary One"). A good choice for a nugget in Hydra is NGC 3242, the "Ghost of Jupiter", a ninth magnitude planetary nebula two degrees south of Mu Hydrae. Swinging east below Leo we pass through Sextans, The Sextant, a small faint constellation created by Johannes Hevelius in 1687. Sky Atlas 2000 shows nine mediocre galaxies littering the area, but perhaps the triple star, 35 Sextantis, might be a good choice for our nugget – give it a try. The area directly east of Leo is occupied by Virgo, the second largest constellation after Hydra. Leo's tail star, Denebola, is the apex of a triangle pointing directly at the western segment of Virgo, an asterism called the Wineglass. It is filled with a plethora of galaxies, the so-called Realm of the Galaxies. So many in fact, one can actually "galaxy hop" from one to another! They are somewhat small and faint however, being members of the Virgo super cluster 60 million light years away.

Northeast of Leo, the eye can detect another blob reminiscent of M44, the nebulous patch of light west of Leo. This "blob" is the Coma Berenices Cluster anchoring the small faint three-star constellation Coma Berenices, Berenice's Hair. The cluster, also known as MEL 111, is the third nearest one to us (see the list above) and is very large, requiring a binocular with an 8º field to capture all its stars. MEL 111 certainly qualifies as a nugget but Coma Berenices offers much more. Consider pit stops at the edge-on galaxy NGC 4565, Black Eye galaxy M64, globular cluster M53, and double star 24 Comae Berenices. A good tip in learning the spring sky is to note that either side of its brightest constellation, Leo, there are large, virtually empty chunks of sky in which ghostly glows reside, Mel III to the east and M44 to the west. We complete our swing around Leo by landing on a smaller cat directly above the Lion, appropriately named Leo Minor - another act of desperation by Hevelius to fill spaces between the classic constellations with seven starry creations of questionable merit. Leo Minor lacks any nuggets to speak of. Perhaps the Great Bear to its north gobbled them up?

Randy Peterson
August 28, 1948 - March 22, 2011

Today we all mourn with Randy's wife Karol, with their sons Bryant, Stephen, Ryan and Russell, and all their extended family, knowing that their loss is personal and profound, and valuing their willingness to share him with us all.

We mourn as a community, because we know we are saying goodbye to a friend. Whether we knew Randy personally a lot, a little, or not at all, he was a central part of our astronomical family.

What is it that we remember when we think of Randy? I think everyone who knew him would agree that it was his warm and friendly personality, his genuine and unwavering desire to help those around him, and his passion for that which was important to him. That is what I will truly miss about Randy.

His values were strong; they are timeless; and they will endure.

May Randy Peterson rest in peace.

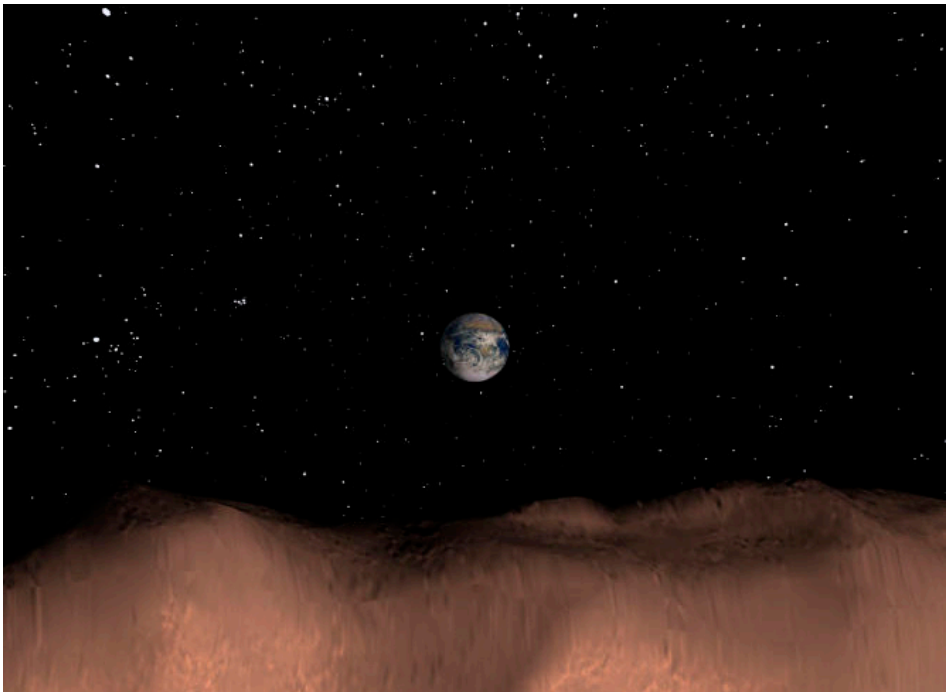
Do not stand at my grave and weep,
I am not there, I do not sleep.

I am a thousand winds that blow.
I am the diamond glint on snow.
I am the sunlight on ripened grain.
I am the gentle autumn rain.

When you wake in the morning hush,
I am the swift, uplifting rush
Of quiet birds in circling flight.
I am the soft starlight at night.

Do not stand at my grave and weep.
I am not there, I do not sleep.
(Do not stand at my grave and cry.
I am not there, I did not die!)

Mary Elizabeth Frye



Asteroid Randypeterson

Preliminary indications: 2003 SX218
Catalog number: 232553
Title: Randypeterson
Discovery date: September 26, 2003
Discovery site: Junk Bond Observatory
Discoverer: David Healy
Semi-major axis: 2.7889 AU (417,219,771 km)
Eccentricity: 0.0514
Mean daily movement: 0.2116° / day
Orbit inclination: 3.9656°
Longitude of ascending node: 198.8753°
Argument of perihelion: 107.5892°
Mean anomaly: 269.1939°
Absolute magnitude: 16.20
Number of observations: 64
Number of oppositions: 6
Last observation: February 15, 2010
Located in main asteroid belt

April Guest Speaker: Dr. Rolf A. Jansen

Dr. Rolf A. Jansen, Arizona State University Research Scientist in the School of Earth and Space Exploration (SESE), will be this month's guest speaker.

Rolf Jansen's research focuses on ground- and space-based ultraviolet–near-infrared and Hα surface photometry and spectroscopy of nearby galaxies. His aim is to study their content and to unravel their formation and assembly histories as a function of galaxy type, luminosity, and cosmic environment, and to track the hierarchical assembly of galaxies and the emergence of the Hubble sequence by z ~ 1. He serves as Instrument Scientist for a NASA concept study into a next-generation UV–optical space telescope.

He also provides computer and astronomical data analysis support within the SESE Cosmology Group.

As a MAG Dark Sky Stakeholder he will be talking about MAG and about his work in Extra-galactic Astronomy & Cosmology.

2011 All-Arizona Messier Marathon

Saturday, April 2nd, 2011

The site is new for the 2011 Marathon, and is the same site used last fall for the All-Arizona Star Party: The Hovatter Airstrip. The site is located approximately 100 miles west of central Phoenix. It is accessible by all vehicles via exit #53 on I-10. For those having GPS the coordinates are: 33° 34′ 50″ North, 113° 35′ 53″ West, elevation: 1,378 feet (420 meters).
You are also invited to come out and enjoy extra night of observing prior to the marathon. This is NO April Fool's joke. This year the day before the marathon (Friday, April 1st) has been set aside for you to observe from your own list at the new Hovatter Airstrip site. Reminder, this is not the marathon - just an extra night of dark sky observing amongst friends.
Complete details here: http://www.saguaroastro.org/content/messier2011.htm

○ New Moon on April 3 at 07:33

◐ First Quarter Moon on April 11 at 05:06

● Full Moon on April 17 at 19:45

◑ Last Quarter Moon on April 24 at 19:47

Custom Observing Chair

This chair was built for me by a local craftsman and is of the highest quality. Its construction utilizes no hardware. The seat height ranges from 18" to 40" and is extremely stable. The chair disassembles for easy transportation.

Here is your opportunity to own a truly unique observing chair. It cost me $350, but I'll let a lucky observer have it for half price... only $175.

Contact Peter: news@evaconline.org

Upcoming Meetings

April 15
May 20
June 17
July 15
August 19
September 16

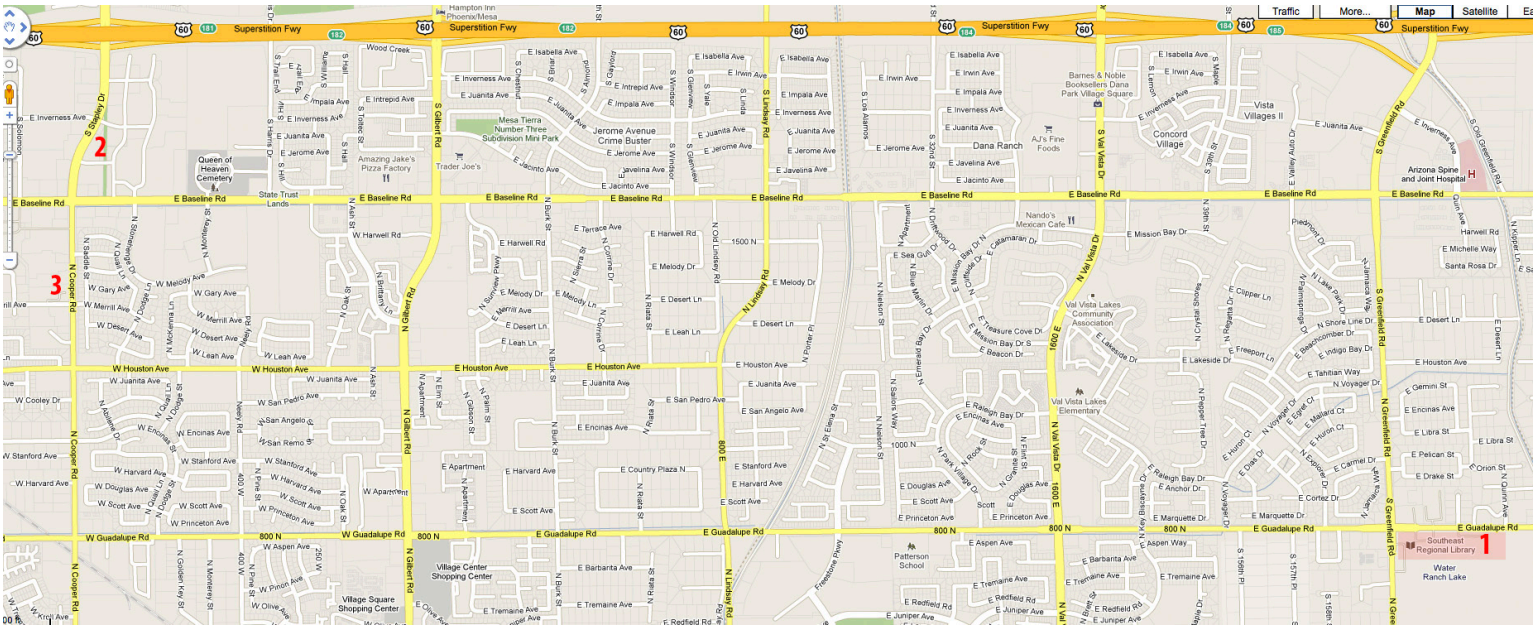
The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

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.

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.

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.

Visitors are always welcome!



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

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

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

March 2011

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		

March 1 - Taft Elementary School Star Party

March 2 - John Bosco Elementary School Star Party

March 3 - Sousa Elementary School Star Party

March 5 - Deep Sky Observing Night. Head out to your favorite dark sky site and observe!

March 11 - Public Star Party & SkyWatch at Riparian Preserve

March 18 - General Meeting at SE Library

March 26 - Local Star Party at Boyce Thompson

April 2011

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 2 - All-Arizona Messier Marathon

April 7 - Roosevelt Elementary School Star Party

April 8 - Public Star Party & SkyWatch at Riparian Preserve

April 14 - St. Mary Basha Elementary School Star Party

April 15 - General Meeting at SE Library

April 19 - Pomeroy Elementary School Star Party

April 23 - Local Star Party at Boyce Thompson Arboretum

April 29 - Evening Under the Stars at McDowell Sonoran Preserve

April 30 - Deep Sky Observing Night. Head out to your favorite dark sky site and observe!

East Valley Astronomy Club -- 2011 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**

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

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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.evaconline.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

GOES-R, Zombie Fighter

by Dr. Tony Phillips

On April 5, 2010, something eerie happened to the Galaxy 15 telecommunications satellite: It turned into a zombie.

The day began as usual, with industry-owned Galaxy 15 relaying TV signals to millions of viewers in North America, when suddenly the geosynchronous satellite stopped taking commands from Earth. It was brain dead! Like any good zombie, however, its body continued to function. Within days, Galaxy 15 began to meander among other satellites in geosynchronous orbit, transmitting its own signal on top of the others'. Satellite operators scrambled to deal with the interference, all the while wondering what happened?

In horror movies, zombies are usually produced by viruses.

"In this case, the culprit was probably the sun," says Bill Denig of the National Geophysical Data Center in Boulder, Colorado. He and colleague Janet Green of NOAA's Space Weather Prediction Center recently led a study of the Galaxy 15 anomaly, and here are their conclusions:

The Galaxy 15 communication satellite was "brainless" for several months in 2010 after being exposed to a geomagnetic storm. The new GOES-R satellite will warn of such dangers.

On April 3rd, a relatively minor solar flare launched a cloud of plasma toward Earth. Galaxy 15 had experienced many such events before, but this time there was a difference.

"Galaxy 15 was just emerging from the shadow of Earth when the cloud arrived and triggered a geomagnetic storm," explains Denig. Suddenly exposed to sunlight and the ongoing storm, "the spacecraft began to heat up and charge [up]."

Electrons swirling around Galaxy 15 stuck to and penetrated the spacecraft's surface. As more and more charged particles accumulated, voltages began to rise, and—zap!—an electrostatic discharge occurred. A zombie was born.

"At least, this is what we suspect happened based on data collected by GOES satellites in the vicinity," he says. "We'll be able to diagnose events like this much better, however, after GOES-R is launched by NASA in 2015."

GOES-R is NOAA's next-generation Geostationary Operational Environmental Satellite. One of the instruments it will carry, a low-energy electron counter, is crucial to "zombie fighting." Low energy-electrons are the ones most likely to stick to a spacecraft's surface and cause brain-frying discharges. By monitoring these particles in Earth orbit, GOES-R will provide better post-mortems for future zombie outbreaks. This could help satellite designers figure out how to build spacecraft less susceptible to discharges. Also, GOES-R will be able to issue alerts when dangerous electrons appear. Satellite operators could then take protective action—for example, putting their birds in "safe mode"—to keep the zombie population at bay.

Meanwhile, Galaxy 15 is a zombie no more. In late December 2010, after 9 months of terrorizing nearby spacecraft, the comsat was re-booted, and began responding to commands from Earth again.

All's well that ends well? True zombie fighters know better than to relax. Says Denig, "we're looking forward to GOES-R."

You and the kids in your life can learn about space weather at http://scijinks.gov/space-weather-and-us.

This article was provided by 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 2011

Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is ½ degree or 30 arcminutes in diameter. All times are Mountain Standard Time.

On Saturday, April 2, after 8:30 PM, you can easily identify Saturn's four brightest moons. Titan (magnitude 8.3) is furthest west of Saturn (up and to the right in a correct image telescope). Next toward the planet is Rhea (magnitude 9.7), then Dione (magnitude 10.4). The same distance as Dione but on the east side is Tethys (magnitude 10.2).

On Sunday, April 3, it is new Moon and you have all night to hunt for faint fuzzies.

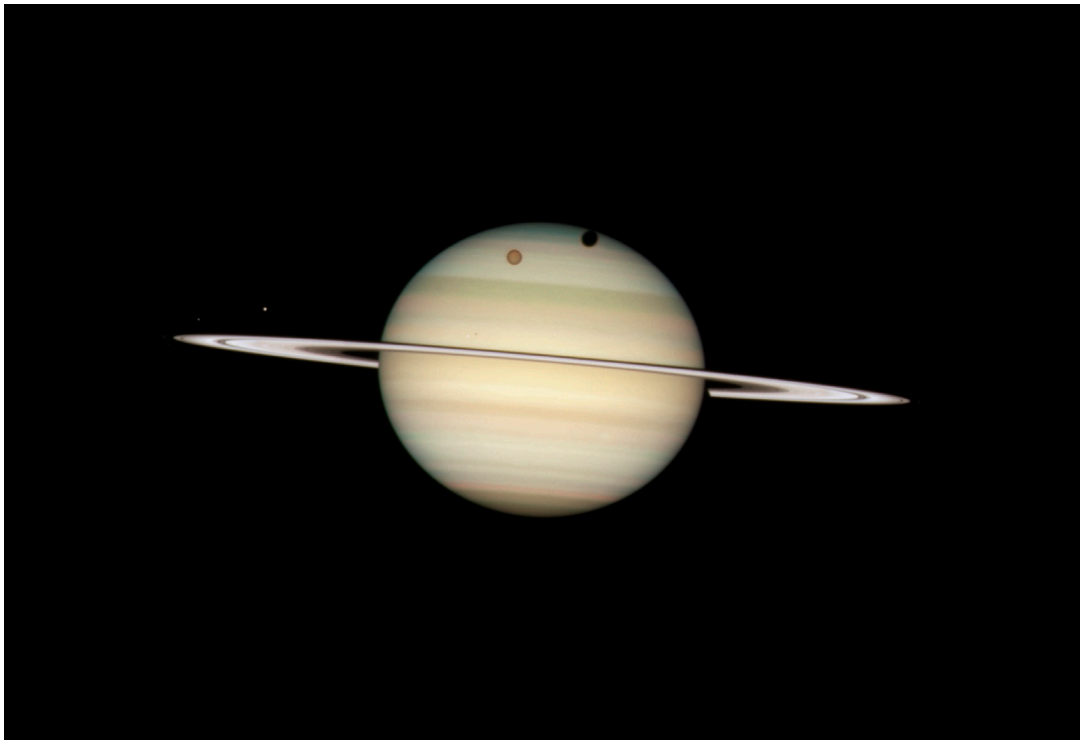
On Sunday, April 10, the Moon is at first quarter phase and sets at 1:33 AM (April 11).

On Sunday, April 17, at 7:03 PM (same as sunset) the full Moon rises, spoiling any chance of hunting for faint fuzzies all night. However libration tips the northern part of the Moon toward us at this time so a night or two before and after tonight will be a good time to study the northern edge.

Observing challange: starting about Friday, April 15, and lasting into the next month, five planets will be near each other very, very low in the east just before sunrise. Venus will be the easiest. Uranus will be impossible. Jupiter, Mercury and Mars will be difficult. On April 19 Mars and Mercury will be especially close. On April 30, Mars and Jupiter will be especially close.

On Thursday, April 21, after 8:30 PM, you can see two of Saturn's moons near each other. Rhea (magnitude 9.7) and Dione (magnitude 10.4) are about 1 ring diameter west of the rings (up and to the right in a correct image telescope). The brightest moon, Titan (magnitude 8.3) is quite a bit further west. Amazingly, the next night (April 22), Rhea and Dione are still close, but this time, on the east side of Saturn. Double amazingly, this whole sequence repeats on the nights of April 28 and 29 but with east and west in the above description reversed.

On Sunday, April 24, you can hunt for faint fuzzies until 1:37 AM (April 25) when the last quarter Moon rises.



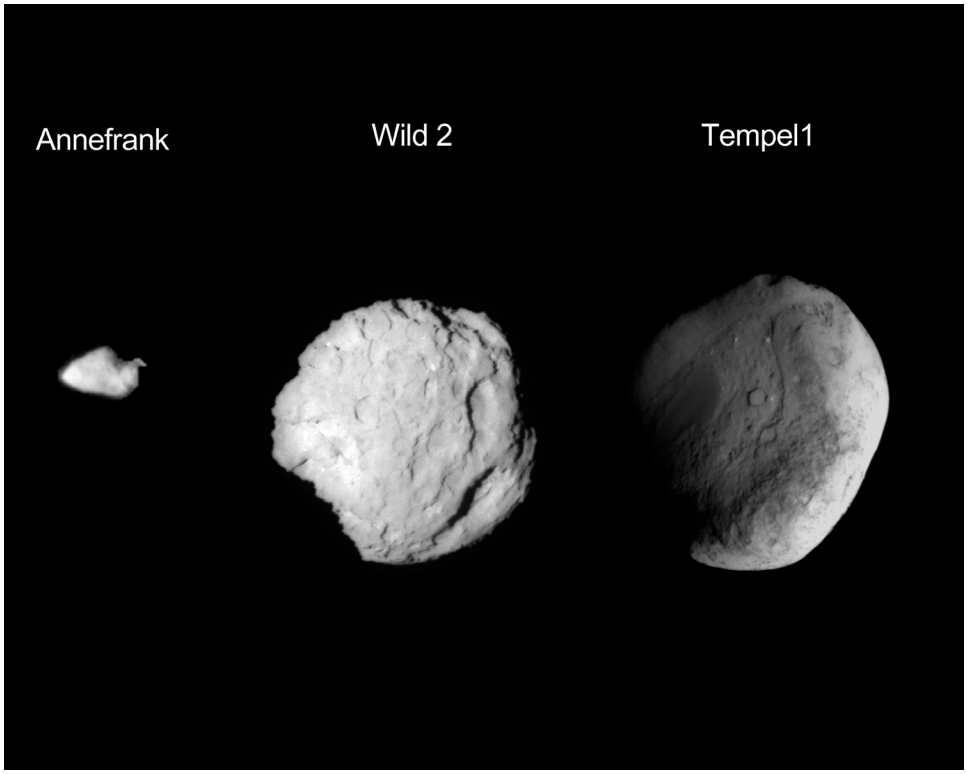
Quadruple Saturn Moon Transit

Credit: NASA, ESA, and the Hubble Heritage Team (STScI/AURA)
Acknowledgment: M.H. Wong (STScI/UC Berkeley) and C. Go (Philippines)

NASA Stardust Spacecraft Officially Ends Operations

NASA's Stardust spacecraft sent its last transmission to Earth at 7:33 p.m. EDT Thursday, March 24, shortly after depleting fuel and ceasing operations. During an 11-year period, the venerable spacecraft collected and returned comet material to Earth and was reused after the end of its prime mission in 2006 to observe and study another comet during February 2011.

The Stardust team performed the burn to depletion, because the comet hunter was literally running on fumes. The depletion maneuver command was sent from the Stardust-NExT mission control area at Lockheed Martin Space Systems in Denver. The operation was designed to fire Stardust's rockets until no fuel remained in the tank or fuel lines. The spacecraft sent acknowledgment of its last command from approximately 194 million miles away in space.



This composite image shows the three worlds NASA's Stardust spacecraft encountered during its 12 year mission. The flyby of asteroid Annefrank came on Nov.2, 2002. Comet Wild 2 was visited on Jan. 2, 2004. The comet Tempel 1 encounter occurred on Feb. 14, 2011.
Image credit: NASA/JPL-Caltech/UW/Cornell

"This is the end of the spacecraft's operations, but really just the beginnings of what this spacecraft's accomplishments will give to planetary science," said Lindley Johnson, Stardust-NExT and Discovery program executive at NASA Headquarters in Washington. "The treasure-trove of science data and engineering information collected and returned by Stardust is invaluable for planning future deep space planetary missions."

After completion of the burn, mission personnel began comparing the computed amount of fuel consumed during the engine firing with the anticipated amount based on consumption models. The models are required to track fuel levels, because there are no fully reliable fuel gauges for spacecraft in the weightless environment of space. Mission planners use approximate fuel usage by reviewing the history of the vehicle's flight, how many times and how long its rocket motors fired.

"Stardust's motors burned for 146 seconds," said Allan Cheuvront, Lockheed Martin Space Systems Company program manager for Stardust-NExT in Denver. "We'll crunch the numbers and see how close the reality matches up with our projections. That will be a great data set to have in our back pocket when we plan for future missions."

Launched Feb. 7, 1999, Stardust flew past the asteroid named Annefrank and traveled halfway to Jupiter to collect the particle samples from the comet Wild 2. The spacecraft returned to Earth's vicinity to drop off a sample return capsule eagerly awaited by comet scientists.

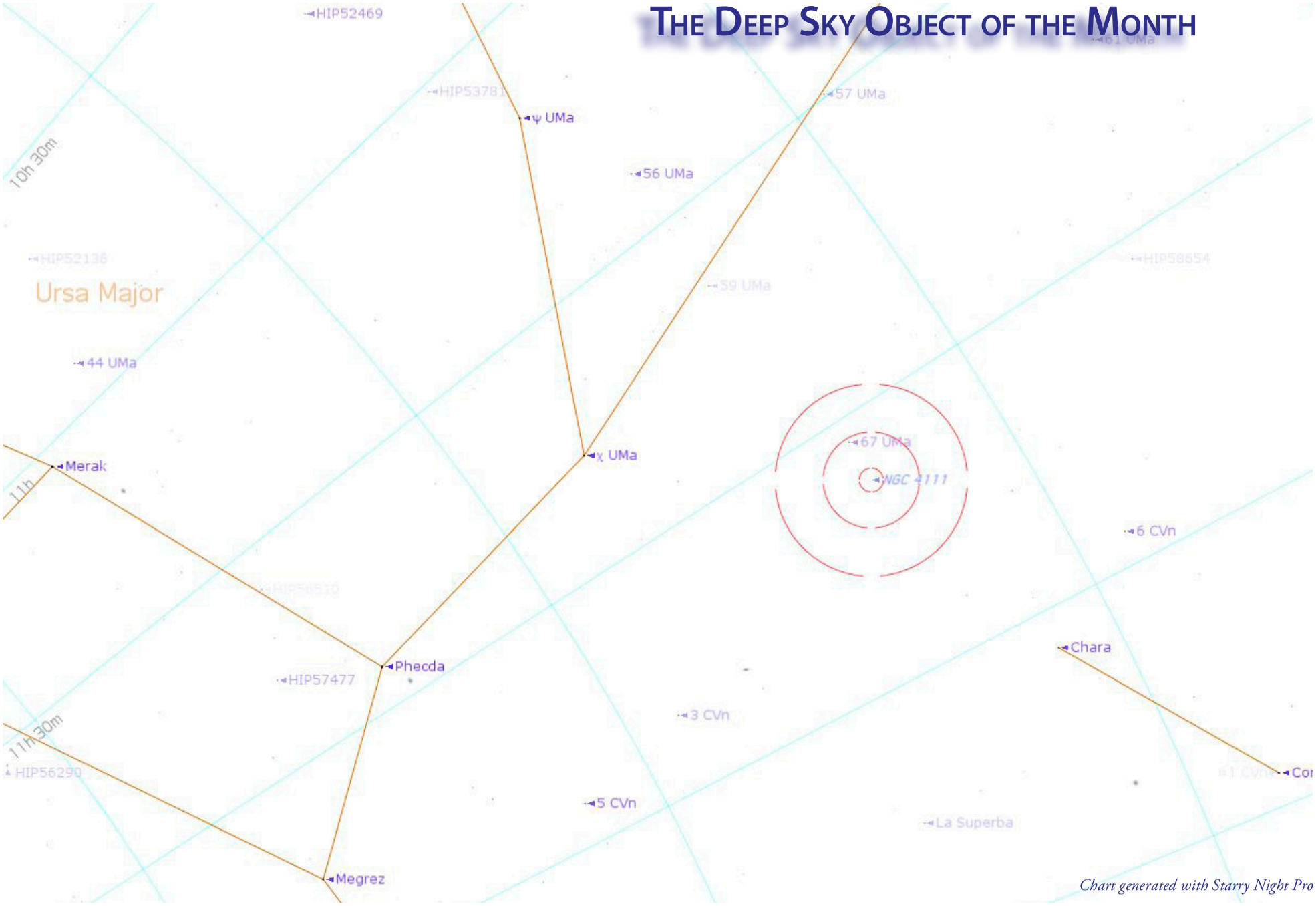
NASA re-tasked the spacecraft as Stardust-NExT to perform a bonus mission and fly past comet Tempel 1, which was struck by the Deep Impact mission in 2005. The mission collected images and other scientific data to compare with images of that comet collected by the Deep Impact mission in 2005. Stardust traveled approximately 13 million miles around the sun in the weeks after the successful Tempel 1 flyby. The Stardust-NExT mission met all mission goals, and the spacecraft was extremely successful during both missions. From launch until final rocket engine burn, Stardust travelled approximately 3.54 billion miles.

After the mileage logged in space, the Stardust team knew the end was near for the spacecraft. With its fuel tank empty and final radio transmission concluded, history's most traveled comet hunter will move from NASA's active mission roster to retired.

"This kind of feels like the end of one of those old western movies where you watch the hero ride his horse towards the distant setting sun -- and then the credits begin to roll," said Stardust-NExT project manager Tim Larson from NASA's Jet Propulsion Laboratory in Pasadena, Calif. "Only there's no setting sun in space."

Stardust and Stardust-NExT missions were managed by JPL for NASA's Science Mission Directorate in Washington. The missions were part of the Discovery Program managed at NASA's Marshall Space Flight Center in Huntsville, Ala. Joe Veverka of Cornell University was the Stardust-NExT principal investigator. Don Brownlee of the University of Washington in Seattle was the Stardust principal investigator. Lockheed Martin Space Systems built the spacecraft and managed day-to-day mission operations.

The Deep Sky Object of the Month



NGC 4111 (PGC 38440) Edge-On Lenticular Galaxy in Canes Venatici

RA: 12h 07m 03.2s Dec: +43° 03′ 55″ Magnitude: 11.70 B Size: 2.0′ x 6.0′



As one of the many benefits to becoming an East Valley Astronomy Club member, we have an 8 inch Dobsonian reflector with eyepieces available for monthly check-out to current EVAC members. Have any questions, or interested?

Call or see David Hatch, EVAC Properties Manager
C 480.433.4217



The Observer is the official publication of the East Valley Astronomy Club. It is published monthly and made available electronically as an Adobe PDF document the first week of the month. Printed copies are available at the monthly meeting. Mailed copies are available to members for a slight surcharge to offset printing and mailing expenses.

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