June 2007

The Observer

East Valley Astronomy Club

Volume 21 Issue 6

From the Desk of the President
by Claude Haynes 2007 EVAC President

I mentioned the Sidewalk Astronomy Night to a co-worker, and he brought his two sons age 6 and 9 to the observatory. They spent most of the evening there, and when I ask John about it on Monday he responded that it had the "desired effect". The boys were excited and had spent the weekend with an astronomy picture book. He was right, it was the "desired effect" to stimulate the imagination and foster discovery; something that we quietly do each weekend. Thanks to all our volunteers!

Steven Desch's presentation for the May meeting was great. His casual comment about kid's getting excited to hold a chondrite in their hands applies to us older folks as well. It is amazing to contemplate the dynamic nature of the universe. Our own Howard Israel is guest speaker in June. While Howard solicited opinions on doing the Messier Marathon with a GOTO or manual scope during the question and answer session at the May meeting, his talk is on something more fundamental. I am amazed by Mayan astronomers ability to use simple observation and deductive reasoning to decipher the mysteries of the heavens. Perhaps we should take a cue from them and just look up (without our GOTO or manual scope) and just observe.

Wishing you clear skies – Claude.

The Backyard Astronomer
This and That *by Bill Dellinges*

This month I'd like to do something a little different. Allow me to pontificate on a hodgepodge assortment of astronomical matters of no great import. Nevertheless, I feel I must rid my mind of this clutter or risk my brain exploding. OK, let's see. This has been bugging me for some time. The Pleiades (The Seven Sisters) are not what they seem folks. Of the seven stars you see with the naked eye, two, Atlas (mag 3.64) and Pleione (5.09), are their parents. They're the two stars that make up the "handle" of the dipper-like asterism. The sisters are comprised of the four "bowl" stars (mag 2.87, 3.71, 3.88, and 4.18) and three other stars west of the "bowl." Of these three, only 4.31 magnitude Taygeta is usually seen. Thus, when you see seven sisters, you're actually seeing five sisters and their two parents.

Has it ever occurred to you everything we utilize in our daily activities has come from below the ground? Think about it. The metal in our cars, paper, glass, jewelry, clothes, wiring, wood, oil products, TV's, computers, nuclear weapons, on and on. Try to think of something that does not come from under the ground (Hmmm, maybe fish!?). And just think - all the components in your telescope were harvested from the Earth. We are a most ingenious species to mine (plunder?) the ground we stand on for our needs. And let us not forget

(Continued on page 2)

Inside this issue:

June Events:

- *Public Star Party in Gilbert - June 8*
- *Local Star Party at Boyce Thompson - June 9*
- *Grand Canyon Star Party - June 9 - 16*
- *January Meeting at Southeast Regional Library - June 15*
- *Deep Sky Star Party at Vekol Road - June 16*
- *ASU Polytechnic Star Party - June 19*
- *SRPMIC Library Star Party - June 21*

The Backyard Astronomer

(Continued from page 1)

that with the possible exception of hydrogen and helium, the atoms that comprise all those toys – and us – were forged in the hearts of stars that existed before the sun was created.

Speaking of telescopes, what a marvelous contraption, eh? They bring the distant universe to us. Or do they? I recall a most unsettling statement I once heard in this regard. That person boldly remarked that telescopes don't bring things closer. Light from distant objects travels to us (!). Hmmm, I guess he was right in a way. But still, without a telescope, even though the photons do come to us, some device is needed to gather or amplify them for analysis. And isn't it a wonderful thing that the light carries with it a message in the form of spectral lines - a stellar bar code if you will - that reveal the radiating object's composition, temperature, spin, magnetic properties, distance, motion, and more? Lucky for us our universe works that way or we'd have a devil of time figuring out its nature.

Spending thousands on an eclipse trip? Every day you can witness two spectacular astronomical events for free. Though we take it for granted, sunrise and sunset are amazing sights when you stop to think about it. After hours of darkness, your rotating home planet brings the glorious stellar nuclear furnace we orbit into view. Later that day it descends in the west, gradually sinking below the horizon beginning another eight hour eclipse. Ditto moonrise and moonset.

I used to hate the moon. For two weeks each month its moonlight interfered with my stargazing. I must be mellowing out. The moon is now my friend. Now I see Luna offers three positives to me. One - the moon provides the most surface detail of any heavenly body in the universe. Two - if you choose, you can partake in observing this detail rather than cursing our satellite for ruining a night of deep sky observing. The moon is a never ending source of discovery; every time I observe the moon, I see something I've never noticed before. Three – it's really cool to see another world sitting there in the sky, like a scene out of a science-fiction movie.

Would you like to see another Sun-like star (G2 V) in your telescope, just to say hello? Here are a couple of candidates in the current spring/summer sky. In eastern Hercules, out in the middle of nowhere is OΣ 358, a nice equal magnitude double star. Both components are G2 V stars! Mag. 6.8, 7.0, Sep. 1.3" (and closing-hurry!). It's plotted on page 190/1 of the Night Sky Observer's Guide. RA 18h 36m, DEC +16° 59'. SAO 103886.

Have you ever noticed 16 Cygni, that neat wide double star next to NGC 6826 (the Blinking Planetary in Cygnus) in your finder? The brighter magnitude 6.0 component is a G 2 V star. The mag 6.3 B component 39.5" away is a G5 V (well, pretty close to the Sun's spectral type). RA 19h 41.8m, DEC +50° 32'. SAO 31898.

Thought experiment: make the Sun and Moon disappear instantly. The Earth continues moving in a straight line. It's getting cold. But in the few days we have to live, we will be able to view the entire 360 degree night sky (all four seasons of constellations) during each 24 hour rotation of our planet. Is that neat or what? To prepare for this possibility, I suggest ordering the best cold weather jacket L.L. Bean has to offer.

A few rapid fire points to end with: Why is it, the more we learn about the universe, the more confounding questions it creates? And the weirder it gets. Who determined that clocks should run clockwise? Can you prove your life isn't a dream? A telescope has the uncanny power to attract clouds. There is no place on a telescope for plastic - period. If you can't make it with just metal and glass, don't bother making it at all (wood being a possible exception). Alarming trend I see lately: At restaurants I'm being given a senior discount without asking for one.

Last Quarter Moon on June 8 at 04:43

New Moon on June 14 at 20:14

First Quarter Moon on June 22 at 06:15

Full Moon on June 30 at 06:49

Was Einstein Wrong About Space Travel?

by Patrick L. Barry

Consider a pair of brothers, identical twins. One gets a job as an astronaut and rockets into deep space. The other stays on Earth. When the traveling twin returns home, he discovers he's younger than his brother.

This is Einstein's Twin Paradox, and although it sounds strange, it is absolutely true. The theory of relativity tells us that the faster you travel through space, the slower you travel through time. Rocketing to Alpha Centauri—warp 9, please—is a good way to stay young.

Or is it?

Some researchers are beginning to believe that space travel could have the opposite effect. It could make you prematurely old.

"The problem with Einstein's paradox is that it doesn't fold in biology—specifically, space radiation and the biology of aging," says Frank Cucinotta, NASA's chief scientist for radiation studies at the Johnson Space Center.

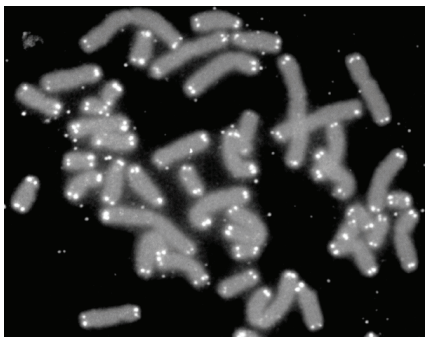
While the astronaut twin is hurtling through space, Cucinotta explains, his chromosomes are exposed to penetrating cosmic rays. This can damage his telomeres—little molecular "caps" on the ends of his DNA. Here on Earth, the loss of telomeres has been linked to aging.

So far, the risk hasn't been a major concern: The effect on shuttle and space station astronauts, if any, would be very small. These astronauts orbit inside of Earth's protective magnetic field, which deflects most cosmic rays.

But by 2018, NASA plans to send humans outside of that protective bubble to return to the moon and eventually travel to Mars. Astronauts on those missions could be exposed to cosmic rays for weeks or months at a time. Naturally, NASA is keen to find out whether or not the danger of "radiation aging" really exists, and if so, how to handle it.

Science is only now beginning to look at the question. "The reality is, we have very little information about [the link between] radiation and telomere loss," says Jerry Shay, a cell biologist at the University of Texas Southwestern Medical Center at Dallas. With support from NASA, Shay and others are studying the problem. What they learn about aging could benefit everyone, on Earth and in space.

Like the fuse of a time bomb, telomeres are long strands of repeating DNA that shorten each time a cell divides. When the telomeres become too short, the cell's time is up: It can no longer divide, a state of affairs known as "replicative senescence."

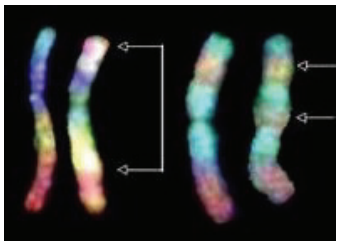


Telomeres (white) cap the ends of human chromosomes (gray). *Image credit: U.S. Department of Energy Human Genome Program.*

Without this built-in fuse, human cells would be able to continue growing and dividing indefinitely. In fact, scientists believe that cells evolved telomeres as a way of preventing the out-of-control cell growth of cancerous tumors. Because of telomeres, most human cells can only divide 50 to 100 times before the time bomb goes off.

One current theory of aging holds that, as the cells of a person's body start to hit this telomere-imposed limit, the lack of fresh, new cells causes the typical signs of aging: wrinkled skin, failing organs, weaker immune system, etc.

Whether or not telomere loss actually causes aging remains a matter of debate, Shay notes. The fact that shortened telomeres go hand in hand with aging is well documented. People with shorter telomeres, for example, are known to not live as long on average as people with longer telomeres. But mere correlation doesn't prove whether telomeres are in fact the cause.



Human chromosomes revealed by RxFISH. *Image credit: NASA/JSC.*

"It's hard to prove cause and effect in these things. But I think there's a sufficient number of these correlative studies from a variety of different investigators that one has to start believing that short telomeres are a marker of aging," Shay says.

Recent research, performed by Frank Cucinotta and colleagues, showed that iron-nuclei radiation (a chief component of cosmic rays) does indeed damage the telomeres of human

(Continued on page 13)

The Brightest Supernova Ever
by Dr. Tony Phillips

The brightest stellar explosion ever recorded may be a long-sought new type of supernova, according to observations by NASA's Chandra X-ray Observatory and ground-based optical telescopes. This discovery indicates that violent explosions of extremely massive stars were relatively common in the early universe, and that a similar explosion may be ready to go off in our own galaxy.

"This was a truly monstrous explosion, a hundred times more energetic than a typical supernova," said Nathan Smith of the University of California at Berkeley, who led a team of astronomers from California and the University of Texas in Austin. "That means the star that exploded might have been as massive as a star can get, about 150 times that of our sun. We've never seen that before."

Astronomers think many of the first stars in the Universe were this massive, and this new supernova may thus provide a rare glimpse of how those first generation stars died. It is unprecedented, however, to find such a massive star and witness its death. The discovery of the supernova, known as SN 2006gy, provides evidence that the death of such massive stars is fundamentally different from theoretical predictions.

"Of all exploding stars ever observed, this was the king," said Alex Filippenko, leader of the ground-based observations at the Lick Observatory at Mt. Hamilton, Calif., and the Keck Observatory in Mauna Kea, Hawaii. "We were astonished to see how bright it got, and how long it lasted."

The Chandra observation allowed the team to rule out the most likely alternative explanation for the supernova: that a white dwarf star with a mass only slightly higher than the sun exploded into a dense, hydrogen-rich environment. In that event, SN 2006gy should have been 1,000 times brighter in X-rays than what Chandra detected.

Optical (left) and X-ray (right) images of SN 2006gy. The dimmer source at lower-left is the nucleus of the host galaxy. The brighter source at upper-right is the stellar explosion. The supernova was as bright as the entire core of a galaxy!

"This provides strong evidence that SN 2006gy was, in fact, the death of an extremely massive star," said Dave Pooley of the University of California at Berkeley, who led the Chandra observations.

The star that produced SN 2006gy apparently expelled a large amount of mass prior to exploding. This large mass loss is similar to that seen from Eta Carinae, a massive star in our galaxy, raising suspicion that Eta Carinae may be poised to explode as a supernova. Although SN 2006gy is intrinsically the brightest supernova ever, it is in the galaxy NGC 1260, some 240 million light years away. However, Eta Carinae is only about 7,500 light years away in our own Milky Way galaxy.

"We don't know for sure if Eta Carinae will explode soon, but we had better keep a close eye on it just in case," said Mario Livio of the Space Telescope Science Institute in Baltimore, who was not involved in the research. "Eta Carinae's explosion could be the best star-show in the history of modern civilization."

Supernovas usually occur when massive stars exhaust their fuel and collapse under their own gravity. In the case of SN 2006gy, however, astronomers think that a very different effect may have triggered the explosion. Under some conditions, the core of a massive star produces so much gamma ray radiation that some of the energy from the radiation converts into particle and anti-particle pairs. The resulting drop in energy causes the star to collapse under its own huge gravity.

After this violent collapse, runaway thermonuclear reactions ensue and the star explodes, spewing the remains into space. The SN 2006gy data suggest that spectacular supernovas from the first stars that spew their remains - rather than completely collapsing to a black hole as theorized - may be more common than previously believed.

"In terms of the effect on the early universe, there's a huge difference between these two possibilities," said Smith. "One [sprinkles] the galaxy with large quantities of newly made elements and the other locks them up forever in a black hole."

Article courtesy of Science@NASA

eta Carinae--a supernova waiting to happen in our own galaxy?

June Guest Speaker : Howard Israel

The June speaker will be none other than our own Vice President, Howard Israel. Howard Israel has been involved in astronomy since his retirement in 1997. Since joining the East Valley Astronomy Club in 1998, he has held several offices including Board Member, Events Coordinator and twice as Vice President.

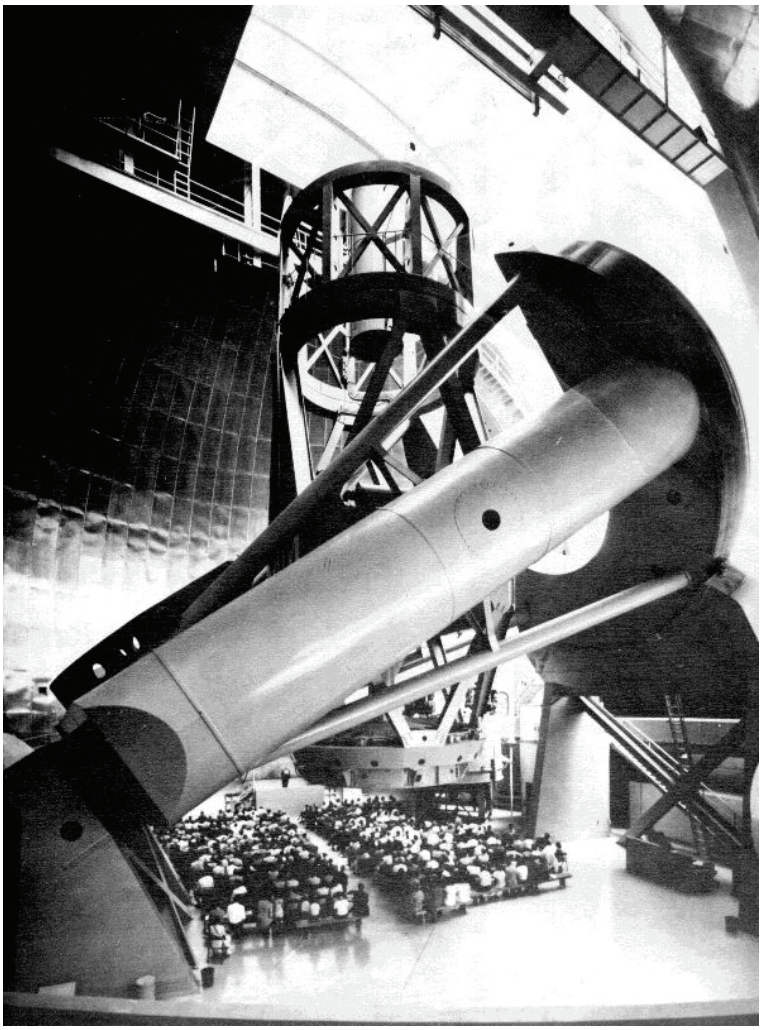
From 2002 through 2005 he worked as an astronomy lecturer and planetarium operator at the Arizona Science Center in Phoenix, AZ. This position involved giving astronomy lectures to the general public and school groups, as well as running planetarium and special astronomy shows in a 200 seat planetarium.

During the summer, as a volunteer at the Lowell Observatory, Flagstaff, AZ, he provides astronomy lectures and night sky telescope observing sessions to the general public and school groups.

He's currently an active cruise ship lecturer -- providing astronomy lectures to passengers sailing on most of the major cruise ship lines. In this position, he has traveled extensively throughout the world. He recently returned from a 19 day Princess Cruise to the Panama Canal, giving eight separate astronomy lectures. In late July, he leaves on an eight day lecture cruise to the eastern Caribbean on behalf of Royal Caribbean cruise lines.

One of the most common questions he is asked is how he became a cruise lecturer. His talk will cover the steps involved in pursuing this exciting career. Additionally, he will give a lecture that is very popular on western Caribbean cruises to the Yucatan Peninsula, Mayan Astronomy.

June Astronomical Milestone Remembered



The 200-inch Hale Telescope was the world's largest effective telescope for 45 years (1948 - 1993). It was dedicated on June 3, 1948 and formally named in honor of George Ellery Hale, who passed away in 1938. Almost one thousand people attend the dedication, including many dignitaries from around the world. The first demonstration of the telescope and dome includes a ride on the dome as it spins. The ride is smooth enough to confuse some into thinking the telescope floor is rotating.

The 200-inch mirror is transported from Pasadena to Palomar on November 12, 1947. The 40 ton cargo requires three diesel tractors to push it up the mountain. Despite a storm, which nearly aborts the transport, the 125 mile trip is completed in 32 hours.

Classified Ads

Your ad here...

...or here

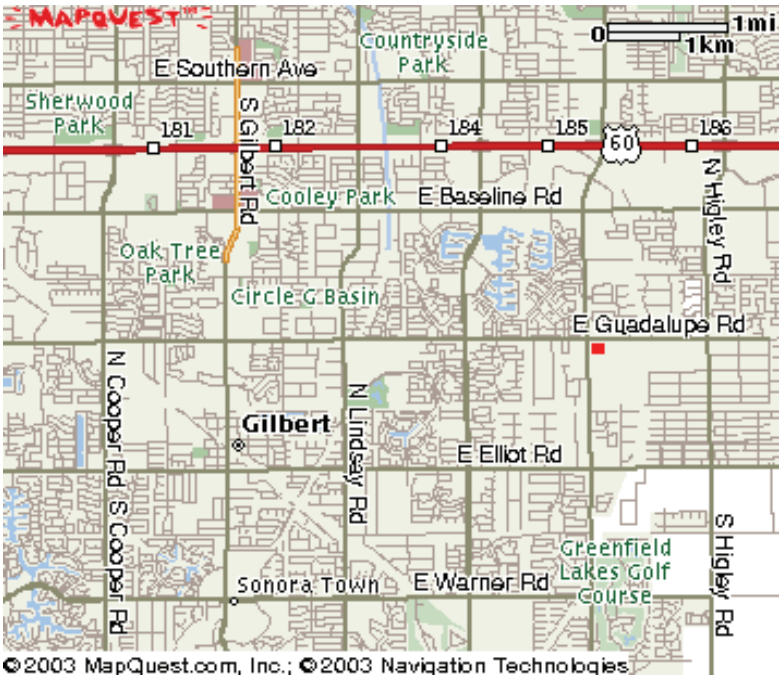
...or even here

www.eastvalleyastronomy.org/grco/obs.asp

Advertisements for astronomical equipment or services will be accepted from current EVAC members only. Ads will be published as space permits and may be edited. Ads should consist of a brief text description and must include a current member name and phone number. You may include your email address if you wish. Ads will be published until canceled (as space allows), so please inform the editor when your item has sold.

Ads should be emailed to: news@eastvalleyastronomy.org

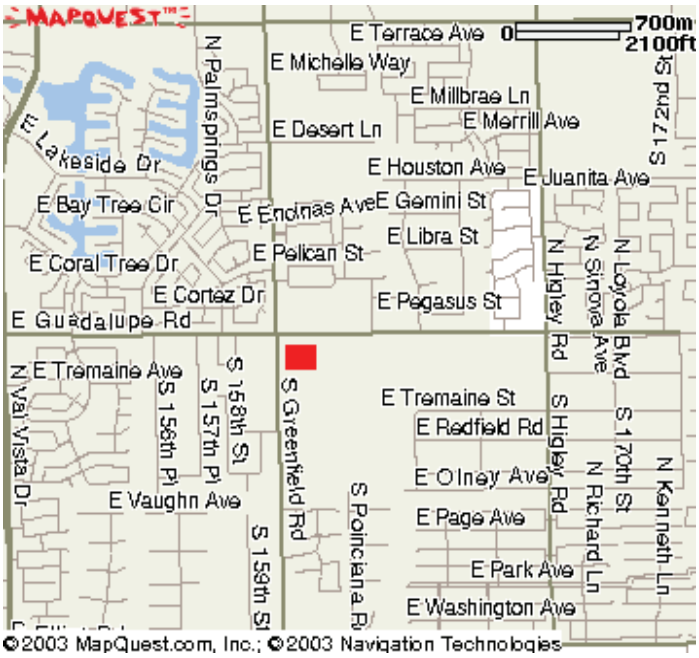
Support your local telescope dealer!



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 Rd., on the southeast corner of Greenfield and Guadalupe Roads. Meetings begin at 7:30pm.

Visitors are always welcome!

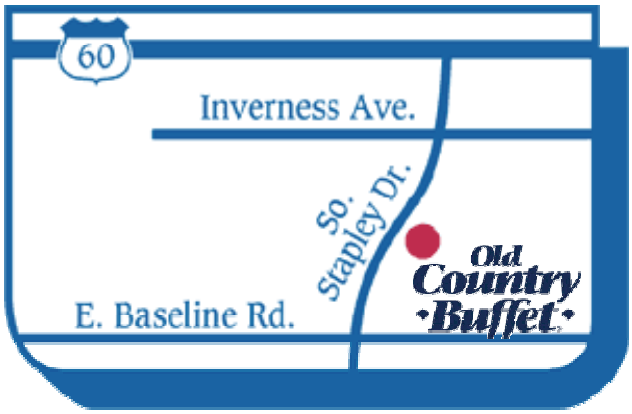


2007 Meeting Dates

June 15
July 20
August 17
September 21
October 19
November 16
December 21

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, (near the Walmart Supercenter) just south of US 60.



Old Country Buffet 1855 S. Stapley Drive in Mesa

Likewise, all are invited to join us after the meeting for coffee and more astro talk at the Village Inn Restaurant located on the northeast corner of Southern and Gilbert in Mesa.

Village Inn 2034 E. Southern Ave in Mesa

June 2007

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					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

Schedule of Events

- *June 8 - Public Star Party at Riparian Preserve in Gilbert*
- *June 9 - Local Star Party at Boyce Thompson Arboretum State Park*
- *June 9 - 16 - Grand Canyon Star Party*
- *June 15 - General Meeting at Southeast Regional Library in Gilbert*
- *June 16 - Deep Sky Star Party at Vekol Road*
- *June 19 - ASU Polytechnic Star Party*
- *June 21 - SRPMIC Library Star Party*

Minutes of May EVAC Meeting

Wayne Thomas, Secretary

May 18, 2007

President Claude Haynes called the meeting to order at 7:30 pm and introduced the officers and directors. Four guests also introduced themselves. A touring couple from abroad asked if anyone would like to join them on a tour of the Large Binocular Telescope on Mt. Graham on May 26.

Treasurer Bill Houston gave the Treasurer's report – Income for April of $234.25 and Expenses for the same period of $1176.77 for a balance of $8,352.58. April brought in 2 new members and 4 renewals for a total membership of 169 at the end of April.

Observatory manager Martin Thompson gave his report on scheduling two persons per night when open. Attendance has been good.

Peter Argenziano announced an award for the Galaxies observing program to Howard Israel and awarded the Hershel 400 observation certificate to Frank Pino.

Randy Peterson reviewed the schedule of events for the coming month with special emphasis on International Sidewalk Astronomy night. An additional 8 events were also announced.

Tom and Jennifer Polakis spoke about the proposed Robert Burnham memorial to be erected at Lowell Observatory. They suggested that EVAC has an opportunity to participate by allowing funds collected for the project to flow through the EVAC treasury. This would allow donors to the Burnham project to have tax deductions due to EVAC's IRS 501(c)(3) status.

During Q&A, several persons responded to a question about exit pupil size in relation to a person's actual dark adapted pupil size.

After break we were treated to a somewhat technical presentation by speaker Dr. Steve Desch. He discussed some aspects of the formation of the Solar System and some of the processes involved.

The meeting adjourned about 9:45 pm.

East Valley Astronomy Club -- 2007 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

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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.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 my family and I 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

The Ions of Dawn
by Patrick L. Barry

This summer, NASA will launch a probe bound for two unexplored worlds in our solar system's asteroid belt—giant asteroids Ceres and Vesta. The probe, called Dawn, will orbit first one body and then the other in a never-before-attempted maneuver.

It has never been attempted, in part, because this mission would be virtually impossible with conventional propulsion. "Even if we were just going to go to Vesta, we would need one of the largest rockets that the U.S. has to carry all that propellant," says Marc Rayman, Project System Engineer for Dawn at JPL. Traveling to both worlds in one mission would require an even bigger rocket.

This is a trip that calls for the unconventional. "We're using ion propulsion," says Rayman.

The ion engines for the Dawn spacecraft proved themselves aboard an earlier, experimental mission known as Deep Space 1 (DS1). Because ion propulsion is a relatively new technology that's very different from conventional rockets, it was a perfect candidate for DS1, a part of NASA's New Millennium Program, which flight-tests new technologies so that missions such as Dawn can use those technologies reliably.

"The fact that those same engines are now making the Dawn mission possible shows that New Millennium accomplished what it set out to," Rayman says.

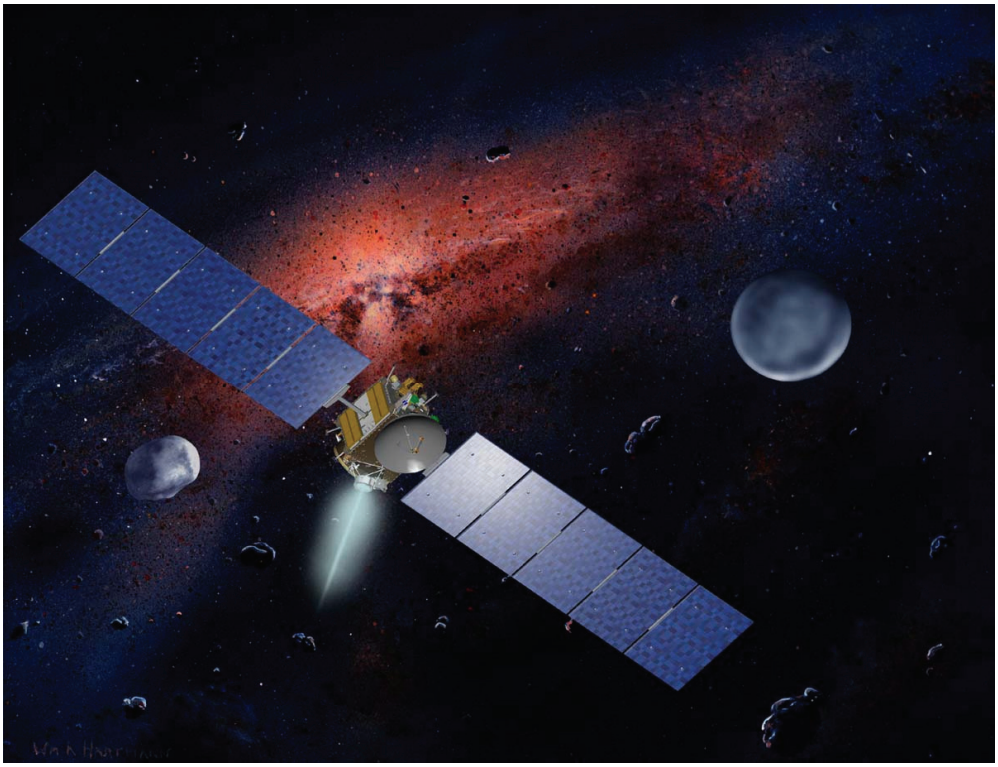
Ion engines work on a principle different from conventional rockets. A normal rocket engine burns a chemical fuel to produce thrust. An ion engine doesn't burn anything; a strong electric field in the engine propels charged atoms such as xenon to very high speed. The thrust produced is tiny—roughly equivalent to the weight of a piece of paper—but over time, it can generate as much speed as a conventional rocket while using only about 1/10 as much propellant.

And Dawn will need lots of propulsion. It must first climb into Vesta's orbit, which is tilted about 7 degrees from the plane of the solar system. After studying Vesta, it will have to escape its gravity and maneuver to insert itself in an orbit around Ceres—the first spacecraft to orbit two distant bodies. Dawn's up-close views of these worlds will help scientists understand the early solar system.

"They're remnants from the time the planets were being formed," Rayman says. "They have preserved a record of the conditions at the dawn of the solar system."

Find out about other New Millennium Program validated technologies and how they are being used in science missions at http://nmp/TECHNOLOGY/infusion.html . While you're there, you can also download "Professor Starr's Dream Trip," a storybook for grown-ups about how ion propulsion enabled a scientist's dream of visiting the asteroids come true. A simpler children's version is available at http://spaceplace.nasa.gov/en/kids/nmp/starr.

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



Artist's rendering of Dawn spacecraft, with asteroids. Largest are Vesta and Ceres. Credits: Dawn spacecraft—Orbital Sciences Corporation; background art—William K. Hartmann, courtesy UCLA.

If it's Clear...

by Fulton Wright, Jr.
Prescott Astronomy Club

June 2007

Shamelessly stolen information from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find info. When gauging distances, remember that the Moon is $^1/_2$° or 30 arc minutes in diameter. All times are MST unless otherwise noted.

On Wednesday, May 30, 4 Vesta will be at opposition and unusually bright. The Moon will interfere with seeing the magnitude 5.4 asteroid with your unaided eye, so try a week earlier or later when the sky is dark. See Astronomy magazine, May 2007, p. 51; June 2007, p. 51.; or Sky & Telescope magazine, June 07, p. 57 for a finder chart.

On Thursday, May 31, at 7:51 PM the full moon rises spoiling any chance of seeing faint fuzzies for the whole night. This second full moon of the month is called a blue moon.

On Friday, June 1, about 8:30 PM, you can see Venus, Pollux, and Castor lined up horizontally about 30° above the west horizon. Venus, of course, is the bright one on the left. Also catch Mercury at its greatest elongation from the sun, below Castor, about 10° above the horizon.

On Monday, June 4, you can see some interesting events with Jupiter's moons. Starting at 9:51 PM Europa moves in front of Jupiter. 3 minutes later, Europa's shadow falls on the planet, just below the satellite. As they start to march across the planet, the great red spot nears the meridian in the southern hemisphere. At 12:25 AM the satellite and shadow leave. As they are leaving, Callisto passes south of the planet, going the opposite direction. Jupiter has to be at opposition for the satellite and shadow to appear so close together.

On Saturday, June 9, in the early AM, you can see some events with Jupiter's moons. Here is the schedule:

12:34 AM Ganymede moves in front of Jupiter

12:48 AM Ganymede's shadow falls on Jupiter (The great red spot tracks along south of the shadow)

2:12 AM Io moves in front of Jupiter

2:16 AM Io's shadow falls on Jupiter (2 shadows)

2:37 AM Ganymede moves from in front of Jupiter

3:03 AM Ganymede's shadow leaves Jupiter (1 shadow now)

On Wednesday, June 13, there are some interesting events with Saturn's moons. These will be MUCH harder to observe than Jupiter's moons events. Start with a big (12 inch) telescope, steady skies, and your fingers crossed. There is a diagram in Astronomy magazine, June 2007, p. 49. Here is the schedule of events:

7:00 PM Iapitus moves in front of Saturn near the north pole 8:15 PM Dark enough to find Saturn

8:47 PM Enceladus enters Saturn's shadow near the south pole

10:20 PM Enceladus leaves Saturn's shadow

10:25 PM Iapitus moves from in front of Saturn

11:23 PM Saturn sets

On Thursday, June 14, it is new moon, so you can hunt for faint fuzzies all night.

On Saturday, June 16, about 8:15 PM, you can see the crater Humboldt on the Moon at its best. This crater is very near the southeast (bottom right) limb and very difficult to see, even when a favorable libration, like tonight, tips that part of the Moon toward us. Sunday night will be a good time to see the crater Petavius. See Astronomy magazine, June 2007, p. 49 for more information.

On Monday, June 18, about 8:30 PM. you can see the crescent moon between Venus and Saturn. With your unaided eye look 30° above the west horizon for the trio.

On Tuesday, June 19, at 5:00 PM, you can see the Moon occult a star in broad daylight. With a medium (6 inch) telescope, look 65 ° above the south horizon for the crescent Moon. Imagine a clock face on the Moon with 12 o'clock at the northern cusp, 3 o'clock at the thickest part of the crescent, 6 o'clock at the southern cusp, and 9 o'clock in the middle of the dark (invisible) limb to the east. The star, Regulus, will disappear at the 8 o'clock position (at 5:00 PM MST). Here are 2 hints to help you find the star. 1) The Moon moves through the stars a distance of its own diameter in about 1 hour. That means that if you look for the star half an hour before the event, the star should be approximately half a moon diameter in front of the invisible limb that will occult it. 2) If you use high power in your telescope, the sky will appear darker, but the star won't, so the star should be easier to see. The star will reappear at the 2 o'clock position (on the bright limb) at 6:23 PM MST. The times and positions will be slightly different in other parts of Arizona. If your telescope uses a star diagonal, look out for "left-handed" clocks because of the mirror image reversal.

On Friday, June 29, at 7:37 PM (10 minutes before sunset) the full moon rises spoiling any chance of seeing faint fuzzies for the whole night.

On Saturday, June 30, about 8:30 PM, you can see Venus and Saturn 0.7° apart. With a small (3 inch) telescope look 20° above the west horizon for bright (mag -4.4), crescent Venus below, and dim (mag 0.6), ringed Saturn above. Low magnification will show them both in the same field. You may want to crank up the power to see their shapes.

Was Einstein Wrong About Space Travel?

(Continued from page 3)

cells.

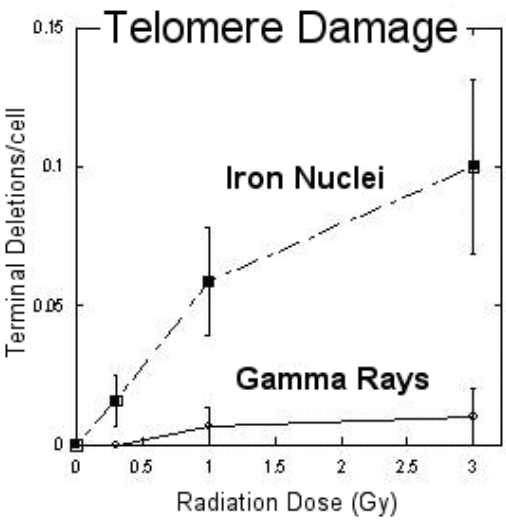
To prove this, they exposed laboratory dishes containing a kind of human blood cell called lymphocytes to beams of both iron nuclei and gamma rays. Until recently, such a thorough analysis of telomere damage would have been prohibitively time consuming. But a new cell-staining technique called RxFISH (Rainbow cross-species Fluorescence In Situ Hybridization) allowed Cucinotta and his colleagues to look at many telomeres simultaneously.

"We had this surprising result that iron particles are much more damaging to telomeres than gamma rays," Cucinotta says. He suggests that this difference might be due to the wider path of damage caused by iron nuclei. Telomere strands wrap into elongated loops, like little knots on the ends of chromosomes. Gamma rays can only strike one side of these loops or the other, but iron nuclei can affect both sides at the same time, inflicting lasting damage on the telomere—possibly causing its complete deletion. This explanation is still speculative, however.

The task now is to quantify the risk telomere damage might pose to astronauts, so that mission managers and the astronauts themselves can make informed decisions about the risks they face. In all likelihood, the effects will be modest, Shay says.

"We're talking about subtle things. These people are probably not going to wind up in wheelchairs or something like that from being in space," Shay says.

For example, astronauts who have



Iron nuclei are especially damaging to telomeres.

had the greatest exposure to space radiation, such as the Apollo astronauts who traveled to the Moon, tend to get cataracts about 7 years earlier than other astronauts, on average. Cataracts are a common symptom of aging.

Of greater concern is possible aging of the brain and spinal cord. Experiments with rats have shown that brain tissue is vulnerable to "aging" by iron-nuclei radiation--this according to research by Jim Joseph of Tufts University and Bernie Rabin at the University of Maryland.

"It is looking more and more likely that this could be a problem for long-term space travel," Cucinotta says.

However, if scientists can tease apart the exact ways that iron-particle radiation affects telomeres, they may be able find a way to avoid or correct it. The solution could be as simple as a pill containing DNA-repair molecules. "There are many ways that we can intervene," Shay says.

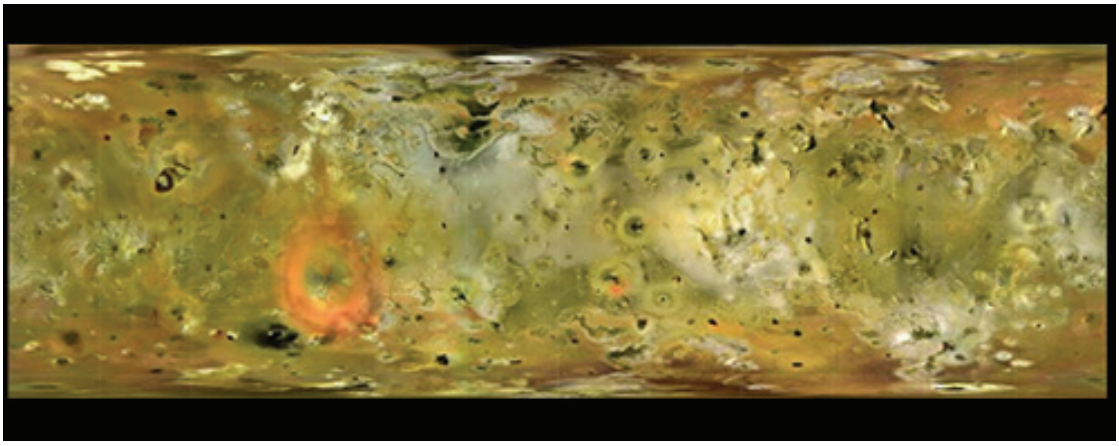
One way or another, NASA plans to keep their astronauts feeling young.

Editor's note: This story should not be construed to mean that Einstein's theory of Special Relativity is wrong. It is correct. The Twin Paradox was concocted in Einstein's day to illustrate time dilation only. It was never intended to treat all aspects of space travel. The newly discovered effect of space radiation on telomeres is the "paradox on the paradox," says Frank Cucinotta.

Article courtesy of Science@NASA

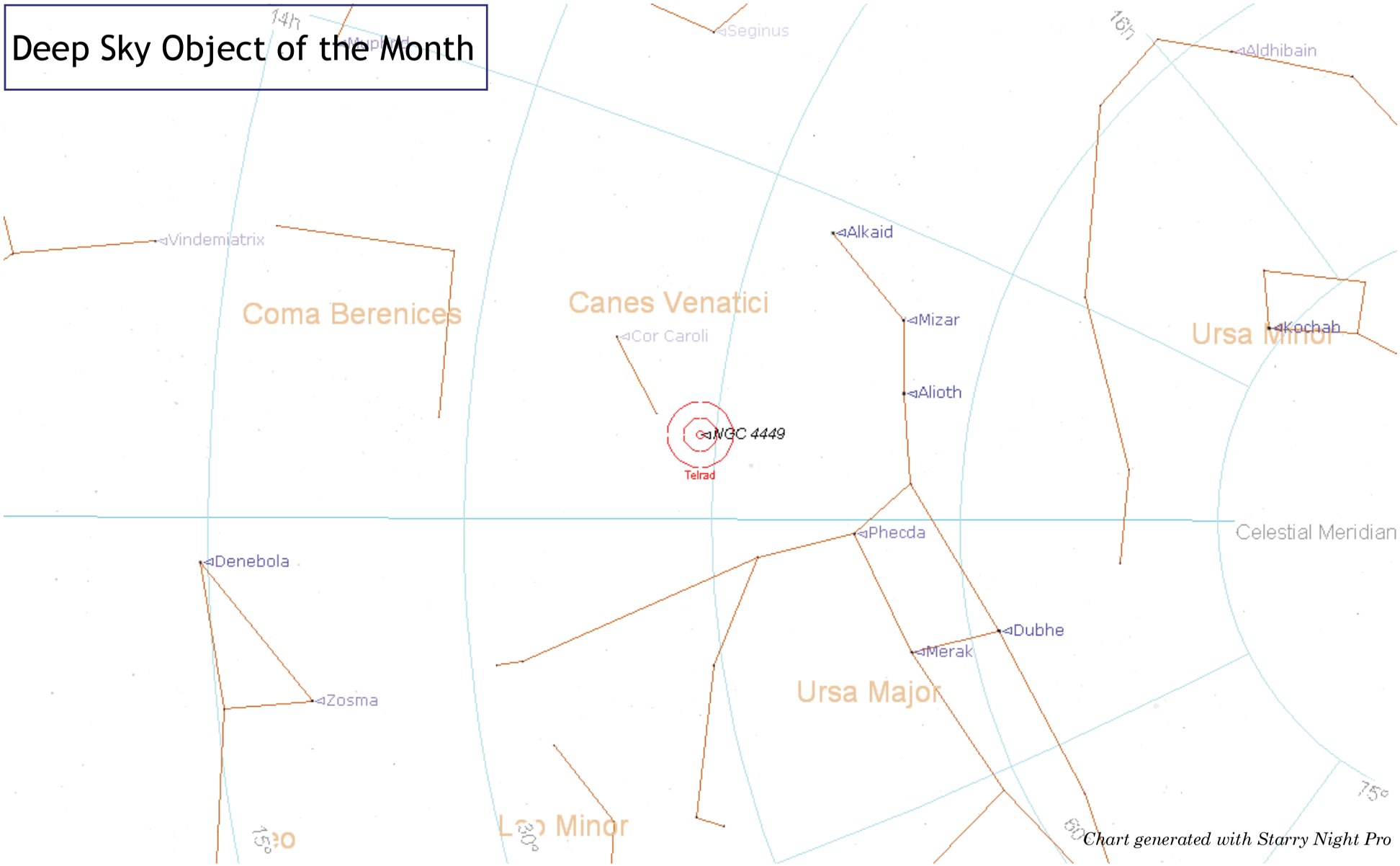
Io, the innermost of the Galilean moons, is the most volcanically active body in the Solar System.

This mosaic is in an equal area cylindrical map projection, centered on longitude 180. Full scale versions of this mosaic, and the data products used to generate it, can be obtained from the USGS Astrogeology website - http://astrogeology.usgs.gov/Projects/JupiterSatellites/



Mosaic credit: Tammy Becker and Paul Geissler, USGS

Deep Sky Object of the Month

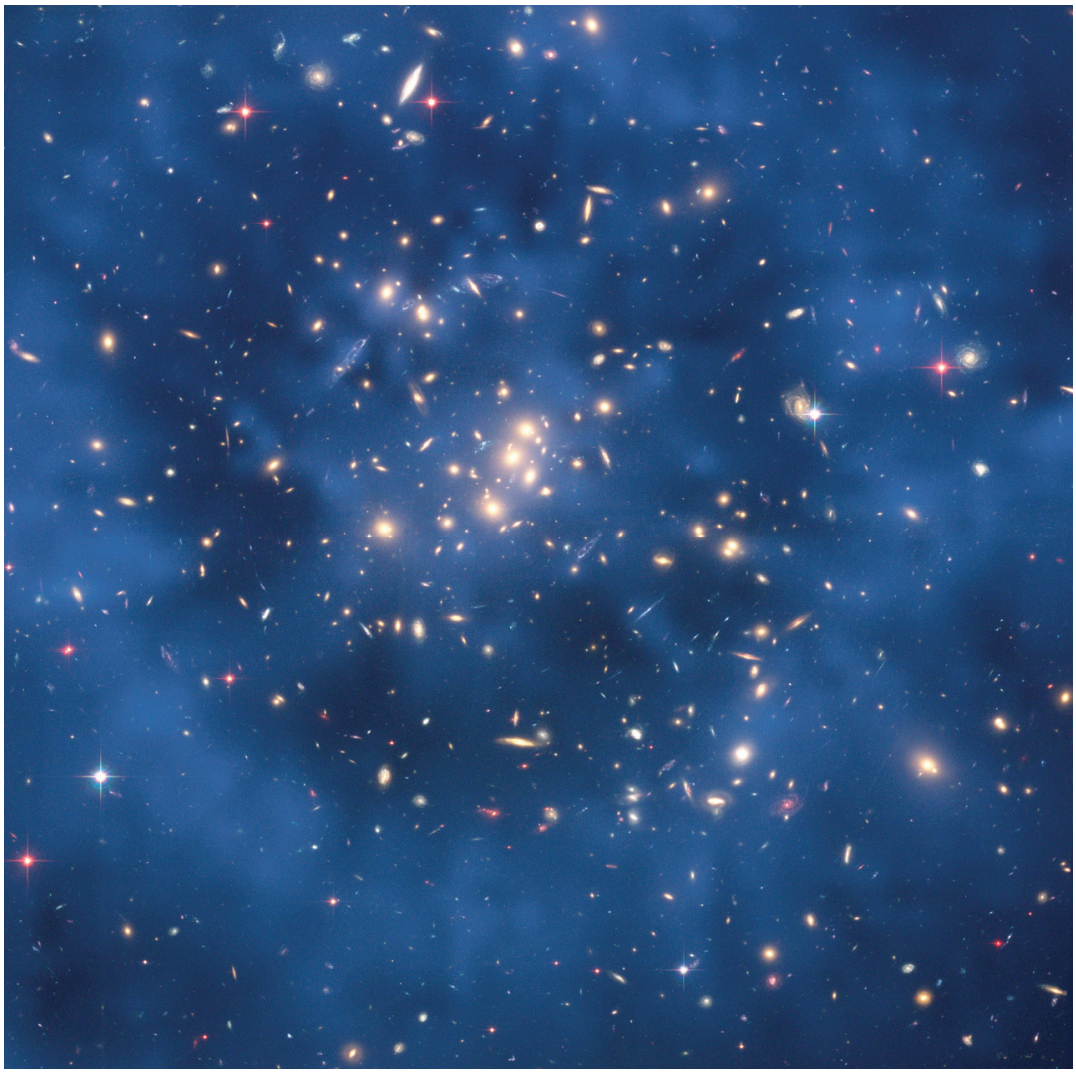


NGC 4449 Irregular Galaxy in Canes Venatici

RA 12h 28m 11.4s Dec +44° 05’ 40” Magnitude: 10.0 Size: 6.1’ x 4.3’

Surface Brightness: 11.5 PA: 61°

Hubble Finds Dark Matter Ring in Galaxy Cluster



Astronomers using NASA's Hubble Space Telescope have discovered a ghostly ring of dark matter that formed long ago during a titanic collision between two massive galaxy clusters.

The ring's discovery is among the strongest evidence yet that dark matter exists. Astronomers have long suspected the existence of the invisible substance as the source of additional gravity that holds together galaxy clusters. Such clusters would fly apart if they relied only on the gravity from their visible stars. Although astronomers don't know what dark matter is made of, they hypothesize that it is a type of elementary particle that pervades the universe.

The researchers spotted the ring unexpectedly while they were mapping the distribution of dark matter within the galaxy cluster Cl 0024+17 (ZwCl 0024+1652), located 5 billion light-years from Earth. The ring measures 2.6 million light-years across. Although astronomers cannot see dark matter, they can infer its existence in galaxy clusters by observing how its gravity bends the light of more distant background galaxies.

Coming in July… our guest speaker will be Steve Coe

Star Party Disclaimer

The East Valley Astronomy Club (EVAC) is not responsible for the property or liability of any star party participant, nor will the club be held liable for their actions or possessions. EVAC is not responsible for any vehicular damage, theft, or mechanical difficulties that may occur while attending a star party. EVAC strongly recommends adherence to the doctrine of 'safety in numbers' when it comes to remote observing sites. In the interest of safety it is recommended that you don't go to remote sites alone and that someone knows where you have gone each time you go out observing.

The Observer is published monthly by the East Valley Astronomy Club and made available electronically (PDF) the first week of the month. Printed copies are available at the monthly meeting.

Please send your contributions, tips, suggestions and comments to the Editor at: news@eastvalleyastronomy.org

Contributions may be edited.

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Keep Looking Up!

East Valley Astronomy Club

PO Box 2202

Mesa, AZ 85214-2202