



THE OBSERVER

East Valley Astronomy Club



UPCOMING EVENTS:

- Local Star Party - March 2*
- Public Star Party - March 8*
- Deep Sky Observing Night - March 9*
- All-Arizona Messier Marathon - March 16*
- No General Meeting in March*

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

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The Backyard Astronomer Serendipity in Death Valley by Bill Dellinges

My wife and I decided to spend our 30th wedding anniversary in Death Valley National Park in California. Kind of sounds like a Woody Allen joke, eh? But no, it had been a long time since we were last there and thought a return visit was in order.

It's a 550 mile drive from the Phoenix area to Death Valley and the recent cold snap followed us all the way. The mountain range on the west side of Death Valley was snowcapped.

Its highest point, Telescope Peak, is 11,000 feet in elevation, a long ways from the park's lowest point, Badwater, minus 282 feet. The Park's east range rises to about 5,000 feet where a spectacular view can be had of the entire Valley from Dante's View.

The day we were there, a 30 mile an hour icy wind created conditions not unlike that found on Mount Everest. I don't think I've ever been that cold before.

Is there going to be any astronomy
Continued on page 4

The Backyard Astronomer

Continued from page 1 in this article? Yes! I brought my Televue 85mm refractor along in hopes of getting in a little observing and also looked forward to seeing how dark the night sky is at this remote location. I had heard good things over the years about how dark it is there.

Serendipity! I spied a sign announcing that the Las Vegas Astronomical Society would be giving a two night public star party and one day solar observation event. The star party was to be held at the airport. So that first night I drove 28 miles from Furnace Creek Ranch (where we stayed) to the Stovepipe Wells airport in the north Valley. But a storm was forming up, so we drove back to our lodgings. The next day I joined the Vegas club at their solar observation session in Furnace Creek with my TV85 and white light filter. They were a nice friendly group of guys. They had set up a 5" Explore Scientific refractor (white light) and two hydrogen alpha



The author at Badwater



The author's wife lora at Dante's View overlooking Death Valley

scopes - a 60mm Lunt and 80mm Celestron refractor with a Coronado HA filter. When I asked how one should approach the second night's star party without blinding people with headlights, one guy said to park near the hangar and tower. I had not seen a hangar and tower at Stovepipe and told him that. He said the airport was one mile away and had a hangar and tower. I had gone to the wrong airport the previous night. Who would guess Death Valley has two airports! Sure enough, consulting a map, there were two airport symbols on it.

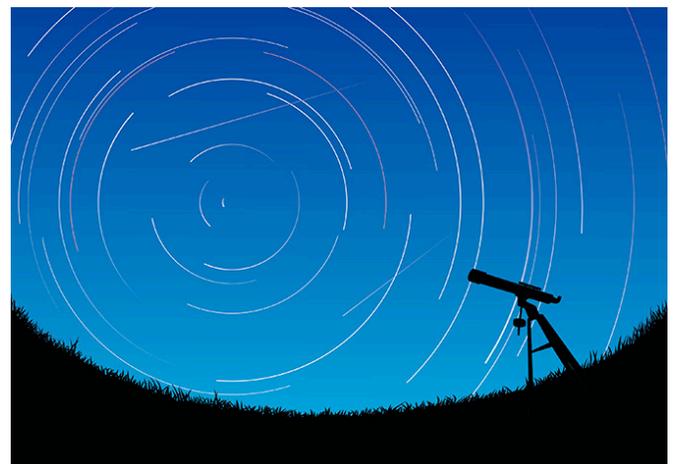
Rather than risking freezing to death observing at Dante's View, I decided to just hang out at the Vegas club's star party and look through their telescopes. It was clear that night and they had set up 20 telescopes. I got a look at M42 in a 25" and M1 in a 12". There were plenty of SCT's and refractors there too. My memory is foggy about what I saw in the various scopes, but basically I had a good time playing in the telescope field that night. I would assess the sky as better than Picket Post (even without the Phoenix light dome) but not as good as the Grand Canyon. The winter Milky Way was

prominent in the northeast and zenith but not that bright through the Monceros – Puppis region (I once saw this latter region from McDonald Observatory and found it annoyingly bright!).

I could easily make out all the stars in Ursa Minor, M31, the Double Cluster in Perseus, and M44, the Beehive Cluster in Cancer. The thing that really surprised me was how bright and noticeable the Zodiacal Light was. It had been a long time since I was at a site dark enough for it to show up. The spear-like shaft of light is reflected sunlight from dust particles in space along the ecliptic and best seen in dark skies after sunset in the early part of the year when the ecliptic is steep relative to the horizon (or in the fall before sunrise, for the same reason).

There are many interesting geological sights to behold in Death Valley. It's quite a remarkable place, its terrain unlike anything I've seen before. Kind of like being on the moon or an asteroid, but with air.

By the way, their current newsletter points out that Death Valley now holds the record for the hottest place on the planet, 134° F. on July 10th, 1913. The previous record of 136° F. recorded on September 13th, 1922 in Libya has been disqualified by the World Meteorological Organization.



What Exploded Over Russia?

by Dr. Tony Phillips

When the sun rose over Russia's Ural Mountains on Friday, Feb. 15th, many residents of nearby Chelyabinsk already knew that a space rock was coming. Later that day, an asteroid named 2012 DA14 would pass by Earth only 17,200 miles above Indonesia. There was no danger of a collision, NASA assured the public.

Maybe that's why, when the morning sky lit up with a second sun and a shock wave shattered windows in hundreds of buildings around Chelyabinsk, only a few people picking themselves off the ground figured it out right away. This was not a crashing plane or a rocket attack.

"It was a meteor strike--the most powerful since the Tunguska event of 1908," says Bill Cooke of NASA's Meteoroid Environment Office.

In a coincidence that still has NASA experts shaking their heads, a small asteroid completely unrelated to 2012 DA14 struck Earth only hours before the publicized event. The impactor flew out of the blue, literally from the direction of the sun where no telescope could see it, and took everyone by surprise.

"These are rare events and it is incredible to see them happening on the same day," says Paul Chodas of NASA's near-Earth Object Program at JPL.

Researchers have since pieced together what happened. The most telling information came from a network of infrasound sensors operated by the Comprehensive Test Ban Treaty Organization (CTBTO). Their purpose is to monitor nuclear explosions.

Infrasound is a type of very low-frequency sound wave that only elephants and a few other animals can hear. It turns out that meteors entering Earth's atmosphere cause ripples of infrasound to spread through the air of our planet. By analyzing infrasound records, it is possible to learn how long a meteor was in the air, which direction it traveled, and how much energy it unleashed.

The Russian meteor's infrasound signal was the strongest ever detected by the CTBTO network. The furthest station to record the sub-audible sound was 15,000km away in

Antarctica.

Listen to the infrasound recording, sped up 135x into the range of human hearing. Play it Western Ontario Professor of Physics Peter Brown analyzed the data: "The asteroid was about 17 meters in diameter and weighed approximately 10,000 metric tons," he reports. "It struck Earth's atmosphere at 40,000 mph and broke apart about 12 to 15 miles above Earth's surface. The energy of the resulting explosion exceeded 470 kilotons of TNT." For comparison,

the first atomic bombs produced only 15 to 20 kilotons.

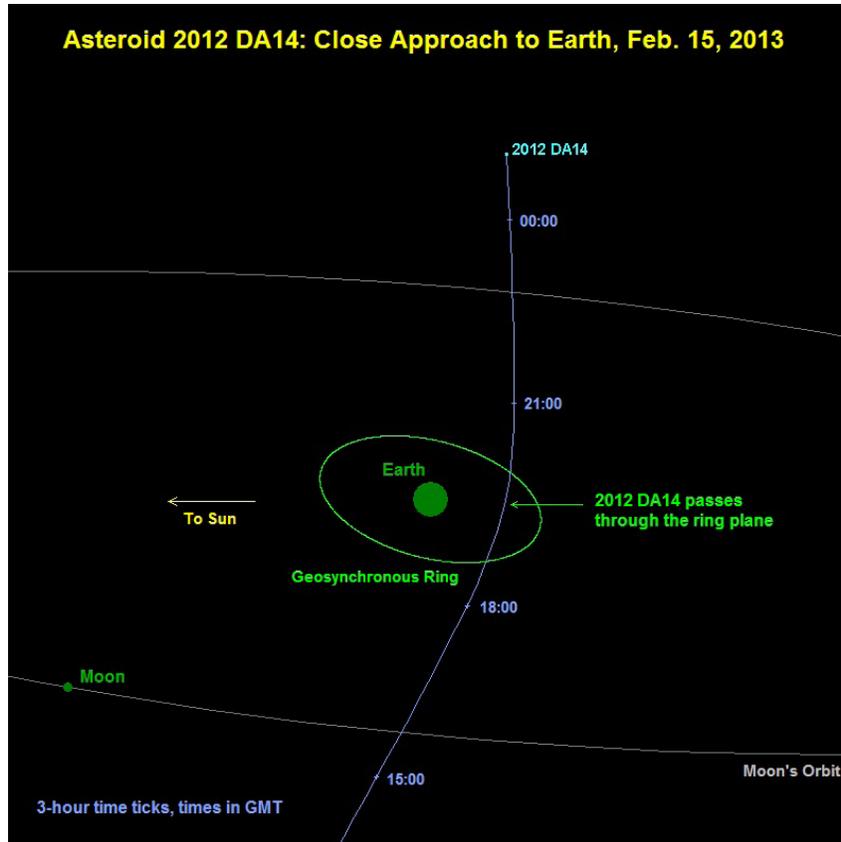
Based on the trajectory of the fireball, analysts have also plotted its orbit. "It came from the asteroid belt, about 2.5 times farther from the sun than Earth," says Cooke. Comparing the orbit of the Russian meteor to that of 2012 DA14, Cooke has shown that there is no connection between the two. "These are independent objects," he says. "The fact that they reached Earth on the same day, one just a little closer than the other, appears to be a complete coincidence."

Infrasound records confirm that the me-

eteor entered the atmosphere at a shallow angle of about 20 degrees and lasted more than 30 seconds before it exploded. The loud report, which was heard and felt for hundreds of miles, marked the beginning of a scientific scavenger hunt. Thousands of fragments of the meteor are now scattered across the Ural countryside, and a small fraction have already been found.

Preliminary reports, mainly communicated through the media, suggest that the asteroid was made mostly of stone with a bit of iron--"in other words, a typical asteroid from beyond the orbit of Mars," says Cooke. "There are millions more just like it."

And that is something to think about as the cleanup in Chelyabinsk continues.



Article courtesy of Science@NASA



The second SpaceX mission to the International Space Station under NASA's Commercial Resupply Services contract is scheduled to launch Friday, March 1, from Space Launch Complex 40 at Cape Canaveral Air Force Station in Florida. NASA Television coverage begins at 8:30 a.m. EST.

The company's Falcon 9 rocket carrying its Dragon cargo capsule will lift off at 10:10 a.m. If needed, a backup launch opportunity is available on March 2 with launch time at 9:47 a.m. and NASA TV coverage beginning at 8 a.m.

The mission is the second of 12 SpaceX flights contracted by NASA to resupply the space station. It will mark the third trip by a Dragon capsule to the orbiting laboratory, following a demonstration flight in May 2012 and the first resupply mission in October 2012.

The capsule will be filled with more than 1,200 pounds of scientific experiments and cargo. It will remain attached to the space station's Harmony module for more than three weeks. The Dragon capsule will splash down in the Pacific Ocean off the coast of Baja California on March 25, returning more than 2,300 pounds of experiment samples and equipment, which will be recovered for examination by scientists and engineers.

In advance of the launch, NASA will host a briefing on NASA's human deep space exploration progress at 2 p.m., Wednesday, Feb. 27, at the agency's Kennedy Space Center in Florida. On Thursday, Feb. 28, NASA will host a mission science briefing at 1 p.m. and a prelaunch news conference at 3 p.m. All three briefings will be carried live on NASA TV and the agency's website.

2013 All-Arizona Messier Marathon

Saturday, March 16

The marathon this year is at the same site as the event last year: Salome Emergency Airfield (south of I-10 at Exit #53).

The pre-event meeting will begin promptly at 18:15 on Saturday at the junction of the two runways.

Everyone is invited out to the site on Friday night for some observing, but reminder the Friday date is not the marathon. It has been set aside for more time to observe from your personal observing list. It will also provide more time for socializing on Saturday.

Registration in advance is not required. The event is free and open to all, but we will need either your or your clubs support to purchase the plaques, which in the past have cost around \$10.00. There is no charge for the certificates.

For previous participants see the Messier Marathon Observer's Results at:
<http://www.seds.org/messier/xtra/marathon/results.html>

Feel intimidated? Don't think you can reach high counts? DON'T WORRY! ENJOY!

2013 All Arizona Messier Marathon Coordinators

Rick Tejera: saguaroastro@cox.net

AJ Crayon: acrayon@cox.net

Saguaro Astronomy Club <http://www.saguaroastro.org/content/messier.htm>

For complete details, please visit: <http://www.saguaroastro.org/content/messier2013.htm>

 **LAST QUARTER MOON ON MARCH 4 AT 14:54**

 **NEW MOON ON MARCH 11 AT 12:52**

 **FIRST QUARTER MOON ON MARCH 19 AT 10:27**

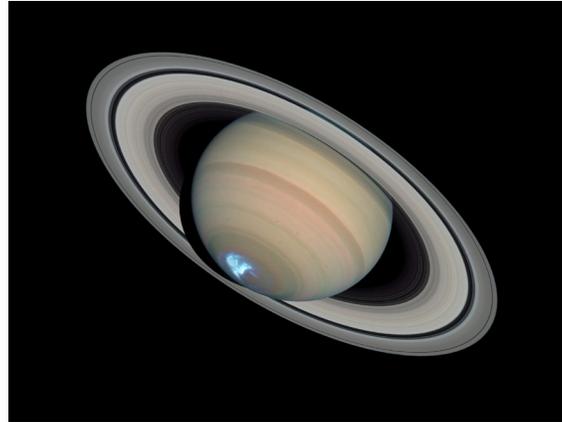
 **FULL MOON ON MARCH 27 AT 02:28**

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imaging

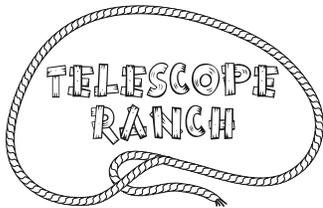


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Upcoming Meetings

No March Meeting

April 19

May 17

June 21

July 19

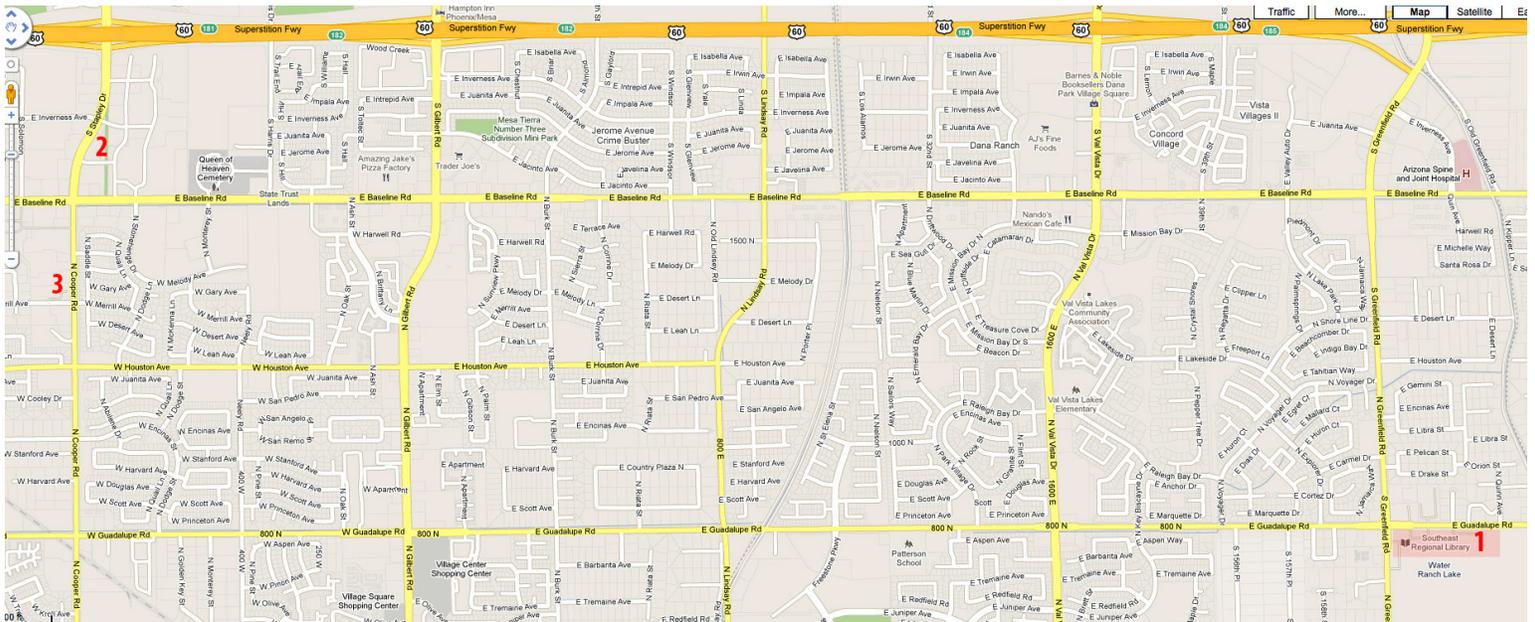
August 16

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.

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



MARCH 2013

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 - Andante Apartments Star Party

March 2 - Local Star Party at Boyce Thompson

March 5 - Tarwater Elementary Star Party

March 7 - Pomeroy Elementary Star Party

March 8 - Public Star Party & SkyWatch at
Riparian Preserve

March 9 - Deep Sky Observing Night

March 16 - All-Arizona Messier Marathon

March 22 - New Life Community Church Star
Party

March 27 - Centennial Elementary Star Party

APRIL 2013

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 6 - Local Star Party at Picketpost Trailhead

April 6 - Feathered Friends Festival

April 12 - Public Star Party & SkyWatch

April 13 - Deep Sky Observing Night

April 19 - General Meeting at SE Library

April 20 - Astronomy Day

April 26 - Roosevelt Elementary Star Party

East Valley Astronomy Club -- 2013 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):

- | | |
|---|---|
| <input type="checkbox"/> \$30.00 Individual January through March | <input type="checkbox"/> \$22.50 Individual April through June |
| <input type="checkbox"/> \$35.00 Family January through March | <input type="checkbox"/> \$26.25 Family April through June |
| <input type="checkbox"/> \$15.00 Individual July through September | <input type="checkbox"/> \$37.50 Individual October through December |
| <input type="checkbox"/> \$17.50 Family July through September | <input type="checkbox"/> \$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

Name:

Phone:

Address:

Email:

City, State, Zip:

- Publish email address on website

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):

- | | |
|--|---|
| <input type="checkbox"/> General Observing | <input type="checkbox"/> Cosmology |
| <input type="checkbox"/> Lunar Observing | <input type="checkbox"/> Telescope Making |
| <input type="checkbox"/> Planetary Observing | <input type="checkbox"/> Astrophotography |
| <input type="checkbox"/> Deep Sky Observing | <input type="checkbox"/> 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**

Tackling the Really BIG Questions

by Diane K. Fisher



How does NASA get its ideas for new astronomy and astrophysics missions? It starts with a Decadal Survey by the National Research Council, sponsored by NASA, the National Science Foundation, and the Department of Energy. The last one, *New Worlds, New Horizons in Astronomy and Astrophysics* was completed in 2010. It defines the highest-priority research activities in the next decade for astronomy and astrophysics that will “set the nation firmly on the path to answering profound questions about the cosmos.” It defines space- and ground-based research activities in the large, midsize, and small budget categories.

The recommended activities are meant to advance three science objectives:

1. Deepening understanding of how the first stars, galaxies, and black holes formed,
2. Locating the closest habitable Earth-like planets beyond the solar system for detailed study, and
3. Using astronomical measurements to unravel the mysteries of gravity and probe fundamental physics.

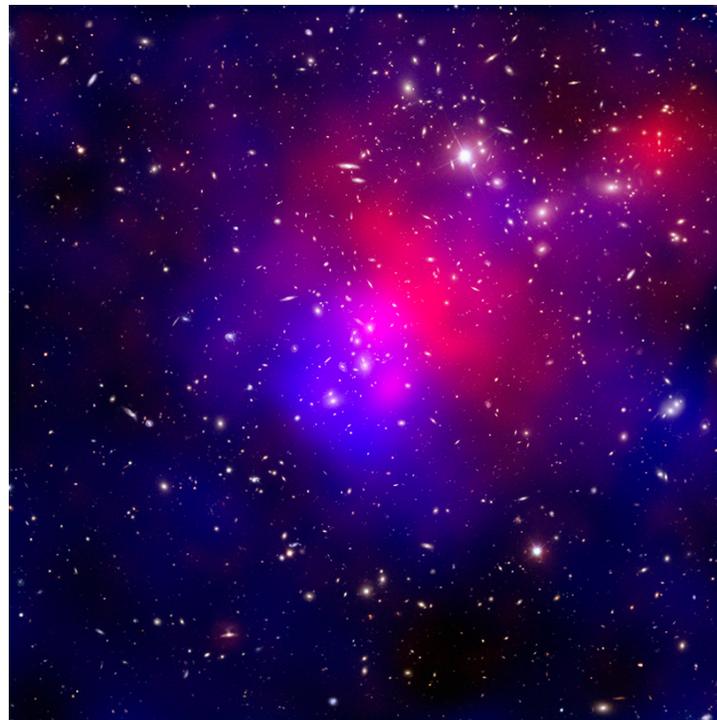
For the 2012-2021 period, the highest-priority large mission recommended is the Wide-field Infrared Survey Telescope (WFIRST). It would orbit the second Lagrange point and perform wide-field imaging and slitless spectroscopic surveys of the near-infrared sky for the community. It would settle essential questions in both exoplanet and dark energy research and would advance topics ranging from galaxy evolution to the study of objects within the galaxy and within the solar system.

Naturally, NASA's strategic response to the recommendations in the decadal survey must take budget constraints and uncertainties into account.

The goal is to begin building this mission in 2017, after the launch of the James Webb Space Telescope. But this timeframe is not assured. Alternatively, a different, less ambitious mission that also address the Decadal Survey science objectives for WFIRST would remain a high priority. The Astrophysics Division is also doing studies of moderate-sized missions, including: gravitational wave mission concepts that would advance some or all of the science objectives of the Laser Interferometer Space Antenna (LISA), but at lower cost; X-ray mission concepts to advance the science objectives of the International X-ray Observatory (IXO), but at lower cost; and mission concept studies of probe-class missions to advance the science of a planet characterization and imaging mission.

For a summary of NASA's plans for seeking answers to the big astrophysics questions and to read the complete

Astrophysics Implementation Plan (dated December 2012), see <http://science.nasa.gov/astrophysics/>. For kids, find lots of astrophysics fun facts and games on The Space Place, <http://spaceplace.nasa.gov/menu/space/>.



Clusters of galaxies collide in this composite image of “Pandora’s Cluster.” Data (in red) from NASA’s Chandra X-ray Observatory show gas with temperatures of millions of degrees. Blue maps the total mass concentration (mostly dark matter) based on data from the Hubble Space Telescope (HST), the European Southern Observatory’s Very Large Telescope (VLT), and the Japanese Subaru telescope. Optical data from HST and VLT also show the constituent galaxies of the clusters. Such images begin to reveal the relationship between concentration of dark matter and the overall structure of the universe.

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

MARCH 2013

Celestial events (from Sky & Telescope magazine, Astronomy magazine, and anywhere else I can find information) customized for Prescott, Arizona. Remember, the Moon is 1/2 degree or 30 arcminutes in diameter. All times are Mountain Standard Time.

On Friday, March 1, you can see some interesting events with Jupiter's moons. Here is the schedule:

07:41 PM Ganymede's shadow falls on Jupiter.

08:02 PM Europa moves in front of Jupiter.

09:58 PM Ganymede's shadow leaves Jupiter.

10:28 PM Europa moves from in front of Jupiter.

10:37 PM Europa's shadow falls on Jupiter.

10:51 PM Io moves behind Jupiter.

01:00 AM Europa's shadow leaves Jupiter.

01:19 AM Jupiter sets.

On Monday, March 4, the Moon is at third quarter phase and rises at 1:55 AM (Tuesday).

This is the month for comet PanSTARRS (C/2011 L4). Start looking low in the west after sunset (6:31 PM) on Thursday, March 7. During this 2 week window, the comet will get dimmer and a little higher each day. The experts thought this comet might be great, but now it looks as if it might peak at only 3rd magnitude. See skyandtelescope.com for the latest updates. Sky and Telescope magazine, March 2013, p. 50 also has good finder diagrams.

On Sunday, March 10, most of the rest of the United States goes on daylight savings time. Arizona, the astronomer's friend, avoids this silly springing forward of clocks.

On Monday, March 11, it is new Moon and you have all night to hunt for faint fuzzies. It is also a good time to look for zodiacal light. It is a large, dim band of light, caused by light scattering off tiny particles in the plane of the solar system, extending up and a little left from the setting sun. The best time to start looking for it is about 8 PM. It should also be visible for the week before.

On Sunday, March 17, about 9 PM you can see the Moon be-

tween Jupiter and Aldebaran. Look about 50 degrees above the West horizon for the trio.

On Tuesday, March 19, the Moon is at first quarter phase and sets at 2:02 AM (Wednesday).

On Wednesday, March 20, Spring begins in the northern hemisphere.

On Friday, March 22, starting about 11:00 PM, you can see the gibbous Moon pass in front of the open cluster, M 67. It will take about an hour to completely cover the cluster which is slightly smaller than the Moon (half a degree). The Moon will be quite bright so you will probably want a big (12 inch) telescope to see the stars wink out. Seeing the stars reappear on the bright limb of the Moon is probably out of reach.

On Tuesday, March 26, at 6:26 PM (21 minutes before sunset) the full Moon rises, spoiling any chance of seeing faint fuzzies tonight.

On Tuesday, March 26, you can see some interesting events with Jupiter's moons. Here is the schedule:

07:10 PM Ganymede emerges from behind Jupiter.

07:12 PM Civil twilight ends

07:41 PM Europa's shadow falls on Jupiter.

07:47 PM Europa moves from in front of Jupiter.

09:05 PM Io emerges from Jupiter's shadow.

09:35 PM Ganymede disappears in Jupiter's shadow.

10:06 PM Europa's shadow leaves Jupiter.

10:59 PM Jupiter's red spot transits.

11:56 PM Jupiter sets.

On the night of Saturday, March 30, just after midnight (Sunday), you can see a double star occulted by the Moon. The brighter star (magnitude 2.6) of Beta Scorpii (Graffias) will be covered by the bright limb of the Moon about 12:11 AM. The dimmer star (magnitude 4.9) will be covered about half a minute later. About 12:58 AM, the stars reappear from behind the dark limb of the Moon. The dim one comes out first, followed by the bright one about half a minute later. The bright star is actually a very close double, so you might notice its disappearance and reappearance occur in two, very close steps.

Looking for that perfect weekend activity?

Why not resolve to getting involved?

Contact Dave Coshow to join the staff at GRCO

Email: grco@evaonline.org



All good things must one day end, and so it is with my tenure as Newsletter Editor for East Valley Astronomy Club.

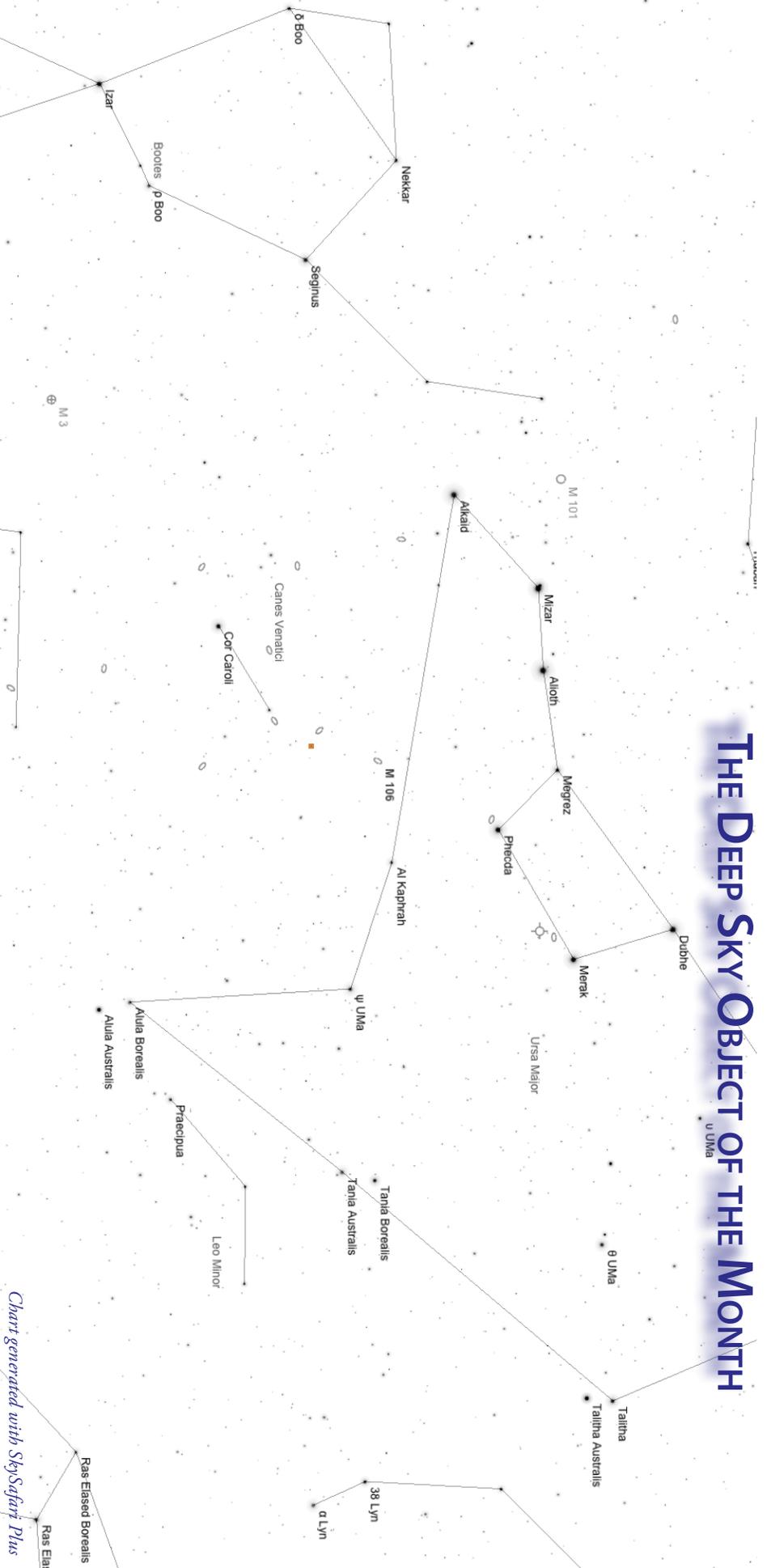
I have served the club as Board Member, Vice President, President, and as Editor for the past seven years. It is time for someone new to take the reins.

Please contact one of the primary officers to volunteer for this fun and rewarding position.

I hope you have enjoyed the newsletter!

Feel free to contact me with any questions you may have at:
news@evaonline.org

THE DEEP SKY OBJECT OF THE MONTH



Messier 106 was discovered by Pierre Mechain in 1781, but not added to Charles Messier's catalog until 1947, by Helen Sawyer Hogg. It appears reasonable to assume that Mechain had intended to add it to a future edition, along with M 105 and M 107. William Herschel catalogued M 106 as H V.43 in 1788. In amateur telescopes, Messier 106 is a fine, bright, magnitude 8.4 galaxy. Its mottled, concentrated 5' x 3' central region contains a 1' diameter core with a bright, non-stellar nucleus. The outer halo is much fainter and more diffuse, extending to 19' x 8'. Hints of spiral structure can be glimpsed in the form of two brighter extensions from the central region out into the halo, the northern extension being more prominent. Both extensions have an indistinct dark streak. Several stars appear embedded in the outer arms on both sides.

Messier 106 is a large, massive type Sb spiral system, with a tightly wound structure tilted 25° to our line of sight. This orientation explains partly why this galaxy's dust lanes are so prominent. They form a spiral pattern which can be traced into its bright central core. The spiral arms end in bright blue knots, which are young star clusters dominated by very hot, luminous, massive stars which only have a lifetime of a few million years. Also conspicuous is the yellowish remnant of an older spiral arm, whose color indicates that its more massive stars ceased to shine long ago. NGC 4217 is a possible companion galaxy of Messier 106, appearing 13' to the northeast.

M106 (NGC 4258) Spiral Galaxy in Canes Venatici

RA: 12h 19m 37.19s Dec: +47° 13' 56.5" Size: 18.6' x 7.2' Magnitude: 8.39



As one of the many benefits to becoming an East Valley Astronomy Club member, we have the following telescopes available for monthly check-out to current EVAC members:

**8 inch Orion manual Dobsonian
8 inch Orion Intelliscope Dobsonian
60mm Tasco Alt-Azimuth Refractor**

For more information, or to check out one of these scopes, please talk to:

**David Hatch
EVAC Properties Director
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.

Please send your contributions, tips, suggestions and comments to the Editor at: news@evaonline.org Contributions may be edited. The views and opinions expressed in this newsletter do not necessarily represent those of the East Valley Astronomy Club, the publisher or editor.

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East Valley Astronomy Club
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