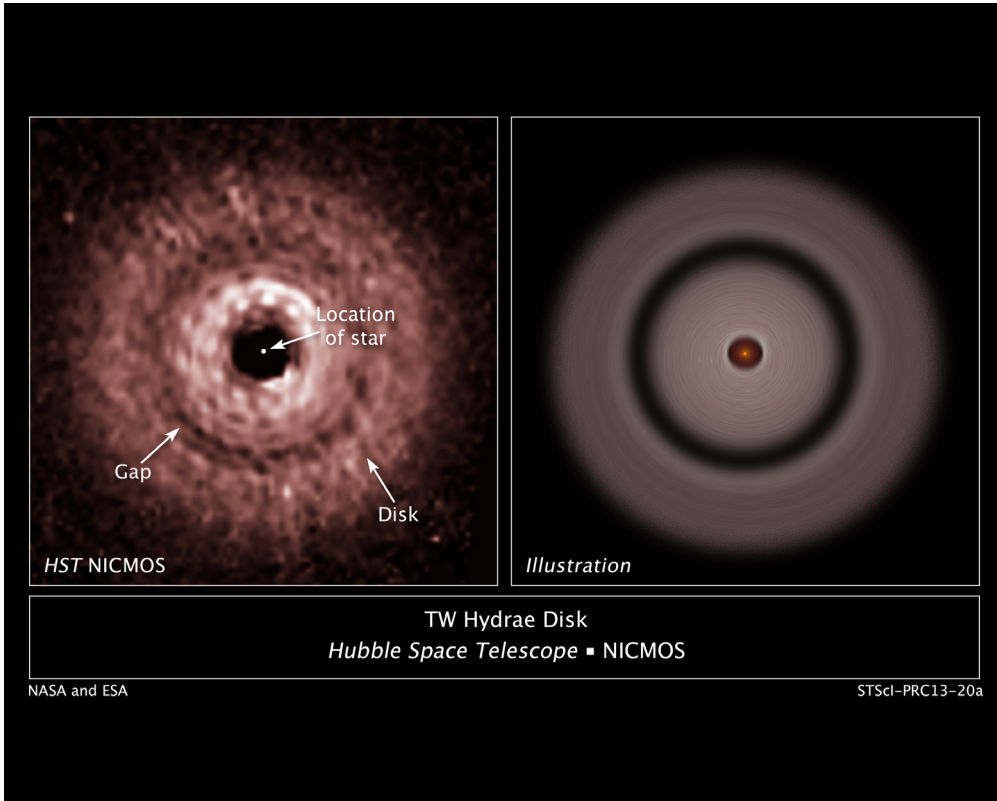


# THE OBSERVER

## East Valley Astronomy Club



### UPCOMING EVENTS:

- Deep Sky Observing Night - July 6*
- Public Star Party - July 12*
- General Meeting - July 19*
- Local Star Party - July 27*

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

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*This graphic shows a gap in a protoplanetary disk of dust and gas whirling around the nearby red dwarf star TW Hydrae.*

*The gap's presence is best explained as due to the effects of a growing, unseen planet that is gravitationally sweeping up material and carving out a lane in the disk, like a snow plow.*

## The Backyard Astronomer

### Report from the 2013 North Rim Star Party

by Bill Dellinges

Unlike last year, I did not fall down the stairs with my telescope on the first night. I brought a very manageable Celestron AVX 8" Schmidt-Cassegrain telescope. The heaviest part was the 17 pound equatorial head. Piece of cake.

However, I was informed that the day before, a star party participant had fallen on a hike, injured his head and required the same ambulance ride to Kanab, Utah I had taken last year. Thus as it turned out, I never was able to see his Televue 127mm refractor in action. What a pity I could not look

through it.

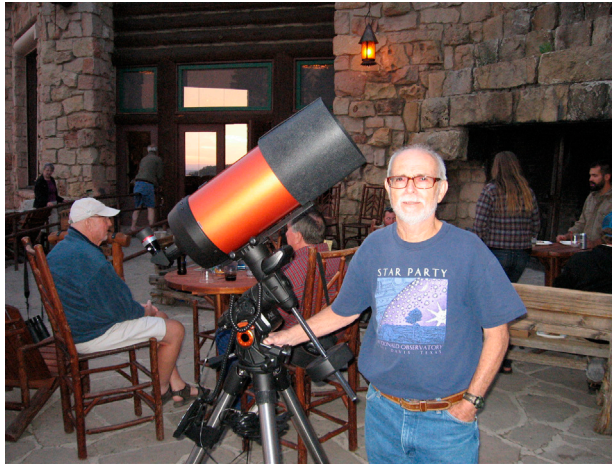
During my 5 night stay we had about a dozen scopes set up which is about as many as we have room for on the lodge veranda overlooking the canyon. Among the scopes present were two 20" Dobs, a 15" Dob, 10" Newtonian, 1976 orange tube C-8, Meade 8" LX200, TEC 140mm, and a 5" ES refractor.

**Monday June 10:** Clear and windy. Saturn was unusually sharp compared to how I see it here in the valley. This was to be the case all week. The planet was a huge

*Continued on page 2*

# The Backyard Astronomer

*Continued from page 1* hit as always. I wish I had a dollar for every time someone asked me if it was real or was there a picture inside the telescope? Many folks had never looked through a telescope before, so it was no wonder they were so amazed to see the rings of Saturn in my 8". And of course our lasers were a big hit. Later I privately observed M51 overhead with the C-8 at 145x, as I took time to mine as many photons as possible with my eye pressed against the eyecup. Wow. I could make out very nebulous spiral structure by moving the scope to and fro and using "averted imagination." It was the best view I've had of this object ever in the 8".



**Friday June 14:** Solo solar session with the Lunt 80. Nabbed about 50 unsuspecting souls. As I left, two other SAC guys set up their solar scopes. Clear at night but clouds moved in about 10pm. I showed the folks the moon, Saturn, M13, M57, and Stargate. After the crowd left I tried splitting Antares with the 8" without success (AB mag. 1.0 and 5.4, sep. 2.6"). The last time I split it was at an EVAC star party at Boyce Thompson Arboretum on June 21, 2003 with a 5" refractor at

260x. I managed a look at M11 in one of the 20" Dobs. Whoa.



**Tuesday June 11:** Morning – SAC's Chris Hanaran and I did a solar observation session with his PST and my Lunt 80. Night: Cloudy! Rats! We were only able to show the visitors Arcturus and Saturn when they occasionally penetrated the heavy cloud cover. I would call the lodge guests over when the ringed planet brightened enough to see it in the eyepiece. The small contingent of diehards still showed appreciation for the short glimpses they could get of these two objects.

**Wednesday June 12:** Cloudy again! But Arcturus and Saturn punched through the clouds with a little more frequency than the previous night. Later things opened up a bit more allowing me to show M7, NGC 6231, the doubles Beta Scorpii, Rho Ophiuchi, and Nu Scorpii (the latter, AB 1.3", is always easier to split here than at home in the 8").

**Thursday June 13:** Clear! I was on fire. Crescent moon, Saturn, M7, 8, 11, 17, 20, 26, 57, 104, NGC 6231, Cygnus X-1, Veil Nebula, Cor Caroli and "Stargate", aka Farley's Triangle (Struve 1659). This last multiple star system, a triangle within a triangle, was surprisingly well received by the public. They got a big kick out of it.



This wonderful open cluster is stunning in my 8" and 11" but in the 20" it was like a shotgun blast of stars in my face. Those monster Dobs really pull in the light.

Though the drive to the North Rim is tedious, my wife and I feel the extra mileage is worth the more remote, less crowded, smaller operation there. I also think the enchanting sound of wind blowing through the trees is just a little sweeter than the South Rim.



# Cassini Probe to Take Photo of Earth From Deep Space

NASA's Cassini spacecraft, now exploring Saturn, will take a picture of our home planet from a distance of hundreds of millions of miles on July 19. NASA is inviting the public to help acknowledge the historic interplanetary portrait as it is being taken.

Earth will appear as a small, pale blue dot between the rings of Saturn in the image, which will be part of a mosaic, or multi-image portrait, of the Saturn system Cassini is composing.

"While Earth will be only about a pixel in size from Cassini's vantage point 898 million (1.44 billion kilometers) away, the team is looking forward to giving the world a chance to see what their home looks like from Saturn," said Linda Spilker, Cassini project scientist at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif. "We hope you'll join us in waving at Saturn from Earth, so we can commemorate this special opportunity."

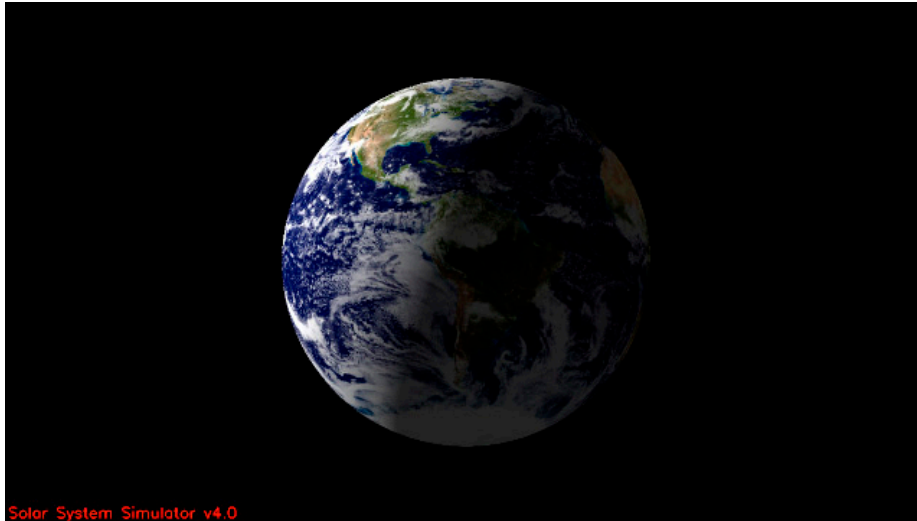
Cassini will start obtaining the Earth part of the mosaic at 5:27 p.m. EDT (2:27 p.m. PDT or 21:27 UTC) and end about 15 minutes later, all while Saturn is eclipsing the sun from Cassini's point of view. The spacecraft's unique vantage point in Saturn's shadow will provide a special scientific opportunity to look at the planet's rings. At the time of the photo, North America and part of the Atlantic Ocean will be in sunlight.

Unlike two previous Cassini eclipse mosaics of the Saturn system in 2006, which captured Earth, and another in 2012, the July 19 image will be the first to capture the Saturn system with Earth in natural color, as human eyes would see it. It also will be the first to capture Earth and its moon with Cassini's highest-resolution camera. The probe's position will allow it to turn its cameras in the direction of the sun, where Earth will be, without damaging the spacecraft's sensitive detectors.

"Ever since we caught sight of the Earth among the rings of Saturn in September 2006 in a mosaic that has become one of Cassini's most beloved images, I have wanted to do it all over again, only better," said Carolyn Porco, Cassini imaging team lead at the Space Science Institute in Boulder, Colo. "This time, I wanted to turn the entire event into an opportunity for everyone around the globe to savor the uniqueness

of our planet and the preciousness of the life on it."

Porco and her imaging team associates examined Cassini's planned flight path for the remainder of its Saturn mission in search of a time when Earth would not be obstructed by Saturn or its rings. Working with other Cassini team members, they found the July 19 opportunity would permit the spacecraft to spend time in Saturn's shadow to duplicate the views from earlier in the mission to collect both visible and infrared imagery of the planet and its ring system.



*North America and part of the Atlantic Ocean are expected to be illuminated when NASA's Cassini spacecraft takes a snapshot of Earth on July 19, 2013. This view is a close-up simulation. Image credit: NASA/JPL-Caltech*

"Looking back towards the sun through the rings highlights the tiniest of ring particles, whose width is comparable to the thickness of hair and which are difficult to see from ground-based telescopes," said Matt Hedman, a Cassini science team member based at Cornell University in Ithaca, N.Y., and a member of the rings working group. "We're particularly interested in seeing the structures

within Saturn's dusty E ring, which is sculpted by the activity of the geysers on the moon Enceladus, Saturn's magnetic field and even solar radiation pressure."

This latest image will continue a NASA legacy of space-based images of our fragile home, including the 1968 "Earthrise" image taken by the Apollo 8 moon mission from about 240,000 miles (380,000 kilometers) away and the 1990 "Pale Blue Dot" image taken by Voyager 1 from about 4 billion miles (6 billion kilometers) away.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. JPL manages the Cassini-Huygens mission for NASA's Science Mission Directorate in Washington, and designed, developed and assembled the Cassini orbiter and its two on-board cameras. The imaging team consists of scientists from the United States, the United Kingdom, France and Germany. The imaging operations center is based at the Space Science Institute in Boulder, Colo.

To learn more about the public outreach activities associated with the taking of the image, visit:

<http://saturn.jpl.nasa.gov/waveatsaturn>

For more information about Cassini, visit

<http://www.nasa.gov/cassini>

# NASA Selects Next Generation of Space Explorers

After an extensive year-and-a-half search, NASA has a new group of potential astronauts who will help the agency push the boundaries of exploration and travel to new destinations in the solar system, including an asteroid and Mars. Eight candidates have been selected to be NASA's newest astronaut trainees, hoping to be among those who are the first to launch from U.S. soil on commercial American spacecraft since the retirement of the space shuttle.

The 2013 astronaut candidate class comes from the second largest number of applications NASA has received -- more than 6,000. Half of the selectees are women, making this the highest percentage of female astronaut candidates ever selected for a class. The group will receive a wide array of technical training at space centers and remote locations around the globe to prepare for missions to low-Earth orbit, an asteroid and Mars.

"These new space explorers asked to join NASA because they know we're doing big, bold things here -- developing missions to go farther into space than ever before," said NASA Administrator Charles Bolden. "They're excited about the science we're doing on the International Space Station and our plan to launch from U.S. soil to there on spacecraft built by American companies. And they're ready to help lead the first human mission to an asteroid and then on to Mars."

The astronaut candidates are:

Josh A. Cassada, Ph.D., 39, is originally from White Bear Lake, Minn. Cassada is a former naval aviator who holds an undergraduate degree from Albion College, and advanced degrees from the University of Rochester, N.Y. Cassada is a physicist by training and currently is serving as co-founder and Chief Technology Officer for Quantum Opus.

Victor J. Glover, 37, Lt. Commander, U.S. Navy, hails from Pomona, Calif., and Prosper, Texas. He is an F/A-18 pilot and graduate of the U.S. Air Force Test Pilot School, Edwards, Calif. Glover holds degrees from California Polytechnic State University, San Luis Obispo, Calif.; Air University and the Naval Postgraduate School, Monterey, Calif. He currently is serving as a Navy Legislative Fellow in the U.S. Congress.

Tyler N. (Nick) Hague, 37, Lt. Colonel, U.S. Air Force, calls Hoxie, Kan., home. He is a graduate of the U.S. Air Force Academy, Colorado Springs, Colo.; Massachusetts Institute of Technology, Cambridge, Mass., and the U.S. Air Force Test Pilot School, Edwards, Calif. Hague currently is supporting the Department of Defense as Deputy Chief of the Joint Improvised Explosive Device Defeat Organization.

Christina M. Hammock, 34, calls Jacksonville, N.C., home. Hammock holds undergraduate and graduate degrees from North Carolina State University, Raleigh, N.C. She currently is serving as National Oceanic and Atmospheric Administration Station Chief in American Samoa.

Nicole Aunapu Mann, 35, Major, U.S. Marine Corps, originally is from Penngrove, Calif. She is a graduate of the U.S. Naval

Academy, Stanford University and the U.S. Naval Test Pilot School, Patuxent River, Md. Mann is an F/A 18 pilot, currently serving as an Integrated Product Team Lead at the U.S. Naval Air Station, Patuxent River.

Anne C. McClain, 34, Major, U.S. Army, lists her hometown as Spokane, Wash. She is a graduate of the U.S. Military Academy at West Point, N.Y.; the University of Bath and the University of Bristol, both in the United Kingdom. McClain is an OH-58 helicopter pilot, and a recent graduate of the U.S. Naval Test Pilot School at Naval Air Station, Patuxent River.

Jessica U. Meir, Ph.D., 35, is from Caribou, Maine. She is a graduate of Brown University, has an advanced degree from the International Space University, and earned her doctorate from Scripps Institution of Oceanography. Meir currently is an Assistant Professor of Anesthesia at Harvard Medical School, Massachusetts General Hospital, Boston.

Andrew R. Morgan, M.D., 37, Major, U.S. Army, considers New Castle, Pa., home. Morgan is a graduate of the U.S. Military Academy at West Point, and earned a doctorate of medicine from the Uniformed Services University of the Health Sciences, Bethesda, Md. He has experience as an emergency physician and flight surgeon for the Army special operations community, and currently is completing a sports medicine fellowship.

The new astronaut candidates will begin training at NASA's Johnson Space Center in Houston in August.

"This year we have selected eight highly qualified individuals who have demonstrated impressive strengths academically, operationally and physically," said Janet Kavandi, director of Flight Crew Operations at Johnson. "They have diverse backgrounds and skill sets that will contribute greatly to the existing astronaut corps. Based on their incredible experiences to date, I have every confidence that they will apply their combined expertise and talents to achieve great things for NASA and this country in the pursuit of human exploration."

By design, NASA's calls for astronauts are staggered so the agency can maintain continuity of experience and leadership in the astronaut corps. Since the initial astronaut class of 1959, NASA has selected and trained 330 astronauts. Most recently in 2009, NASA selected nine candidates. The 2013 group is the agency's 21<sup>st</sup> astronaut class.

NASA is engaging in a parallel path for human spaceflight exploration with U.S. commercial companies providing access to low-Earth Orbit for cargo to the space station. NASA's Commercial Crew Program also is working with commercial space partners to develop capabilities to launch U.S. astronauts from American soil in the next few years.

At the same time, NASA is developing the Orion spacecraft and the Space Launch System heavy-lift rocket designed to provide an entirely new capability for human exploration, including a mission to study an asteroid and Mars.

***Looking for that perfect weekend activity?  
Why not resolve to getting involved?  
Contact Dave Coshow to join the staff at GRCO  
Email: [grco@evaconline.org](mailto:grco@evaconline.org)***

### **18" Classic Obsession Telescope for Sale**

Purchased new in 1997 with Galaxy optics. Selling to move to a different scope. Originally the mirror tested with a Strehl ratio of 0.955 (Fringe Centers) / 0.961 (Uniform Grid) and a RMS value of 0.034. It was refigured in 2000 by Swayze Optical to remove some zones. The mirror star-tests very well. All mirrors were recoated in the last 9 months by OMI (IBAD-96 Coating process). The woodwork does show cosmetic finish issues. There are numerous upgrades to the scope. Asking \$3,200 or best offer.

Contact me at 602.291.3508 or e-mail me if you want details. [James.t.waters@cox.net](mailto:James.t.waters@cox.net)

 **NEW MOON ON JULY 8 AT 00:15**

 **FIRST QUARTER MOON ON JULY 15 AT 20:19**

 **FULL MOON ON JULY 22 AT 11:16**

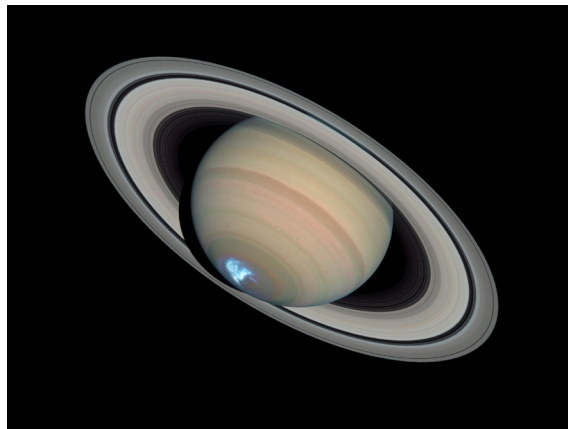
 **LAST QUARTER MOON ON JULY 29 AT 10:44**

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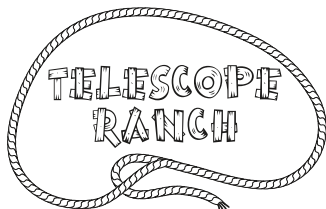


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# Upcoming Meetings

July 19

August 16

September 20

October 18

November 15

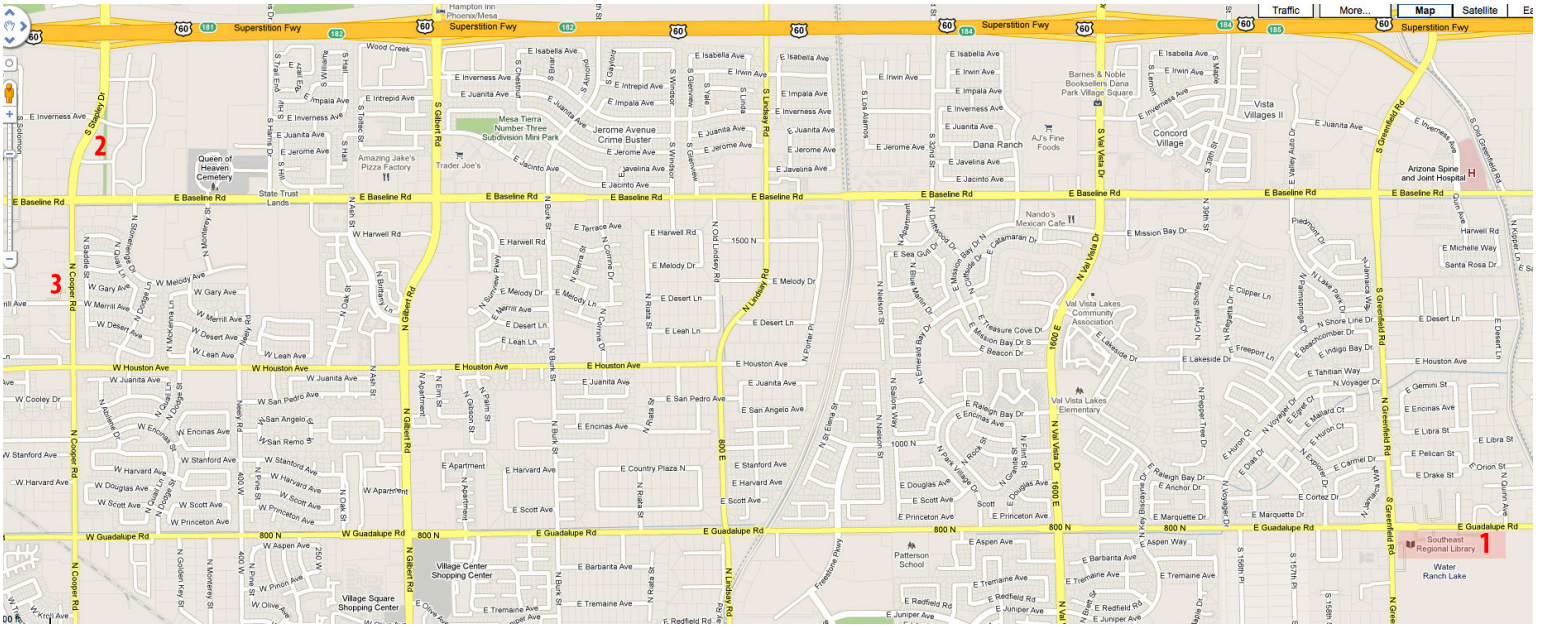
Holiday Party - TBD

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



## JULY 2013

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

**July 6** - Deep Sky Observing Night

**July 19** - General Meeting at SE Library

**July 12** - Public Star Party & SkyWatch at Riparian Preserve

**July 25** - Arizona Humane Society Camp Star Party

**July 27** - Local Star Party

## AUGUST 2013

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

**August 3** - Deep Sky Observing Night

**August 16** - General Meeting at SE Library

**August 9** - Public Star Party & SkyWatch

**August 31** - Local 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"/> <b>\$30.00 Individual</b> January through March  | <input type="checkbox"/> <b>\$22.50 Individual</b> April through June       |
| <input type="checkbox"/> <b>\$35.00 Family</b> January through March      | <input type="checkbox"/> <b>\$26.25 Family</b> April through June           |
| <input type="checkbox"/> <b>\$15.00 Individual</b> July through September | <input type="checkbox"/> <b>\$37.50 Individual</b> October through December |
| <input type="checkbox"/> <b>\$17.50 Family</b> July through September     | <input type="checkbox"/> <b>\$43.75 Family</b> 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](http://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](http://www.eastvalleyastronomy.org)**



# High Energy Spy

by Dr. Martin C. Weisskopf

The idea for the Chandra X-Ray Observatory was born only one year after Riccardo Giacconi discovered the first celestial X-ray source other than the Sun. In 1962, he used a sounding rocket to place the experiment above the atmosphere for a few minutes. The sounding rocket was necessary because the atmosphere blocks X-rays. If you want to look at X-ray emissions from objects like stars, galaxies, and clusters of galaxies, your instrument must get above the atmosphere.

Giacconi's idea was to launch a large diameter (about 1 meter) telescope to bring X-rays to a focus. He wanted to investigate the hazy glow of X-rays that could be seen from all directions throughout the sounding rocket flight. He wanted to find out whether this glow was, in fact, made up of many point-like objects. That is, was the glow actually from millions of X-ray sources in the Universe. Except for the brightest sources from nearby neighbors, the rocket instrument could not distinguish objects within the glow.

Giacconi's vision and the promise and importance of X-ray astronomy was borne out by many sounding rocket flights and, later satellite experiments, all of which provided years-, as opposed to minutes-, worth of data.

By 1980, we knew that X-ray sources exist within all classes of astronomical objects. In many cases, this discovery was completely unexpected. For example, that first source turned out to be a very small star in a binary system with a more normal star. The vast amount of energy needed to produce the X-rays was provided by gravity, which, because of the small star's mass (about equal to the Sun's) and compactness

(about 10 km in diameter) would accelerate particles transferred from the normal star to X-ray emitting energies. In 1962, who knew such compact stars (in this case a neutron star) even existed, much less this energy transfer mechanism? X-ray astronomy grew in importance to the fields of

astronomy and astrophysics. The National Academy of Sciences, as part of its "Decadal Survey" released in 1981, recommended as its number one priority for large missions an X-ray observatory along the lines that Giacconi outlined in 1963. This observatory was eventually realized as the Chandra X-Ray Observatory, which launched in 1999.

The Chandra Project is built around a high-resolution X-ray telescope capable of sharply focusing X-rays onto two different X-ray-sensitive cameras. The focusing ability is of the caliber such that one could resolve an X-ray emitting dime at a distance of about 5 kilometers!

The building of this major scientific observatory has many stories.

Learn more about Chandra at [www.science.nasa.gov/missions/chandra](http://www.science.nasa.gov/missions/chandra). Take kids on a "Trip to the Land of the Magic Windows" and see the universe in X-rays and other invisible wavelengths of light at [spaceplace.nasa.gov/magic-windows](http://spaceplace.nasa.gov/magic-windows).

Dr. Weisskopf is project scientist for NASA's Chandra X-ray Observatory. This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



*Composite image of DEM L50, a so-called superbubble found in the Large Magellanic Cloud. X-ray data from Chandra is pink, while optical data is red, green, and blue. Superbubbles are created by winds from massive stars and the shock waves produced when the stars explode as supernovas.*

## If It's Clear...

by Fulton Wright, Jr.

### Prescott Astronomy Club

*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 arc minutes in diameter. All times are Mountain Standard Time.*

On Friday, July 5, starting at about 9:30 PM, you can see Saturn's brightest satellites strung out to the east of the planet. As we move from the east to west (toward the planet), we see Titan (magnitude 9.1), Rhea (magnitude 10.3), Dione (magnitude 11.1), Tethys (magnitude 10.9), and Mimas (magnitude 13.5, very close and hard to see).

On Wednesday, July 3, between 8:15 PM and 9:00 PM, you can see Venus on the edge of the Beehive cluster (M 44), very low in the west. Venus will be easy to see. You will probably want a small (3 inch) telescope to see the stars in the cluster.

On Friday, July 5, about 9:00 PM, you can see some of Saturn's satellites lined up on the celestial east side of the planet. As you move in toward the planet from the east you encounter Titan (magnitude 9.1), Rhea (magnitude 10.3), Dione (magnitude 11.1), Tethys (magnitude 10.9), and Mimas (hard to see at magnitude 13.5).

On Sunday, July 7, it is new Moon and you have all night to hunt for faint fuzzies.

On Friday, July 12, about 9:00 PM, you can see some of Saturn's satellites lined up on the celestial west side of the planet. As you move in toward the planet from the west you encounter Titan

(quite far out, magnitude 9.2), Rhea (magnitude 10.4), Dione (magnitude 11.2), Enceladus (magnitude 12.6), and Mimas (hard to see at magnitude 13.6).

On Monday, July 15, about 9:30 PM, the first quarter Moon is just south of Spica. The Moon sets at 11:53 PM.

On Tuesday, July 16, around 4:30 AM, you can see Mars near M35, low in the east-northeast.

On Friday, July 19, at 8:30 PM, the Moon occults the double star Xi Ophiuchi (magnitudes 4.4 and 8.9, 4 arc-seconds apart). It will be hard to see the secondary in the twilight and the glare of the Moon. The star reappears from behind the bright limb of the Moon at 9:24 PM.

On Sunday, July 21, around 8:15 PM, you can see the planet Venus near the star Regulus, low in the west. They are also close the next night.

On Monday, July 22, around 4:30 AM, you can see Mars near Jupiter, low in the east-northeast. Also that day, at 7:32 PM (7 minutes before sunset) the full Moon rises spoiling any chance of seeing faint fuzzies for the night.

On Wednesday, July 24, after about 11:00 PM, you can see the planetary southeast of the Moon at its best. Libration turns that part toward us.

On Sunday, July 28, at 11:20 PM, the last quarter Moon rises.

## Wanted: Newsletter Editor

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](mailto:news@evaonline.org)

# Let's Party - July

by *Fulton Wright, Jr.* ~~~ *Prescott Astronomy Club*

*Flashy, deep-sky objects, visible in the middle of the month, at the end of astronomical twilight (when it really gets dark, about 9:25 PM this month). This list is customized for Prescott, Arizona, should work well anywhere in the state, and be usable anywhere in the old 48 states.*

## **Double Stars:**

Zeta Ursae Majoris (Mizar), magnitudes 2.2 & 3.9, separation 14 arc-seconds, distance 86 light-years. 13h24m+54d56', 50 degrees up, to the northwest, in Ursa Major.

Epsilon Lyrae (Double-Double); Epsilon 1, magnitudes 5.0 & 6.1, separation 2.1 arc-seconds; Epsilon 2, magnitudes 5.3 & 5.4, separation 2.4 arc-seconds; separation of 1&2 210 arc-seconds, distance 162 light-years. 18h44m+39d40', 65 degrees up, to the east, in Lyra.

Beta Cygni (Albireo), magnitudes 3.4 (yellow) & 4.7 (blue), separation 35 arc-seconds, distance 430 light-years. 19h31m+27d58', 50 degrees up, to the east, in Cygnus.

## **Open Clusters:**

M 11 (Wild Duck), magnitude 5.8, size 32 arc-minutes, distance 6.1 thousand light-years. 18h51m-06d16', 35 degrees up, to the southeast, in Scutum.

M 39, magnitude 4.6, size 29 arc-minutes, distance 1.1 thousand light-years. 21h32m+48d26', 35 degrees up, to the northeast, in Cygnus.

NGC 6231, magnitude 2.6, size 14 arc-minutes, distance 4.1 thousand light-years. 16h54m-41d49', 15 degrees up, to the south, in Scorpius.

M 7, magnitude 3.3, size 80 arc-minutes, distance 980 light-years. 01h22m-34d47', 20 degrees up, to the south, in Scorpius.

## **Globular Clusters:**

M 5, magnitude 5.6, size 3.5 arc-minutes, distance 24 thousand light-years. 15h19m+02d05', 55 degrees up, to the southwest, in Serpens.

M 13 (Hercules), magnitude 5.8, size 3.4 arc-minutes, distance 23 thousand light-years. 16h42m+36d28', 85 degrees up, to the northeast, in Hercules.

M 4, magnitude 5.6, size 8.7 arc-minutes, distance 7.2 thousand light-years. 16h24m-26d32', 30 degrees up, to the south,

in Scorpius.

M 22, magnitude 5.1, size 6.7 arc-minutes, distance 10 thousand light-years. 02h05m-23d54', 25 degrees up, to the southeast, in Sagittarius.

## **Galaxies:**

M 81 & M 82, magnitudes 6.9 & 8.4, sizes 25x12 & 11x4 arc-minutes, 37 arc-minutes apart, distance 12 million light-years. 09h56m+69d04', 30 degrees up, to the northwest, in Ursa Major.

M 51 (Whirlpool), magnitude 8.4, size 11x7 arc-minutes, distance 27 million light-years. 13h30m+47d12', 55 degrees up, to the northwest, in Canes Venatici.

M 101, magnitude 7.9, size 29x27 arc-minutes, distance 22 million light-years. 14h03m+54d21', 60 degrees up, to the northwest, in Ursa Major.

## **Bright Nebulae:**

M 17 (Omega), magnitude 6.0, size 46x37 arc-minutes, distance 4.2 thousand light-years. 18h21m-16d11', 35 degrees up, to the southeast, in Sagittarius.

M 20 (Trifid), magnitude 6.3, size 29x27 arc-minutes, distance 5.2 thousand light-years. 18h03m-23d02', 30 degrees up, to the southeast, in Sagittarius.

M 8 (Lagoon), magnitude 6.0, size 90x40 arc-minutes, distance 4.3 thousand light-years. 18h04m-24d23', 25 degrees up, to the southeast, in Sagittarius.

## **Planetary Nebulae:**

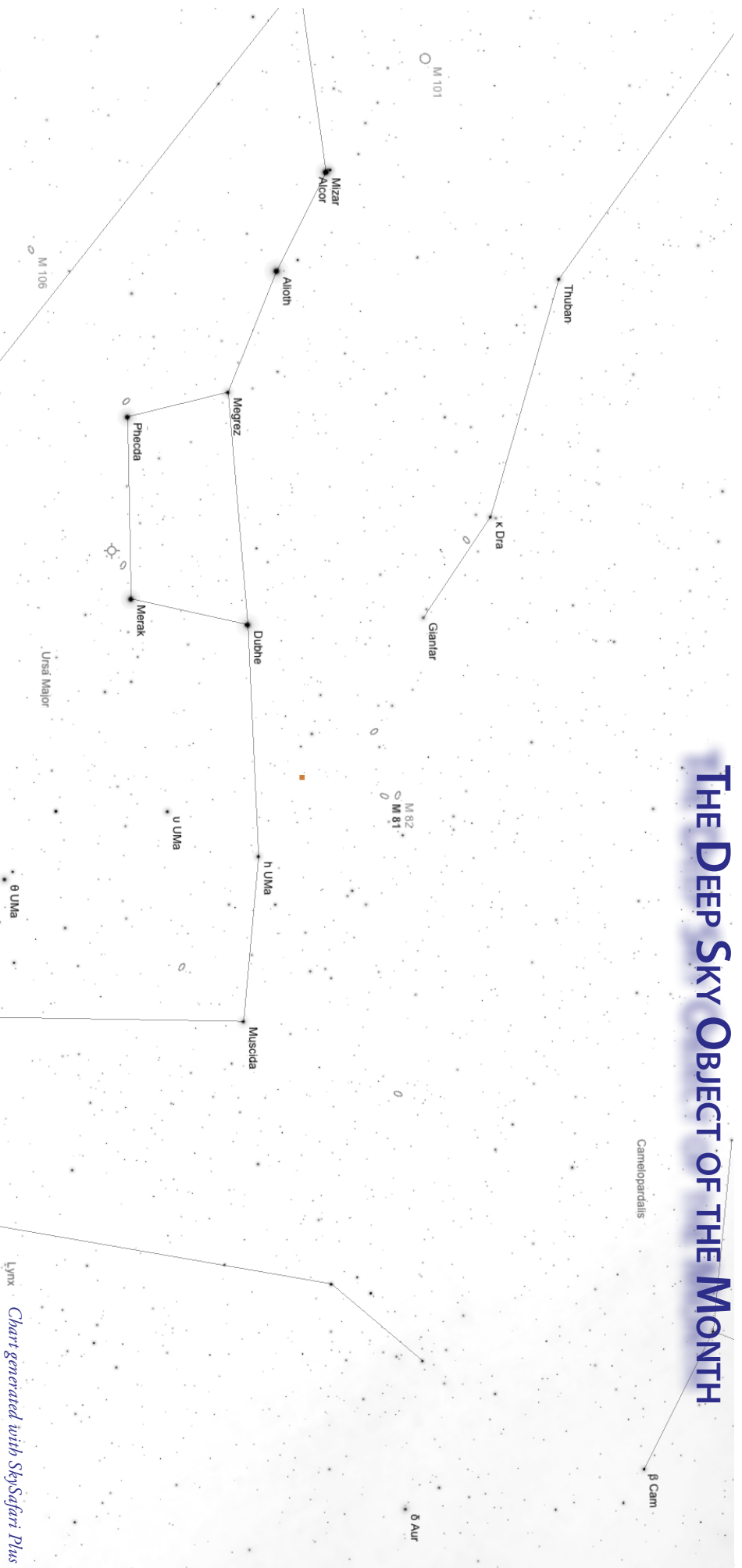
NGC 6543 (Cat's Eye), magnitude 8.1, size 0.4x0.3 arc-minutes, distance 3.2 thousand light-years. 17h59m+66d38', 55 degrees up, to the north, in Draco.

NGC 6826 (Blinking), magnitude 8.9, size 2.1 arc-minutes, distance 4.2 thousand light-years. 19h45m+50d31', 50 degrees up, to the northeast, in Cygnus.

M 57 (Ring), magnitude 8.8, size 1.4x1.1 arc-minutes, distance 1.4 thousand light-years. 18h54m+33d02', 60 degrees up, to the east, in Lyra.

M 27 (Dumbbell), magnitude 7.1, size 8x6 arc-minutes, distance 1.7 thousand light-years. 20h00m+22d43', 45 degrees up, to the east, in Vulpecula.

# THE DEEP SKY OBJECT OF THE MONTH



Messier 81 (NGC 3031) in Ursa Major is one of the most conspicuous spiral galaxies in the sky. It forms a physical pair with its neighbor, M 82, and is the dominant galaxy of the M81 group. Discovered along with M 82 by Johann Bode, and sometimes referred to as Bode's Nebula, M 81 is one of the easiest and most rewarding galaxies for amateur astronomers in the northern hemisphere.

M 81 was first discovered by Johann Elert Bode, who found it, along with M 82, in 1774. Bode described it as a "nebulous patch", which "appears mostly round and has a dense nucleus in the middle." Pierre Méchain independently rediscovered both galaxies in 1779 and reported them to Charles Messier, who added them to his catalog in 1781.

With a total visual magnitude of about 6.8, M 81 can easily be found with binoculars and small telescopes. Under exceptional seeing conditions, it has even been glimpsed with the naked eye by experienced observers. M 81 appears as an elongated, diffuse 20' x 10' oval patch in small telescopes, its periphery of rather low surface brightness. With averted vision, broad, diffuse, indistinct spiral arms can be glimpsed.

Telescopes with apertures of 8 inches or larger are needed to distinguish structure in the galaxy, and show a striking example of a "grand design" spiral galaxy. Near-perfect arms spiral into the core, a blazing 3' x 2' oval containing a bright 30"-diameter nucleus. To the SSE of the core, separated from it by a dark gap, is a thin spiral feature. The spiral arm NNW of the core is wider and much shorter. Wide dust lanes stretch outward to the edge of the disk.

## M81 (Bode's Nebula) Spiral Galaxy in Ursa Major

RA: 9h 56m 39.17s Dec: +69° 00' 2.8" Size: 24.9' x 11.5' Magnitude: 6.90



**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**



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