

# THE OBSERVER

## East Valley Astronomy Club

### From the Desk of the President *by David Douglass*

This month our fearless leader is away on vacation in the Pacific northwest, enjoying some time away from the desert heat.

This is as good a time (and place) as any to remind all of our members that this is your newsletter. The editor would much rather use local content... but 16 pages is a bit of space to fill up each month.

A special thanks to our regular contributors!

So, if you would like to have an article or image published just send it to the editor via email: [news@evaonline.org](mailto:news@evaonline.org)

The guidelines are simple. Articles can be submitted as simple text files, or you can use a word processing program of your choice. Don't insert any wild formatting, as this will be stripped away to conform to the styles used in this publication. If you

have accompanying photos it is not necessary to embed them in your text. In fact, the editor would prefer to receive them separately. Just make sure you have permission to use any images that aren't of your own creation.

Articles should be less than 2,000 words. Anything more may require it be spread over two issues, so keep that in mind when writing.

The editorial staff appreciates any attempts at spell-checking and proofreading prior to submission also.

OK then... let's get to submitting your work already.

Until the pres returns - keep looking up!



### The Backyard Astronomer The September Sky Looking East *by Bill Dellinges*

**Y**ou know what's really cool? Since metro Phoenix's light pollution pretty much destroys the western night sky for us who live eastward, it makes sense to observe to the east, no? Not only is the sky darker that way, but telescopes aimed eastward at about a 45 degree angle will have an eyepiece located at user friendly position. Dob people can dispense with ladders, refractor people don't have to live with lizards in the dirt when their eyepieces are 4 inches off the ground when aimed high, and Schmidt-Cassegrain people...oh wait, alt-az mounted

SCT's never have a problem.

And this is the perfect opportunity for binocular people with straight-through eyepieces to plow the heavens without blowing out a vertebrae in their neck.

Let's see what's out there low in the east.

What better starting place than M31, the Andromeda Galaxy, our Milky Way's nearest major galactic neighbor. At a distance of just over 2 million light years, it's so "close" it covers 2.5 degrees of sky, or about five and a half full moons. Scopes with low focal ratios

### UPCOMING EVENTS:

*Local Star Party - September 8*

*Public Star Party - September 14*

*Deep Sky Observing - September 15*

*General Meeting - September 21*

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

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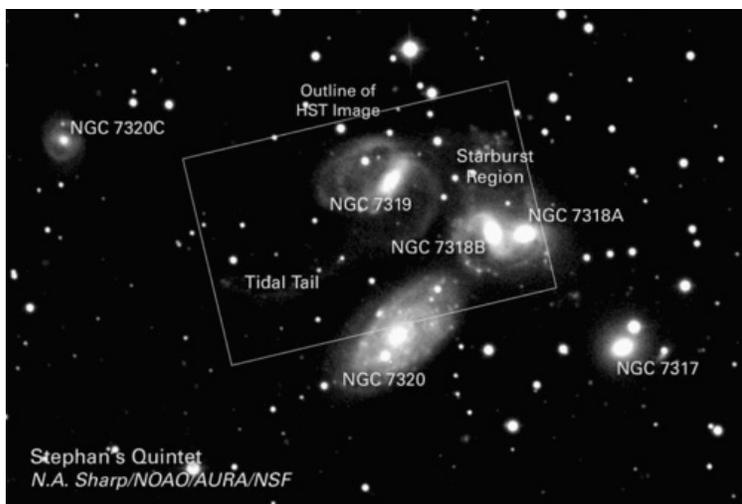
# The Backyard Astronomer

*Continued from page 1* like Newtonians and F-8 refractors do a splendid job on this elongated galaxy. "Giant" binoculars in the 10x70 or 20x100 size excel on these large objects with the additional benefit of using both eyes. Try locating M31's two satellite galaxies, M32 and NGC 205. If you can squeeze two degrees of field out of your scope, you can get all three in your eyepiece at once. NGC 205, being the dimmest of the three, can be tricky to see at first, but even 10x70 binoculars can pick it out. Look for this group midway along the constellation of Andromeda which is just off Pegasus' northeast corner.

A challenge for those who like to "go deep", is to sweep up the 9.5 magnitude galaxy NGC 7331, about 5 degrees north of Eta Pegasi. Just half a degree southwest of 7331 is the famous Stephan's Quintet (NGC 7320, et al). This tight group of five galaxies is thought to be 280 million light years away. They



M31 Credit & copyright: Tony Hallas



Cassiopeia.

Double stars abound in this corner of the sky. Perhaps the most notable is Gamma Andromedae, or Alamak, the end star in Andromeda. It's a beautiful yellow and blue pair of magnitude 2.3 and 5.0 with a separation of 9.7". Gamma is a triple star but the B component's C companion is too close now to split (mag. 6.3, sep. 0.2"). Wait till 2030 when it reaches its maximum separation of 0.5". Eta Persei, the northern most star forming a small triangle at the top of Perseus (just below the Double Cluster) is a fine triple star. The AB (mag. 3.8, 8.4, sep. 28.4") pair is easy to split and I also picked out the mag. 9.8 C component in a C-11 at 104x.

Let's conclude our low level attack on the eastern sky with an incredible quadruple star in Lacerta, the Lizard. I speak of 8 Lacertae, a multiple star that stopped me dead in my tracks one night. It's more like a small sparse star cluster than a multiple star. There's also a 5th star in the group, the AC pair, which is actually only an optical or background star. What a

shine at a feeble apparent magnitude of 13.1. Good luck (I've seen them – barely – in my C-14 at dark sky sites).

A little northeast of M31, between Perseus and Cassiopeia lies the beautiful Double Cluster, NGC 884 and 869. About 7000 light years away, I can think of no other open star cluster(s) more worthy of the description of diamonds on black velvet. It takes about a 1.5 degree field to get them both into an eyepiece field, something you should strive for to appreciate the full beauty of this pair.

While in the area, don't pass up Perseus' M34 and NGC 457 (the "E.T." or Owl cluster) and the beautiful powdery 7789 in



8 Lacertae (Struve 2922)

Telescope: 8" f5 Newtonian reflector

Camera: ST-8XME, self-guided, binned 1x1, temp -15c, camera control MaxIm DL 4.56

Image: Lumicon Red filter, 180 minutes (36 x 5 minute subs), 09/11/2011; seeing 2.5-3.3 FWHM per CCDStack

Processing: CCDStack 2.24.4110.20701, Photoshop CS 5.1

Location: Rolling Roof Observatory, Thousand Oaks, CA 91360 (+34d 13m 29s -118h 52m 20s)

shock it is to see a swarm of stars in the eyepiece when expecting only the typical binary system! By the way, it's a challenge and fun to try to identify the zigzag pattern of stars of this faint constellation created by Johannes Hevelius in 1690. Better now than when it's overhead!

# Neil A. Armstrong

## 1930 - 2012

The following is a statement from NASA Administrator Charles Bolden regarding the death of former test pilot and NASA astronaut Neil Armstrong. He was 82.

"On behalf of the entire NASA family, I would like to express my deepest condolences to Carol and the rest of the Armstrong family on the passing of Neil Armstrong. As long as there are history books, Neil Armstrong will be included in them, remembered for taking humankind's first small step on a world beyond our own.

"Besides being one of America's greatest explorers, Neil carried himself with a grace and humility that was an example to us all. When President Kennedy challenged the nation to send a human to the moon, Neil Armstrong accepted without reservation.

"As we enter this next era of space exploration, we do so standing on the shoulders of Neil Armstrong. We mourn the passing of a friend, fellow astronaut and true American hero."

Neil A. Armstrong, the first man to walk on the moon, was born in Wapakoneta, Ohio, on August 5, 1930. He began his NASA career in Ohio.

After serving as a naval aviator from 1949 to 1952, Armstrong joined the National Advisory Committee for Aeronautics (NACA) in 1955. His first assignment was with the NACA Lewis Research Center (now NASA Glenn) in Cleveland. Over the next 17 years, he was an engineer, test pilot, astronaut and administrator for NACA and its successor agency, the National Aeronautics and Space Administration (NASA).

As a research pilot at NASA's Flight Research Center, Edwards, Calif., he was a project pilot on many pioneering high speed aircraft, including the well known, 4000-mph X-15. He has flown over 200 different models of aircraft, including jets, rockets, helicopters and gliders.

Armstrong transferred to astronaut status in 1962. He was assigned as command pilot for the Gemini 8 mission. Gemini 8 was launched on March 16, 1966, and Armstrong performed the first successful docking of two vehicles in space.

As spacecraft commander for Apollo 11, the first manned lunar landing mission, Armstrong gained the distinction of being the first man to land a craft on the moon and first to step on its surface.

Armstrong subsequently held the position of Deputy Associate Administrator for Aeronautics, NASA Headquarters, Washington, D.C. In this position, he was responsible for the coordination and management of overall NASA research and technology work related to aeronautics.

He was Professor of Aerospace Engineering at the University of Cincinnati between 1971-1979. During the years 1982-1992, Armstrong was chairman of Computing Technologies for Aviation, Inc., Charlottesville, Va.

He received a Bachelor of Science Degree in Aeronautical Engineering from Purdue University and a Master of Science in Aerospace Engineering from the University of Southern California. He holds honorary doctorates from a number of universities.

Armstrong is a Fellow of the Society of Experimental Test Pilots and the Royal Aeronautical Society; Honorary Fellow of the American Institute of Aeronautics and Astronautics, and the International Astronautics Federation.

He was a member of the National Academy of Engineering and the Academy of the Kingdom of Morocco. He served as a member of the National Commission on Space (1985-1986), as Vice-Chairman of the Presidential Commission on the Space Shuttle Challenger Accident (1986), and as Chairman of the Presidential Advisory Committee for the Peace Corps (1971-1973).

Armstrong has been decorated by 17 countries. He is the recipient of many special honors, including the Presidential Medal of Freedom; the Congressional Space Medal of Honor; the Explorers Club Medal; the Robert H. Goddard Memorial Trophy; the NASA Distinguished Service Medal; the Harmon International Aviation Trophy; the Royal Geographic Society's Gold Medal; the Federation Aeronautique Internationale's Gold Space Medal; the American Astronautical Society Flight Achievement Award; the Robert J. Collier Trophy; the AIAA Astronautics Award; the Octave Chanute Award; and the John J. Montgomery Award.

In addition to his many professional accomplishments, Neil Armstrong was a loving and devoted husband, father, grandfather, brother and friend. He is survived by his wife, his two sons, a step son and step dau "We-



*Continued on page 4*

*“We are heartbroken to share the news that Neil Armstrong has passed away following complications resulting from cardiovascular procedures.*

*“Neil was our loving husband, father, grandfather, brother and friend.*

*“Neil Armstrong was also a reluctant American hero who always believed he was just doing his job. He served his Nation proudly, as a navy fighter pilot, test pilot, and astronaut. He also found success back home in his native Ohio in business and academia, and became a community leader in Cincinnati.*

*“He remained an advocate of aviation and exploration throughout his life and never lost his boyhood wonder of these pursuits.*

*“As much as Neil cherished his privacy, he always appreciated the expressions of good will from people around the world and from all walks of life.*

*“While we mourn the loss of a very good man, we also celebrate his remarkable life and hope that it serves as an example to young people around the world to work hard to make their dreams come true, to be willing to explore and push the limits, and to selflessly serve a cause greater than themselves.*

*“For those who may ask what they can do to honor Neil, we have a simple request. Honor his example of service, accomplishment and modesty, and the next time you walk outside on a clear night and see the moon smiling down at you, think of Neil Armstrong and give him a wink.”*

*- statement from the family of Neil Armstrong*

## September Guest Speaker: Brother Guy Consolmagno

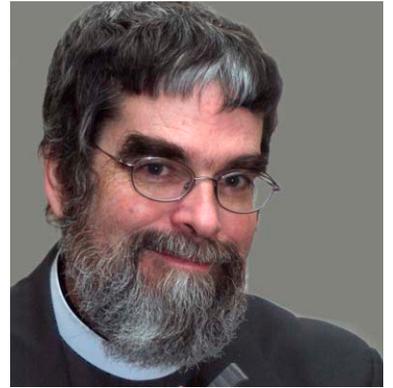
*Turn Left at Orion* has become one of the most popular guides to using a small telescope ever published, with more than 100,000 copies sold to date... but the adventures of getting it written and published were almost as much fun as all the observing we did for the book! Guy will tell stories of the steps, and missteps, that he and his coauthor Dan Davis went through into various editions of their book.

(Watch out for those pesky wabbits!)

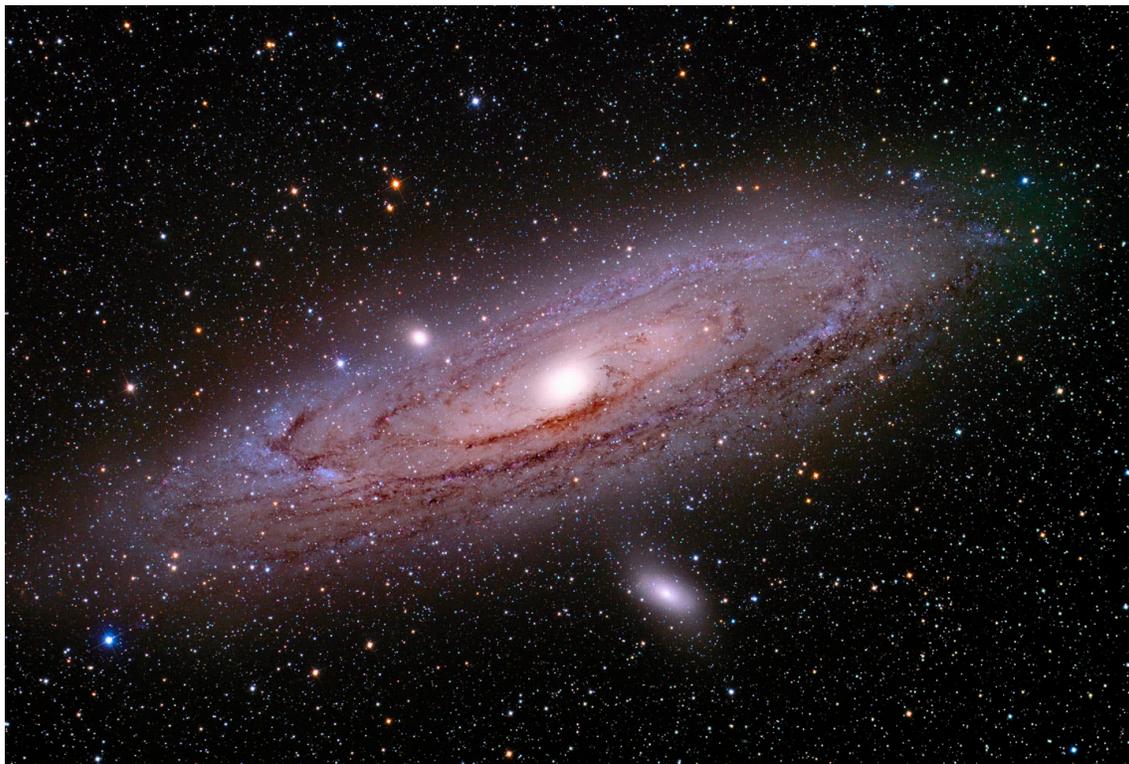
Brother Guy Consolmagno SJ is a planetary scientist and Curator of Meteorites at the Vatican Observatory.

A native of Detroit, he studied at MIT (SB 1974, SM 1975) and Arizona (PhD 1978), worked at Harvard and MIT, served in the Peace Corps, and taught university physics before entering the Jesuits in 1989. At the

Vatican Observatory since 1993, he studies the physics of meteorites and asteroids, and has written several popular books on astronomy and his life as a Jesuit scientist. He is a past officer of the International Astronomical Union, who named asteroid 4597 Consolmagno in his honor.



Brother Consolmagno's talk is entitled *Twenty-Five Years of Turning Left: Are We There Yet?*



*M31: the Andromeda Galaxy Image courtesy of Jon Christensen*

☾ **LAST QUARTER MOON ON SEPTEMBER 8 AT 06:16**

○ **NEW MOON ON SEPTEMBER 15 AT 19:11**

☽ **FIRST QUARTER MOON ON SEPTEMBER 22 AT 12:41**

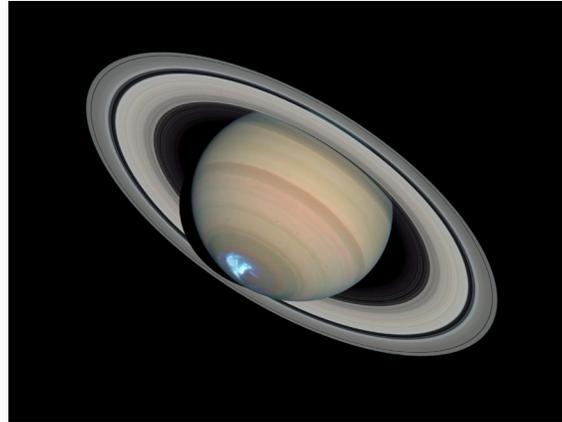
● **FULL MOON ON SEPTEMBER 29 AT 20:19**

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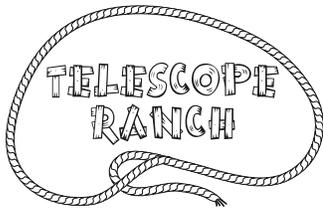


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# Upcoming Meetings

September 20

October 19

November 16

December **Holiday Party**

January 18

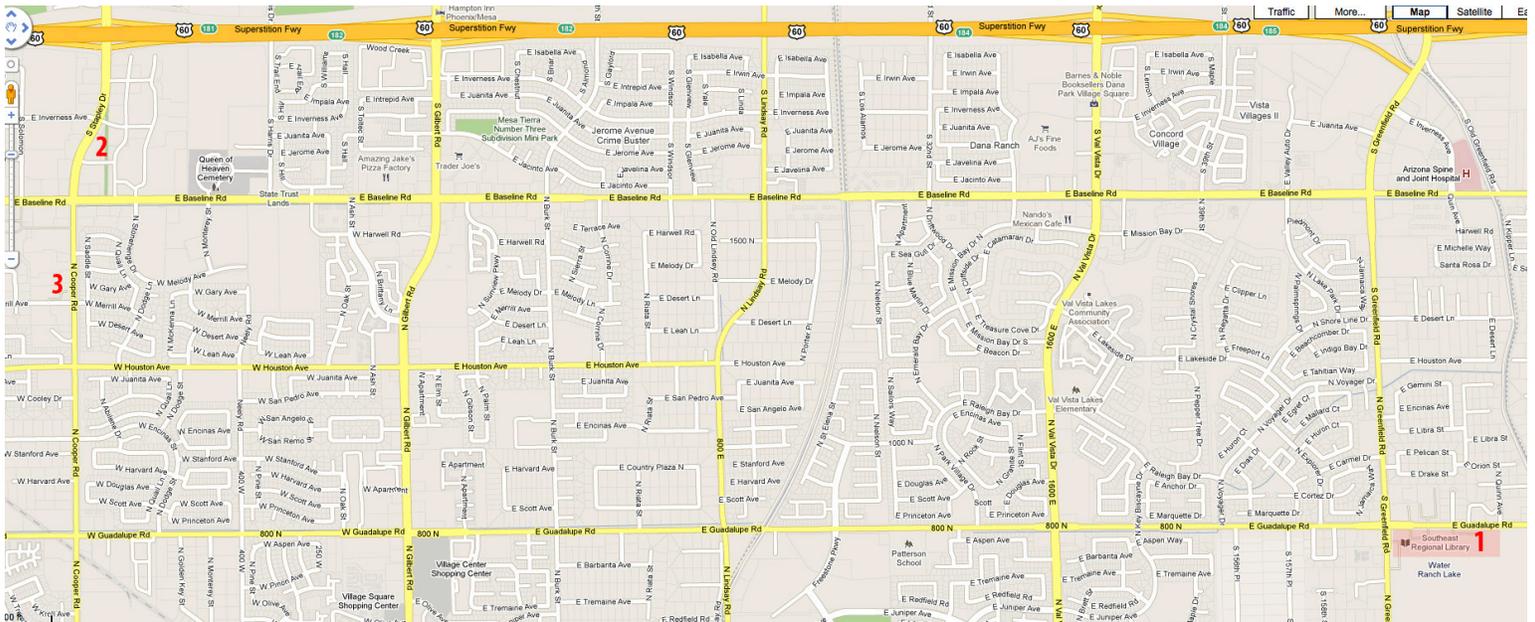
February 15

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



## SEPTEMBER 2012

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

**September 8** - Local Star Party at Boyce Thompson

**September 14** - Public Star Party & SkyWatch at Riparian Preserve

**September 15** - Deep Sky Observing Night

**September 21** - General Meeting at SE Library

**September 22** - Arizona Museum of Natural History Star Party

**September 27** - Dobson Academy Science Night

## OCTOBER 2012

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

**October 6** - Local Star Party at Boyce Thompson

**October 12** - Public Star Party & SkyWatch

**October 12-14** - All-Arizona Star Party

**October 13** - Deep Sky Observing Night

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

# East Valley Astronomy Club -- 2012 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.evaonline.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

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**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)**



# A Brand New Age: Queue Observing at Mt. Paranal

by Dr. Marc J. Kuchner

First a caravan of white observatory cars arrives, winding up the narrow road to the 2600-m- (~8500-foot-) high summit. Then the shutters around the domes open, and rays from the setting sun alight on colossal mirrors and metal struts.

It's the beginning of another busy night at Mt. Paranal, Chile, where I am learning about new, more efficient ways of managing a modern observatory.

I stepped into the observatory's control room to soak up some of the new, unfamiliar culture. Here, under florescent lights and drop ceilings are banks

of computer screens, one bank to control each of the four big telescopes on the mountaintop and a few others too. At each bank sits two people, a telescope operator and an astronomer.

The layout of this workspace was not unfamiliar to me. But the way these Mt. Paranal astronomers work certainly was. When I was cutting my teeth at Mt. Palomar observatory in California, I would only go to the telescope to take my own data. In stark contrast, everyone observing at Mt Paranal tonight is taking data for someone else.

The Mt. Paranal astronomers each spend 105 nights a year here on the mountain performing various duties, including taking data for other astronomers. The latter, they call "executing the queue." Headquarters in Germany decides what parts of the sky will have priority on any given night (the queue). Then the Mt. Paranal astronomers march up the mountain and carry out this program, choosing calibrators,

filling the log books, and adapting to changing conditions. They send the data back to headquarters, and from there it makes its way out to the wider astronomical community for study.



This new way of working allows the Mt. Paranal astronomers to specialize in just one or two telescope instruments each. Surely this plan is more efficient than the old-fashioned way, where each of us had to learn every instrument we used from scratch—sifting through

manuals at 3:00 AM when the filter wheel got stuck or the cryogen ran out, watching precious observing time tick away. Here at Mt. Paranal, much of the work is done in a big room full of people, not off by yourself, reducing some dangers of the process. Also, queue observing cuts down on plane travel, an important step for cutting carbon emissions.

It's a brand new age, I thought as I watched the giant domes spin in the silent, cold Chilean night. And maybe with queue observing, some of the romance is gone. Still, my colleagues and I couldn't help saying as we stared out across the moonlit mountains: I can't believe how lucky we are to be here.

*Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at <http://www.science.nasa.gov/astrophysics/>. Kids can explore these topics at <http://spaceplace.nasa.gov/space>.*

## If It's Clear...

by *Fulton Wright, Jr.*

*Prescott Astronomy Club*

SEPTEMBER 2012

*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 Saturday, September 1, after about 8:30 PM, you can see the terrestrial southeast of the Moon at its best. Libration tips that part of the Moon towards us.

On Saturday, September 8, about 3:00 AM, the Moon will be passing about 1 degree away from Jupiter. The pair rises about 11:10 PM the night before, and twilight interferes about 5:00 AM. The Moon is at last quarter phase.

On Wednesday, September 12, about 2:45 AM, three objects rise in the east-northeast. On the left is the Beehive cluster, in the center is Venus, on the right is the thin crescent Moon. Twilight begins to interfere with the view about 5:00 AM.

On the night of Thursday, September 13, you can see a number of events with Jupiter's moons. Here is the schedule:

- 10:46 PM Jupiter rises.
- 11:32 PM Io's shadow falls on Jupiter.
- 12:50 AM Io moves in front of Jupiter.
- 1:39 AM Io's shadow leaves Jupiter.
- 2:30 AM Europa moves into Jupiter's shadow.
- 2:57 AM Io moves from in front of Jupiter.
- 4:48 AM Astronomical twilight starts.
- 5:00 AM Europa emerges from Jupiter's shadow.

5:15 AM Europa disappears behind Jupiter.

5:18 AM Nautical twilight starts.

On Saturday, September 15, it is new Moon, so you have all night to hunt for faint fuzzies.

On the night of Monday, September 17, from 11:48 PM to 1:41 AM, you can watch Ganymede's shadow cross the southern edge of Jupiter.

On Saturday, September 22, the Moon is at first quarter phase and sets at 11:49 PM. This is a good night to find Uranus. All night it will be within 1 arc-minute of 44 Piscium which happens to be the same brightness, magnitude 5.7. See Sky & Telescope, September 2012, p. 50 for a finder chart. Uranus is at opposition on the night of September 28.

On Saturday, September 29, at 5:53 PM (23 minutes before sunset) the full Moon rises, spoiling any chance of seeing faint fuzzies for the night. However, tonight you can watch 2 shadow transits of Jupiter's moons. Here is the schedule:

- 9:46 PM Jupiter rises and Io's shadow falls on the planet.
- 11:00 PM Io moves in front of Jupiter.
- 11:55 PM Io's shadow leaves Jupiter.
- 1:08 AM Io moves from in front of Jupiter.
- 2:46 AM Europa's shadow falls on Jupiter.
- 5:01 AM Astronomical twilight starts.
- 5:06 AM Europa's shadow leaves Jupiter.
- 5:16 AM Europa moves in front of Jupiter.
- 5:30 AM Nautical twilight starts.

***Looking for that perfect weekend activity?***

***Why not resolve to getting involved?***

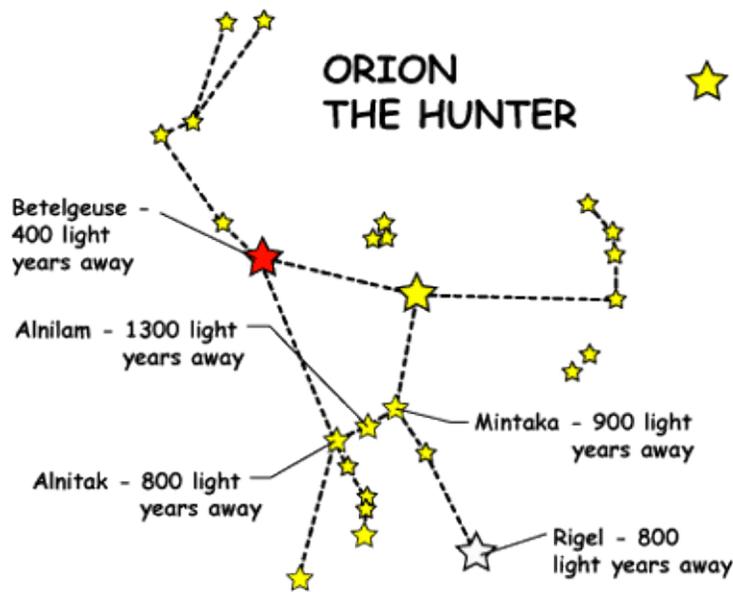
***Contact Dave Coshow to join the staff at GRCO***

***Email: [grco@evaonline.org](mailto:grco@evaonline.org)***

# What ARE constellations anyway?

A constellation is a group of stars like a dot-to-dot puzzle. If you join the dots—stars, that is—and use lots of imagination, the picture would look like an object, animal, or person. For example, Orion is a group of stars that the Greeks thought looked like a giant hunter with a sword attached to his belt.

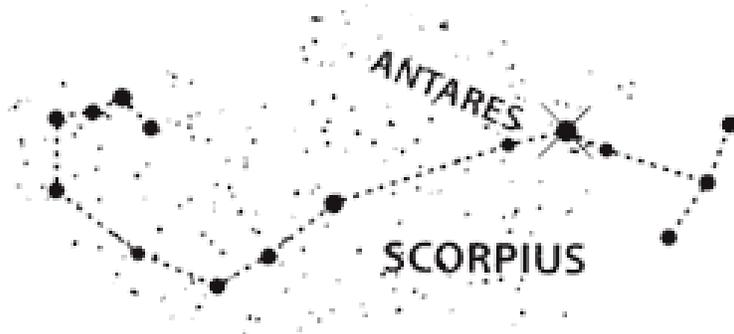
Other than making a pattern in Earth's sky, these stars may not be related at all. For example, Alnitak, the star at the left side of Orion's belt, is 817 light years away. (A light year is the distance light travels in one Earth year, almost 6 trillion miles!) Alnilam, the star in the middle of the belt, is 1340 light years away. And Mintaka at the right side of the belt is 916



★ south from the Star Finder charts. The Star Finder charts show the sky at about 10 PM for the first of the month, 9 PM for the middle of the month, and 8 PM for the last of the month. These are local standard times. For months with Daylight Savings Time, star chart times are an hour later.

The star charts are maps of the sky overhead. So, to get the directions lined up, hold the map over your head and look up at it, and turn it so the northern horizon side is facing north.

If you live where big city lights drown out the beauty of the stars, you may see only a few of the brightest stars and planets. How sad! But see if you can find at least one or two constellations on a clear, Moonless night.



light years away. Yet they all appear from Earth to have the same brightness.

Even the closest star is almost unimaginably far away. Because they are so far away, the shapes and positions of the constellations in Earth's sky change very, very slowly. During one human lifetime, they change hardly at all. So, since humans first noticed the night sky they have navigated by the stars. Sailors have steered their ships by the stars. Even the Apollo astronauts going to the Moon had to know how to navigate by the stars in case their navigation instruments failed.

## Finding the Constellations

We see different views of the Universe from where we live as Earth makes its yearly trip around the solar system. That is why we have a different Star Finder for each month, as different constellations come into view. Also, as Earth rotates on its axis toward the east throughout the hours of the night, the whole sky seems to shift toward the west.

The Star Finder charts are for a latitude of 34° N, which is about as far north of the equator as Los Angeles, California. (Charts are from The Griffith Observer magazine.) The farther north you are, the more the constellations will be shifted



# THE DEEP SKY OBJECT OF THE MONTH

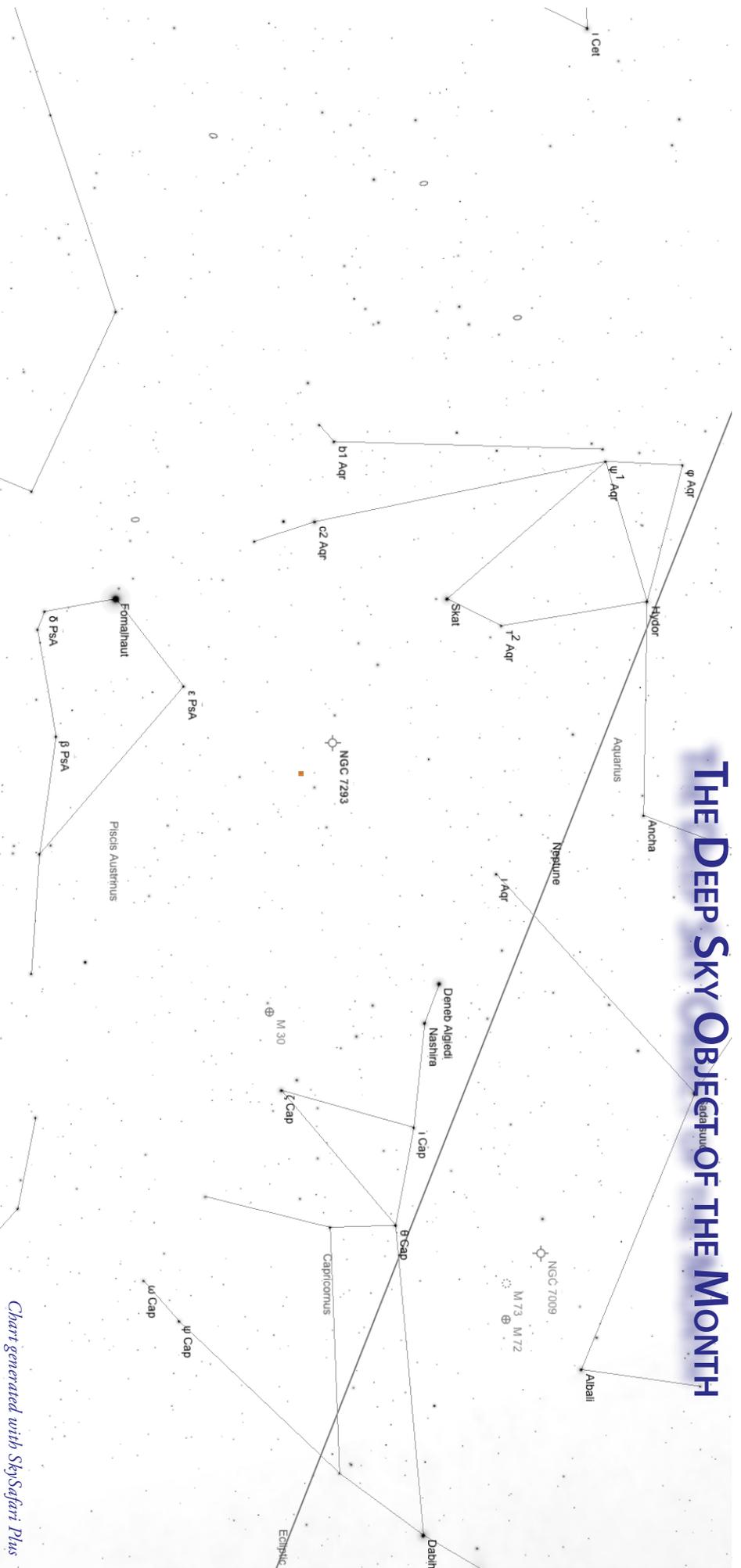


Chart generated with SkySafari Plus

The Helix Nebula, also known as NGC 7293, is a large planetary nebula in the constellation of Aquarius. It is perhaps the nearest planetary nebula to our Solar System.

Overlooked by previous astronomers, notably Frederick William Herschel, this nebula was discovered by Karl Ludwig Harding some time before 1824. NGC 7293 is one of the largest planetaries known: it covers an area 16' in diameter, more than half of that of the full moon; its halo extends even further to 28'. Although the nebula is quite bright, its light is spread over this large area so it has extremely low surface brightness. It is not an easy object for visual observing. (This is perhaps why the Herschels never observed it.) Its ring structure, so conspicuous in photos, is not easy to detect visually.

In binoculars and rich field scopes, the planetary is a large ghostly disk, vaguely circular, with a much fainter center. In larger instruments it is very challenging, so use a very low power eyepiece. An O-III or UHC filter and averted vision can help quite substantially. Three 10th magnitude stars are involved in the disk.

The Helix Nebula is the closest of all planetary nebulae, lying at a distance of about 650 light years. The nebula spans an area 2.5 light years across. Currently, NGC 7293 is estimated to be 10,600 years old, based on a measured expansion rate of 31 km/sec.

The Helix Nebula is shaped like a prolate spheroid, with strong density concentrations along its equatorial plane. The outermost ring is flattened on one side due to its collision with the interstellar medium. The Helix Nebula was the first planetary nebula discovered to contain knots.

## NGC 7293 (Helix Nebula) Planetary Nebula in Aquarius

RA: 22h 30m 24.13s Dec: -20° 45' 54.3" Size: 14.7' x 12.0' Magnitude: 7.59

# EVAC Auction

At the September meeting we will be holding an auction for five telescopes that have been donated to us. All telescopes are auctioned as-is.

1. 60 mm Tasco refractor on alt/az mount.
2. 4.5 inch, f/8 Celestron short tube reflector on equatorial mount.
3. 6 inch, f/5 Custom short tube reflector on equatorial mount.
4. 6 inch, f/8 Celestron Dobsonian. This has good optics.
5. 16 inch, f/4.5 Celestron sonotube Dobsonian. This has good optics



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