Volume 34 Issue 8

August 2020

The Observer

M7 Open Star Cluster in Scorpius - APOD 05/05/2002
Image Credit: N. A. Sharp, REU Program, AURA, NOAO, NSF

Upcoming Events:

Some meetings will be held online.

EVAC Meeting via Zoom - August 21

Featured Speaker is Babak Tasfreshi a National Geographic award winning Photographer

Inside this Issue:

From the Desk of the President

by Gordon Rosner

Greetings from your President.

I sure hope everyone is doing well and keeping healthy. Here we are still deep in public health concerns. As I mentioned last month, it's been a long time since we've been able to get together for our usual group functions we enjoyed so much. Sadly it still looks like that is going to continue for quite some time. So, all EVAC in-person group activities are still cancelled and we are still uncertain when they will return. This also applies to our GRCO Observatory. Your Leadership Team is still monitoring other Arizona astronomy clubs for any positive thoughts and still thinking about possible operations on how to reopen but exactly how and when is still unknown at this time. As always, check our website for the latest information.

May I remind everyone again that any in-person gatherings are up to individuals and none are EVAC sponsored events. This also applies to any gatherings at the Picket Post Trailhead. Those gatherings are personal decisions and proper safety precautions must be observed by each individual. Any group gatherings are entirely personal decisions with no EVAC endorsement, guidance or oversight at this time.

For those who had signed up and paid for April's canceled MMT Tour, a new date cannot be determined. So, the club's Board of Directors has authorized to reimburse directly from club

From the Desk of the President

by Gordon Rosner

Continued from page 1

funds to all those who prepaid. The MMT has agreed to reimburse the club but cannot give us a firm date when that will happen. So, individual club refund checks will be mailed directly to all those who prepaid. To make sure our Treasurer has the correct and current address for those who had paid, please send the address to our Treasurer via the 'Contact Treasurer' link at the bottom of the main page of our website.

Comet Neowise (C/2020 F3). What a great distraction from our not-so-nice realities. It basically has now said goodbye to us from an exciting visit past Earth. There's some great photos all over the internet and lots on our club's Facebook page taken by our own club members. Check those out. I hope everyone had a chance to see it in person.

However, don't put those telescopes back in the corner of the closet! Saturn and Jupiter have now taken center stage for us. Just like me, I'm sure lots of you started your astronomy passion by seeing Saturn through a telescope for the first time. Even us 'Old Hats' should take a look and relive that long ago moment when we first got hooked. If you can, share that moment with others and they may also get hooked. I'm sure you will be telling them "Yep! That's really up there!".

The club continues to do monthly General Membership Meetings online via the Zoom computer based platform. The format mirrors the usual meeting process with anagenda, business updates, member presentations, then our main presentation. Because it's online, we now have the ability to have main presenters from anywhere. Our online meetings now have really expanded our pool to pull from. See Wayne's column as an example of this regarding July's meeting. The August meeting will be held on Friday, 21 August starting at 7:30PM. The featured Speaker is Babak Tafreshi - A National Geographic award winning photographer working with the National Geographic Sky&Telescope magazine, and the European Southern Observatory (ESO).

As a reminder, all those who have already received a Zoom meeting link for previous meetings from our Vice President Tom Mozdzen are on the email distribution list for future meeting links and you will automatically receive a link via email for the August meeting before the meeting. If you have never received a link, e.g. the August meeting is your first time requesting a link, you need to ask for the link by sending an email to vp@evaconline.org requesting to be added to the Zoom monthly meeting link distribution list. You then will receive the specific link for each future meeting.

During these online meetings all attendees remember that only the Zoom panelists, meaning those directly involved with the presentations, can be seen and heard by the audience. Attendees cannot be seen or heard by others in attendance. However, look for buttons on your screen labeled "Chat" and "Q & A". The "Chat" button allows you to enter comments for all to see when they open this same function. If you have a question, use the "Q & A" button to enter a specific question for the presenter. Questions are monitored and the presenter is asked them at the end of the presentation by either Tom or myself.

If you're interested in doing a short ten minutes or so member presentation during these online meetings, please let me know via an email to president@evaconline.org. All you need is a PowerPoint, Keynote or similar format and an internet connection for your computer that has a microphone. You'll receive a Zoom connection link from Tom and if not familiar with Zoom presentations, we'll tell you what buttons to click. You can also check in a little early and get a little practice in. You then just click through your presentation and present as usual.

Our club is still running strong as our Leadership Team continues to drive needed club actions. However, with no group gatherings, some of you may be asked by interested astronomy enthusiasts "Why should I join EVAC now with everything cancelled?". We came up with a reply you can give/send them:

"Currently, because of public health concerns, the East Valley Astronomy Club (EVAC) has temporarily suspended all in-person events until further notice. The club remains strong and operational with the vision to return to normal operations after safety measures are validated and implemented. EVAC is a registered 501c3 non-profit organization. Our stated purpose, from our Constitution and ByLaws, is to further the education of our members and the public in astronomy. Towards those ends we have: Constructed a 16" telescope observatory at the Gilbert Riparian Preserve which we staff to allow for free observing

From the Desk of the President
by Gordon Rosner

Continued from page 2

by the public every Friday and Saturday night, weather permitting; We take our personal telescopes to schools and other organizations for science nights at no cost; We have top quality speakers on astronomy subjects at each of our monthly meetings; We, with other clubs, organize and sponsor formal and informal viewing events at dark sites in rural areas; We hold auctions of donated equipment to provide a "second life" for astronomy equipment; We maintain a club website containing resources applicable to all levels of astronomy enthusiasts; We have various observing programs for all levels that members can do on their own with plaques given for completions: And we organize occasional tours of various astronomy facilities across the state. These activities are supported by club members and funded by donations and club membership fees. Therefore, we invite those who have an astronomy passion at any level to share their passion with us and support astronomy by becoming an EVAC member via a yearly membership dues of $30 or a yearly family membership dues of $35. Membership renewals are due in January of each year with first time dues pro-rated depending on the month of membership. Even during these troubled times, EVAC club membership is still a valuable asset with resources available to anyone who enjoys "Looking Up". Even during these reduced operations times, please support the club by becoming a member."

"Keep your feet on the ground and keep reaching for the stars."

Your President,

Gordon Rosner

EVAC Zoom Meeting Notes for 2020 July 17, at 07:30 P.M. AZ Time
by Wayne Thomas

President Gordon Rosner welcomed those in the "audience" to the Zoom meeting at 7:30 p.m. with 71 in attendance. He encouraged everyone to follow Comet NEOWISE (C/2020 F3) as it becomes visible in the evening sky. It is best viewed with binos from a dark sky with a clear view of the NW horizon. For those wishing to view the return, the wait will be about 6,800 years.

Gordon emphasized that we are still an active club maintaining the observatory, paying our bills, keeping the website running and publishing the Observer monthly. However, we will continue to not hold meetings until it is safe to do so, which is still unknown at this time.

For those wishing to observe from Picket Mountain trailhead, that is a personal choice and not an EVAC sponsored activity. Those observing there do so of their own volition.

For current information about the club and GRCO, go to the top of the website's home page. Currently posted -- all in person meetings are cancelled in concern for the health and wellbeing of our members. When it is safe to resume in person meetings, it will be posted at the top of the EVAC website home page (www.evaconline.org).

For our Zoom meetings we are still doing member presentations. If you would like to share what you are doing, send a note to Gordon at president@evaconline.org. Gordon then turned the meeting over to Claude Haynes for a presentation on "Starlink – The Variable Constellation."

Claude first described the Vera Rubin Observatory in Chili and its mission objectives. To meet these, the primary mirror has two surfaces with two different focal lengths allowing the telescope to image a large area of the sky with each pointing. The CCD detector measures almost one meter is size. The planned imaging cycle is a 15 second exposure every 20 seconds. This will proceed throughout the night for every clear night.

With the launching of the starlink satellites, every exposure is likely to contain satellite trails. Since the logic to alert astronomers of significant events is based on sudden appearances of a change in the image, these satellite trails would overwhelm the system with false alerts. The problem becomes one of mitigation. SpaceX and astronomers are working together to find solutions. However, with Amazon and Telnet, and others entering the field, the night skies may never again be free of satellite trails across astronomer's images.

EVAC Zoom Meeting Notes for 2020 July 17, at 07:30 P.M. AZ Time

by Wayne Thomas

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Claude answered the question about why twilight was the best time to detect near earth asteroids, and why this was the worst time for satellite trails across images. Asteroids and comets are in general closest to the Sun and therefore most visible just prior to sunrise or just after sunset. This is also the time when Earth orbiting satellites are in sunlight and therefore brightest.

Tom Mozdzen then introduced the main speaker, Dr. Jessie Christiansen to speak on "On the Road to a Billion Planets."

Dr. Christiansen began by reviewing our solar system and distinguishing extrasolar planets from members of our solar system. Our system has 8 planets spread out with the gas giants furthest from our star and the rocky planets closest to our star. Counting all the objects larger than dust, there are over 700,000 known objects found to date.

The history of thinking about other solar systems besides our own goes back to the ancient Greek philosophers Plato and Aristotle. However they had no tools to validate one way or the other. Giordano Bruno suggested in 1592 that there was nothing unique about our solar system and there should be countless other systems. However, those other systems would be very hard to detect. Otto Struve reasoned in 1952 that just like binary stars which cause Doppler shifts in their light while in orbit, so should massive planets like Jupiter orbiting their stars produce Doppler shifts. Not until 1995 was the first planet found by this method vindicating Struve's prediction.

Then she suggested that discoveries of extrasolar planets may follow a law similar to Moore's law which predicted the doubling of computing power every 2 years. If so, Eric Mamajek predicted the number of discovered planets would double every 27 months. If this turns out to be reasonably accurate, the number of extrasolar planets discovered may reach one million by 2034 and one billion by 2056 (Mamajek's Law). So far more than 4,000 exoplanets have been confirmed.

The Kepler project was to determine how many Earth-like planets there are in our neighborhood of the galaxy. An assumption going in was that our star, the Sun, was typical. Other Sun like stars would behave like our Sun – some more active and some less active. However, it turns out our Sun is quiet compared to other similar stars.

To find candidate exoplanets, Kepler stared at the same 10 degree by 10 degree field in Cygnus for about 10 years recording star brightness continuously. When the star brightness dimmed in a periodic way due to a planet transit, Kepler had found a candidate exoplanet. Before the Kepler mission the plot of planet size versus distance from its Sun showed most detected exoplanets were large and close to their Sun. Compared to our Sun's planets, there was a large gap between these "hot Jupiters" and our solar system planets.

Within the Kepler data there are 7 exoplanet candidates thought to be in the habitable zone of their star. However, none are confirmed to be for sure habitable. For example, Trappist 1 has 7 planets, but it is a crowded system with all the planets bunched up close to their star with orbits which would fit well inside the orbit of Mercury in our Solar System. And Trappist 1 is an M-dwarf star, which is active with UV and X-ray radiation. Kepler also found an exoplanet in orbit around a binary star of red and yellow colors just like Tatooine of Star Wars fame. Note: There is a Citizen Science opportunity to search the Kepler/TESS databases for exoplanets. If interested visit planethunters.org.

Unlike Kepler which stared at the same piece of sky for a several years, NASA's TESS Mission scans strips of sky with 4 smaller telescopes for a month at a time. Although not observing as deep as Kepler, TESS will cover the whole sky multiple times expecting to discover in excess of 20 thousand exoplanets. With this and Kepler's data, the void between the hot Jupiters and our solar system planets is beginning to be filled in. The surprise is there are lots of terrestrial planets larger than the Earth dubbed "super earths." Maybe our solar system is not as representative of planetary systems as has been thought.

Other proposed missions discussed included:

. NASA's 2.4 meter WFIRST mission to study dark energy and look for exoplanets via gravitational micro lensing.
. HabEx – Habitable Exoplanet Observatory, a concept to directly image earth like planets around sun-like stars.

EVAC Zoom Meeting Notes for 2020 July 17, at 07:30 P.M. AZ Time

by Wayne Thomas

Continued from page 4

. LUVOIR – Large UV/Optical/IR Surveyor, a concept for a multi wavelength space observatory.
. OST – NASA's Origins Space Telescope for Astrophysics, a concept proposal.

Dr. Christiansen responded to some questions as follows:

The smaller stars have zones and magnetic fields that never settle down. They have spots all the time making it difficult to detect planet transits.

For NASA it is costly to find life on nearby planets. Therefore the search begins with earth-like planets, not planets in general.

Hot Jupiters have sufficient mass to hold onto most of their atmosphere over the lifetime of their star, however earthlike planets having lower gravity will have their atmosphere stripped over time (photo evaporation) leaving a hot desert planet.

There are two competing theories of planet formation and migration – one suggests the early building blocks behave like billiard balls bouncing off one another. The other that the small bodies have dust and gas stick to them providing a torque on them slowing them down and changing their orbits. These two theories each produce inward migration and resonances.

The probability of earthlike planets orbiting a star in the Drake equation is unknown but may be between 20% and 50% based on the data so far.

One researcher has been looking in the Kepler data for exomoons for the past 12 years. So far he has only one candidate and no confirmation.

The Kepler mission took the safe approach by looking at Sun like stars. However, of the detected exoplanets, about 10% orbit K-dwarfs, and another 70% orbit M-dwarfs. Of the more than 2,000 candidate exoplanets identified by the TESS mission, only 55 have been confirmed to date.

The total attendance at this meeting was 71 (out of about 160 who were invited). To be added to the invite list, contact Tom Mozdzen at vp@evaconline.org. The meeting was adjourned by Gordon/Tom around 9:05 p.m.

Wayne Thomas, Secretary
EVAC

The Backard Astronomer

by Bill Dellinges (August 2020)

August Showcase Specimens

Yes, we who reside in the Valley of the Furnace should have been observing these objects after midnight during April and May when cooler temperatures prevailed. Save this tip for next spring! Meanwhile, either tough it out or head for higher elevations for more comfortable ranging of the summer skies.

Below I offer two or three objects in each of four categories: Open Star Clusters, Globular Star Clusters, Emission Nebulae and Planetary Nebulae. We begin with my favorite type of object, Open Star Clusters. **M7** in Scorpius is my go-to open cluster for summer. It's big and bright and can even be seen naked eye, looking like a small detached piece of Milky Way. In my opinion M7 is best seen in medium to large tripod mounted binoculars like a 16x70 or 20x100. The cluster is easy to find; the two stinger stars of Scorpius point directly east to M7. **M11**, the "Wild Duck Cluster" in Scutum is a fine, somewhat small cluster that is nevertheless quite charming. An unusually bright star near its center catches your eye. I use the two stars of Aquila's tail, Lambda and 12 Aquilae to point my way to M11 just across the border in Scutum. **NGC 6231**, near the bottom of the Scorpion's body, is often overlooked by stargazers. I think it's special because being so low in the sky, its colorful stars twinkle like crazy. Another thing going for it is a larger cluster to its northeast, Trumpler 24; when viewed together in binoculars, they look like a comet with a curved tail.

Globular Star Clusters: **M13** is arguably the finest example of a globular cluster for northern hemisphere observers. M13 is a spherical collection of perhaps a million stars 26,000 light years away. It fills a volume of space 160 light years in diameter. One has to wonder what the night sky must be like as seen from a planet revolving around one of its stars! M13 is easy to find as it's located 1/3 of the way from Eta to Zeta Herculis in the "Keystone" asterism of the constellation. **M22** in Sagittarius has to be runner-up to M13. Being only half the distance from us, M22 appears brighter and larger than M13. M22 also takes advantage of being located in the rich central region of the Milky Way allowing it to "borrow" some stars for visual impact. M22 would probably be more impressive than M13 if it wasn't so low in the sky where it suffers from atmospheric attenuation.

Emission Nebulae: Did you know there are only six emission nebulae in the Messier Catalog? Four are in the summer skies (M8, 16, 17 and 20) and two in the winter skies (M42 and 43). Two of the best are M8 and M17 in Sagittarius; both are active star-forming regions. **M8**, the Lagoon Nebula, is a gorgeous deep sky object. It's one of the brightest nebulae in the night sky and can actually be seen with the naked eye as a small nebulous knot above the Teapot's spout. A telescope reveals copious fluorescent gas clouds with a striking dark lane bifurcating the nebula northeast to southwest. For no extra charge there's an open star cluster, NGC 6530, embedded in the eastern side of the nebula. **M17** is a wonderful bright nebula shaped like a swan or duck floating on a pond (but upside down in SCT's and refractors with a diagonal). M17 is only two degrees above M24, the Sagittarius Star Cloud, and has several monikers including the Swan, Horseshoe, and Omega Nebula.

Planetary Nebulae: We now put our final three specimens under the microscope. These interesting objects are the ejected envelopes of stars following the last red giant stages of their lives (for stars under about eight solar masses). Their failed nuclear cores have collapsed into white dwarf stars that are still hot enough to excite the gaseous envelopes to shine. A planetary nebula can expand to be a light year or more in diameter. But in telescopes they're small and dim, requiring 100 to 200 power to see well with the exception of our first guest: **M27**, the Dumbbell Nebula in Vulpecula, is probably the most rewarding planetary for amateurs with modest sized telescopes. It's huge and bright enough to impress! Somewhat hard to find without a Go To telescope, it can be found in an 8x50x finder three degrees north of Gamma Sagittae, the Arrow, which is much easier to identify than Vulpecula! **M57**, the Ring Nebula in Lyra is likely every amateur's favorite planetary because of its classic donut appearance, or as a kid once told me, a Cheerio. M57, residing midway between Gamma and Beta Lyrae in the south end of Lyra's parallelogram is easy to find. **NGC 6826**, the Blinking Planetary in Cygnus is noted for its "blinking" behavior when using direct and averted vision. Its 8th magnitude central star is fairly easy see. NGC 6826 is stationed in the boondocks of Cygnus' west wingtip near Iota Cygni. Less than a degree to the west of NGC 6826 is the wide double star 16 Cygni (AB 6.0, 6.3, 39.5", G2V, G5V). Check it out – since our Sun is a spectral class G2V star, you'll be looking at two Sun-like stars.

Find Out What's Happening – Join EVAC-Announce List

If you would like to receive email announcements about EVAC meetings and activities, please join the EVAC–Announce mailing list. Click on the link below to subscribe. Enter your full email address in the box titled User Options and press OK. You will receive a confirmation email. Your privacy is respected by EVAC and we will never sell your email address, or use it for non-club relevant solicitations. This mailing list is designed for communication from EVAC, and does not enable users to respond to the message. If you wish to contact club officers, please use the list in the Contact-Us area on the Home page of our EVAC website. To subscribe to the EVAC–Announce mail group click: http://www.freelists.org/list/evac-announce. To unsubscribe use the same link, enter your email address and select Unsubscribe from the "Choose An Action" list. Another list to consder is AZ-Observing@groups.io, simply click on this link https://groups.io/g/AZ-Observing and follow the instructions on the page. EVAC also has a Facebook Group where members may share ideas, photos, and Astronomy related information. To join: EVAC Facebook Group.

The Gilbert Rotary Centennial Observatory (GRCO) also has a Facebook Group where members may share ideas, photos, and Astronomy related information. To visit, please click on Gilbert Rotary Centennial Observatory - GRCO.

Looking for that perfect weekend activity?

Why not resolve to getting involved?

Contact Claude Haynes to join the staff at GRCO

Email: grco@evaconline.org

EVAC Outreach Events

by Gordon Rosner

Again, unfortunately another very short column this month. All outreach events remain cancelled due to supporting the public health concerns. For more information, see the President's column at the beginning of this newsletter or at the top of the EVAC website.

As always, still looking very forward to our outreach program getting back and to hearing all those "OH WOW's" we so love to hear.

Gordon Rosner
EVAC Outreach Events Coordinator

Full Moon on August 3 at 08:59

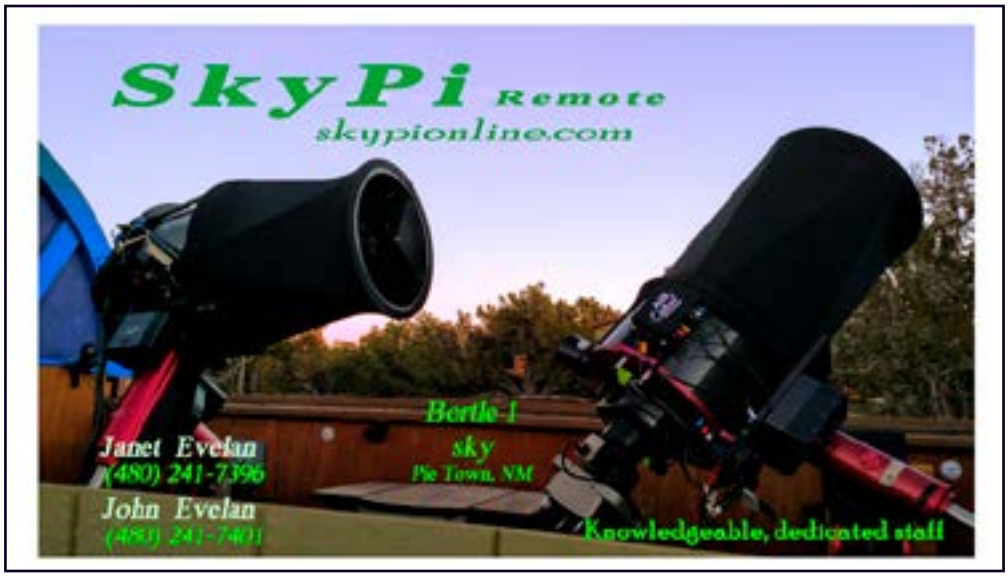
Last Quarter Moon on August 11 at 09:45

New Moon on August 18 at 19:42

First Quarter Moon on August 25 at 10:58

Classified Ads

Classified Ads



The darkest, most Pristine, sky in the continental U.S. !

At the site: Bathroom facilities, running water, 5 pads w110v, wifi, acres of grassy camp sites.

From the site: Very Large Array 42mi E, The Astronomical Lyceum 55mi E, MRO Observatory 80mi E

IC 405

Insight Observatory
16" ATEO 1 Telescope

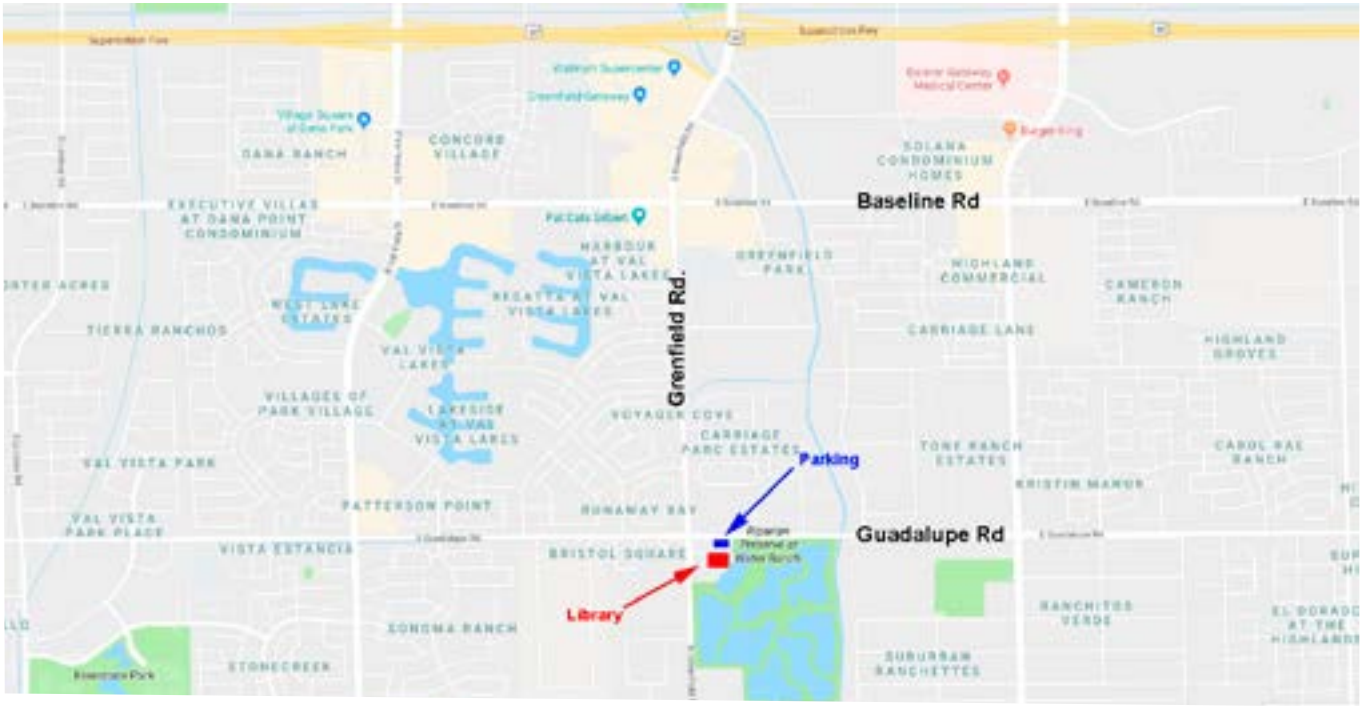
SkyPi Remote Observatory

Monthly Meetings will be presented live online using Zoom. See the EVAC Website for updates. All other events are on hold until health concerns are resolved.

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.

Visitors are always welcome!



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

August 2020

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

August 21 - EVAC Monthly Meeting Live

Online via Zoom

***The EVAC Monthly Meeting will be held live online via Zoom. All other meetings and events have been cancelled until further notice.**

September 2020

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		

September 18 - EVAC Monthly Meeting Live

Online via Zoom

***The EVAC Monthly Meeting will be held live online via Zoom. All other meetings and events have been cancelled until further notice.**

East Valley Astronomy Club -- 2020 Membership Form.

IMPORTANT: All memberships expire on December 31 of each year

New Member Dues (select according to the month you are joining the club)

	Individual	Family	
January, Feburary & March	**$30.00**	**$35.00**	
April, May & June	**$22.50**	**$26.25**	
July, August & September	**$15.00**	**$17.50**	
October, November & December	**$37.50**	**$43.75**	(*Includes following year)*

Renewal (current members only):

☐ **$30.00 Individual** ☐ **$35.00 Family**

☐ **Astronomical League:** $7.50 Annually (per person)

Name Badges: Quantity: _____

☐ **$10.00** Each

Name to imprint: _____

Total amount enclosed:

Please make check or money order payable to EVAC

Payment will be made using PayPal ☐

Name:

Phone:

Address:

Email:

City
State
Zip

URL
For website

Would you be interested in our outreach program? ☐ Yes ☐ No

How did you discover East Valley Astronomy Club?

Liability Release Form

In consideration of attending any publicized Star Party hosted by the East Valley Astronomy Club (hereinafter referred to as "EVAC"), the receipt and sufficiency of which is hereby acknowledged, I hereby affirm that I and any related entities, predecessors, successors, affiliates, attorneys, guarantors, insurers, transferees, assigns, parents, spouses, children, subsidiaries, accountants, officers, directors, employees, agents, shareholders, members, and trustees, past and present, hereby forever release, acquit and discharge to hold EVAC and its related entities, predecessors, successors, affiliates, attorneys, guarantors, insurers, transferees, assigns, parents, spouses, subsidiaries, accountants, officers, directors, employees, agents, shareholders, members, and trustees, past and present, from any and all causes of action, claims, losses, damages, liabilities, expenses (including attorneys' fees) and demands of any nature whatsoever, known or unknown, that in any way relate to, arise out of, or concern EVAC and/or my presence on the premises of any EVAC Star Party and related areas, whether or not those causes of action, claims, damages, liabilities, and demands are part of the specific subject matter of EVAC or any EVAC Star Party. This release is intended to and does cover all injuries and damages, and the consequences thereof, whether known or unknown at the time of the execution of this release, which have occurred or may hereafter occur or which may hereafter be discovered, and which may have been caused or may be claimed to have been caused by the said incident, and specifically includes, but is not limited to, bodily injuries, mental and emotional injury, pain and suffering, medical treatments, and loss of earnings or income.

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.

Signature _____ Date _____

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The East Valley Astronomy Club is a 501(c)(3) nonprofit charitable organization.

www.evaconline.org

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