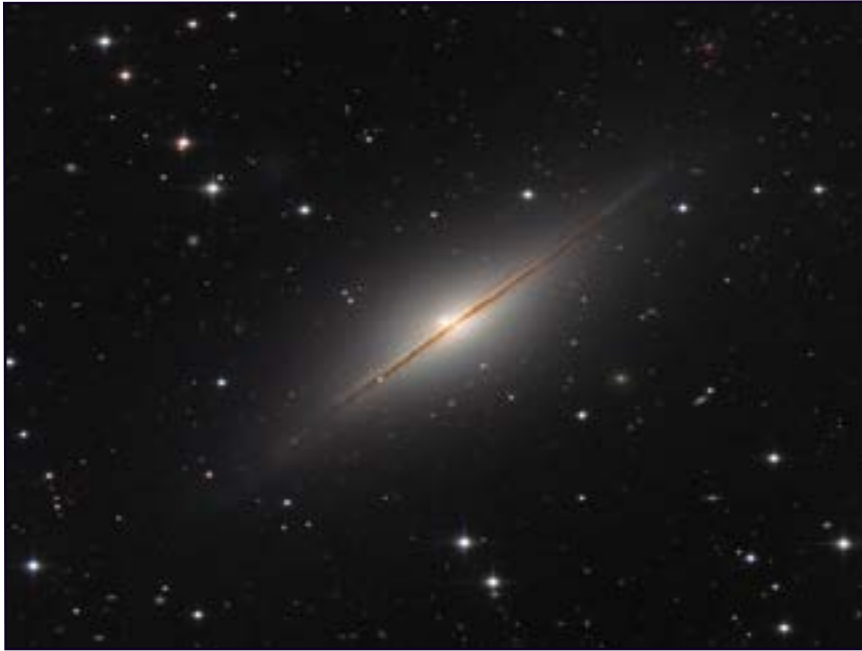
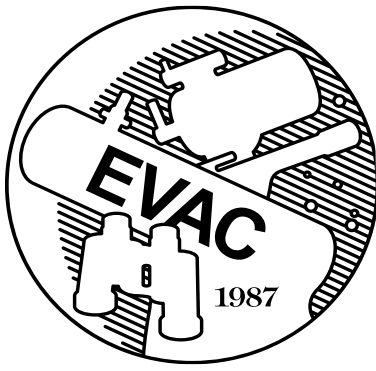


# THE OBSERVER

VOLUME 35 | ISSUE 9



NGC 7814 APOD July 22, 2021  
Image Credit & Copyright: [CHART32 Team](#)

## From the Desk of the President *by Gordon Rosner*

Greetings from your President.

As always, I sure hope everyone is well and keeping healthy during these changing and challenging times. Covid is continuing to haunt us and is preventing us from opening up our in-person events. We still don't know when we can return to those events. Keep updated via these newsletters and by visiting the club's website. However, our club's observatory, GRCO, currently remains operational to small private viewing requests Sunday through Thursday evenings. Scheduling is via the GRCO page on our website. It still remains closed to our normal

public viewing events on Friday and Saturday evenings.

It's September, there's an equinox coming up on the 22nd, and of course the event is called the "September Equinox". But, it is also known as the "Autumnal Equinox" or just the "Autumn Equinox". This is the time when there's an equal length of day and night as the Sun is directly above the Earth's equator, as it then appears to make its way south from us each day. This equinox marks the start of the autumn season for us astronomy types but historically marked the general separation of summer and winter, but

## UPCOMING EVENTS:

*All meetings will be held online.*

*EVAC Meeting via Zoom - September 17th.*

*Dr. Nathan Williams - "The Mars Helicopter "Ingenuity": First 6 Months on the Red Planet".*

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# From the Desk of the President

by Gordon Rosner

*Continued from page 1*

don't tell us that in Arizona. We still have a lot more summer to go.

Also this month, Neptune will be at opposition on 14 September. So, the farthest out planet (yeah, yeah, not counting Pluto) will be the closest it gets to Earth. Neptune is a very challenging planet to find in a backyard telescope. But this month it will be the easiest, or I should say the least difficult. See if you can find this tiny blue dot. And the birthstone for September is a sapphire. How appropriate this time around with sapphire being a blue gemstone. If you can find Neptune, maybe buy a sapphire in celebration to remember the day. Or, just have a blueberry muffin.

I mentioned in last month's newsletter that it's getting close to our 2022 club officer election process. Wow! 2022. How time flies when you're having fun! Well, the beginning of the process is now only one month away! The process is for nominations to be opened and accepted starting at the 15 October General Membership Meeting. That's next month! Nominations or volunteering of anyone who is interested in one of the positions will be to let one of the club officers know starting at the October meeting date and within a few days after. So, start thinking now about what position you are interested in. We need to know all of the candidates by a few days after the 15 October meeting so we can include them in the November newsletter. Voting on each position's candidate is by the club membership held during the November General Membership Meeting. All nine Board of Directors positions will be open for election. This includes President, Vice President, Treasurer, Secretary and all five Board of Directors at Large. Descriptions and duties of each position are in the club's Constitution and Bylaws via the Bylaws link at the bottom of our website's main page. Detailed descriptions of each position will also be included in the October newsletter. The operation of our club is now experienced in both pre-pandemic and pandemic operations. So the new officers have well established club operations for both situations and have the administrative tools available to lead in club growth. If you have any specific questions regarding the duties of a position, you can ask me directly at anytime via the President's link on our club's website. Being a part of the club's Leadership Team is a rewarding experience and honored activity in one of the country's premier astronomy clubs.

Remember that our Properties Director position remains open, and I encourage anyone interested to let me know via the President's link in our website. This position receives notices from private individuals and organizations of their offers to donate astronomy equipment to the club. This position evaluates the equipment which usually requires local travel, decides on its suitability, and if so, transports the equipment to the club's equipment shed. This is a great position to learn about and actually review different types of astronomy equipment. This equipment is subsequently either donated to schools or included in our club auctions to support our local astronomy community. The Properties Director is an appointed position with no term limit filled by a volunteer that does not require to be voted on by the general membership.

And again, as I also mention every month, everyone should remember that live member presentations are always a fun and valuable part of our monthly online Zoom meetings. An excellent example was seen by those viewing last month's online meeting. These are about ten minutes or so long regarding any astronomy related subject you would like to share with the club. I encourage you to do one of these. Just let me know if you would like to do one by using the 'Contact President' link near the bottom of the main page of our EVAC website. I'll then get back with you and we can discuss. If needed, we can also do a dry run sometime before the actual meeting.

Our next online Zoom Monthly General Meeting will be on Friday, 17 September starting at the usual 7:30PM. The main presentation will be by Dr. Nathan Williams NASA/JPL titled "The Mars Helicopter "Ingenuity": First 6 Months on the Red Planet".

As always every month, a reminder that there are three ways to receive a notification link via an email to register for the next online monthly General Meeting. Membership in the club is not needed as our meetings are open to all and we encourage all club friends to join our online meetings with us. You only need to do one of the following and only once to continue to receive the email on how to register for the upcoming meetings:

1. Send a one-time email request to [vp@evaonline.org](mailto:vp@evaonline.org).
2. Sign up for the [evac-announce@freelists.org](mailto:evac-announce@freelists.org) mailing list. Directions on how to do this and the link are included later

# From the Desk of the President

by Gordon Rosner

*Continued from page 2*

in the 'Find Out What's Happening' section of this newsletter.

3) Sign up for the [AZ-observing@groups.io](mailto:AZ-observing@groups.io) mailing list. Also here, directions on how to do this and the link are included later in the 'Find Out What's Happening' section of this newsletter.

A way to get notifications of any special online events and how to register, is to join the EVAC Facebook page and occasionally check for special event announcements. The link to join is provided in the 'Find Out What's Happening' section of this newsletter. These events will also be announced during our monthly General Meetings.

## EVAC Zoom Meeting Notes for 2021 August 20th, at 07:30 P.M. AZ Time by Wayne Thomas

Here are the Meeting minutes including details of the presentations. (The recorded video of the meeting can be viewed at: [EVAC Zoom Meeting 2021-08-20](#)).

President Gordon Rosner welcomed those in the "audience" to the virtual meeting shortly after 7:30 p.m. His first slide displayed the meeting agenda:

- Welcome
- Introductions
- Club News
- Officer Elections
- Member Presentation: Adriana Baniecki - "Stellar Distribution Across Different Galaxy Types".
- Main Presentation: Alan Friedman - "Minimum to the Max"

Gordon welcomed everyone in the virtual audience with his "Live Long and Prosper" slide. He then shared the slide listing the club officers. The appointed position of Property Manager is still vacant.

Under club news, he reminded us that all club sponsored events with personal contact are still cancelled with the exception of private star parties at GRCO. These consist of a few participants following guidelines for preventing the spread of the Corona Virus. A private meeting at GRCO can be requested using the schedule request form on the EVAC website.

Our next regular club meeting will again be a virtual Zoom meeting at 7:30 p.m. on Friday, September 17. Dr.

I'll 'see you' at our 17 September meeting. Remember we are accepting a one page or so article for our newsletters on any astronomy related topic from our members. Just send yours to me via the 'Contact President' link on our website.

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

Your President,  
Gordon Rosner

Nathan Williams, NASA/JPL will present "The Mars Helicopter 'Ingenuity': First 6 Months on the Red Planet." Register for the meeting in the usual way by the link in the invitation email.

Gordon next introduced Adriana Baniecki who presented her research with the University of Arizona Advanced Astronomy Camp which she attended virtually this past June. She and her team investigated what could be learned from comparing images of galaxies showing red and blue stars. These images were taken through red and blue filters to display these two colors of stars. They were to explore and draw conclusions about the age and behavior of each of six galaxy types. Her presentation is included in the recording of our meeting in the above referenced link.

Following her presentation, Adriana fielded the following questions:

1. Which optical and radio telescopes did you use? The images were taken with the 32 inch optical telescope.
2. Were the exposure times through the red and blue filters the same? The exposures varied between 2 and 10 minutes. However, for each galaxy the times were the same through both red and blue filters.
3. Were you able to make a B-R (B minus R) color plot? No, we did not have enough time. (Bob Buckheim volunteered to assist if FITS data were available.)
4. Blue stars are intrinsically brighter. How was this taken into account? The comparisons were qualitative. In the ellipticals the red images were a lot brighter.

# EVAC Zoom Meeting Notes for 2021 August 20th, at 07:30 P.M. AZ Time

by Wayne Thomas

*Continued from page 3*

5. Are you going to major in astronomy in college? No, I'll major in physics, but I'll keep up my astronomy hobby.
6. Were the densities of the red and blue filters the same? Adriana was not familiar with the term density.

Advanced Astronomy Camp is open to all ages. Apply at: <https://www.astronomycamp.org/register.html>

Tom Mozden then introduced the featured speaker, Alan Friedman who spoke on "Minimum to the Max."

Alan has done many types of astro imaging, but now primarily images the Sun. He calls his favorite solar imaging telescope "Little Big Man." This Astrophysics 92mm, f/4.8 APO fits easily into a suitcase which he can stow under his seat in an airplane.

Alan first encouraged all to use this solar minimum phase to hone our solar imaging skills. Even at solar minimum solar prominences on the solar limb are visible and can be imaged.

Alan discussed his various techniques to make images of the Sun attractive and new every day. As an artist he strives to be accurate and faithful the Sun, but also to provide interest, understanding and depth with his images of the chromosphere. One of the techniques he has developed is inversion which makes dark areas light (like sunspots) and bright areas dark (like the photosphere of the sun). Especially during solar minimum he likes to focus on prominences, his favorite imaging subject.

During solar eclipses, he likes to add a human element. To accomplish this he locates the positions both for his camera and for an earth bound subject so that the camera, subject and Sun lie in a straight line. He uses various tools to accomplish this including a planetarium program and Google Earth.

Alan shared many of the images he has created of solar eclipses, of sunspots and of prominences. He has received awards for some, been featured in Astronomy Picture of the Day, and has had his images featured in various publications.

The last portion of his presentation included walking us through his processing methods. After image capture which he does on a Mac, he uses Photoshop to process the data. From the video stream he selects the best ones and stacks them using several points for alignment. He often uses an occulting disk to block out the bright photosphere. He also lightens the background with a gradient. And he uses color. The more compelling the resulting image, the more looks it will receive and the more the image will travel.

Following his presentation, Alan fielded the following questions:

1. What will be the strength of the coming solar maximum? Some forecast that the coming max will not be very strong. Others disagree. The jury is still out on this one.
2. What is the best time of the morning for solar imaging? From Buffalo, New York, 9 a.m. is pretty good. By 10 a.m. there is some deterioration in the seeing. Before 9 am the vegetation around my home limits the sun's visibility.
3. What cameras do you use? With the Little Big Man, a Baader Flat Field Corrector yields an effective focal length of about 1700 mm. My cameras are all old Flir cameras (Point Grey Research) giving me 2 MP streaming at 30 frames per second and a 24 arcminute field at 72 BPI.

More information can be obtained by Googling his name.

Our next meeting will be on Friday, September 17, at 7:30 p.m. via Zoom. Dr. Nathan Williams, NASA/JPL will present on "The Mars Helicopter 'Ingenuity': First 6 Months on the Red Planet."

Gordon adjourned the meeting at 8:51 p.m. Attendance was at least 68.

Wayne Thomas, Secretary

EVAC

# The Backyard Astronomer

by Bill Dellings

## Summer Triangle...Still Around?

It always amazes me that the Summer Triangle asterism is still around in September – it's just now transiting high on the meridian. It could be argued that in the realm of asterisms, the Summer Triangle is the second most recognized star grouping after the Big Dipper asterism, which of course is the seven brightest stars in the constellation of Ursa Major. To my eye the Summer Triangle is not a perfect equilateral triangle, but more along the lines of a scalene triangle where no side lengths are the same lengths. But I'll take it. It's still a triangle!

To create the Summer Triangle, we must utilize the three brightest stars in Lyra the Lyre, Aquila the Eagle, and Cygnus the Swan. Respectively they are **Vega** (Arabic, the "Swooping Eagle/or vulture" [note: Lyra was an eagle in Arabic star lore]), **Altair** (Arabic, "the Flying Eagle/or vulture") and **Deneb** (Arabic, "the Hen's Tail") which form a conspicuous triangle about 24, 34 and 38 degrees in length per side. The three constellations are embedded in the northern regions of the Milky Way band between Sagittarius and Cepheus. Their Lucida's really stick out amongst the panoply of stars, especially if the night sky is slightly light polluted – which unfortunately, applies to most of us.

Let's take a closer look at their stars in order of brightness. First up is **Vega**, 25 light years away. At magnitude +0.03, it's the brightest of the threesome. Vega is the third brightest star seen from the northern hemisphere (after Sirius and Arcturus) and this month is only outshone these evenings by Arcturus low in the west, Jupiter and the moon. It's 2.5 times the mass of our Sun and 40 times more luminous. Its spectral class is A0 V giving it a surface temperature of 16,800°F (the Sun cooks along at 10,400° F). Because this class of star shines with a blue-white color, Vega is sometimes referred to as "the Sirius of Summer." It's a fast rotator, making one rotation in 12.4 hours, compared to our Sun's poky 25 days, giving it a distinct oblate shape – its diameter ranges from 2.75 Solar diameters at the equator to 2.25 at the poles. Considering its high rotational rate, it has been calculated Vega has reached 92% of its breakup speed. Precession will make Vega our North Star in 13,000 years, albeit 4.5 degrees from Earth's celestial north pole versus the current 0.73 degrees for Po-

laris. Movie buffs: In the 1997 sci-fi movie "Contact", Jodie Foster meets her "late father" on a planet around Vega.

Our second Summer Triangle star is **Altair**, a magnitude +0.76 star only 17 light years distant. Altair is another fast rotator like Vega, spinning once in 10 hours, even faster than Vega. It too is oblate with its equator 14% greater than its polar diameter. Altair's diameter is just under twice that of the Sun. Altair's spectral class is A7 V. It shines with the white light of a 13,000° F surface temperature, mass 1.8 that of the Sun and luminosity 10.6 times that of our humble Sun. Like Vega, Altair has a Hollywood connection. In the 1956 sci-fi movie "Forbidden Planet", a space crew from Earth is dispatched to a planet around Altair to investigate the disappearance of a previous mission.

**Deneb** is the third and faintest member of the Summer Triangle at magnitude +1.25. But don't feel sorry for it. It appears dim because it's much more distant than Vega and Altair. In reality it's a monster blowtorch of a star. Deneb is a spectral class A2 1a blue - white supergiant 200 times the diameter of the Sun. That just about fills Earth's orbit. Its distance is somewhat uncertain but thought to be in the range of 2,600 light years. Surface temperature is estimated at 14,700° F with a luminosity of 196,000 times that of the Sun. It puts out more energy in one second than the Sun does in 24 hours.

To appreciate the intrinsic power of Deneb, we can use the Absolute Magnitude scale by which we measure a star's brightness as if they were all at the same distance. Astronomers chose this distance to be 10 parsecs (32.6 light years). If we change the distance of Deneb from 2,600 to 32.6 light years, its magnitude increases to -8.38! (Vega and Altair's magnitude's decrease because their distances are being increased. Before/after: +0.03/+0.58, +0.76/+2.20 respectively).

### *Odds and ends:*

Within the confines of the Summer Triangle are a number of interesting deep sky objects. Here are a few top shelf items: Two of the finest planetary nebulae are located here - M57, the Ring Nebula in **Lyra** and M27, the Dumbbell Nebula in nearby Vulpecula, the Fox (which also harbors the unique Coathanger asterism, aka Collinder 399).

# The Backyard Astronomer

by Bill Dellings

*Continued from page 5*

**Cygnus** rents space to Albireo, a stunning blue and yellow “double star” (jury’s still out on whether it’s a true double star). Albireo is one of the five brightest stars of Cygnus that represent the popular “Northern Cross” asterism. It’s also the dimmest of the five at magnitude 3.1. I’ve always thought it would be nice if it was a magnitude brighter to enhance the appearance of the Cross, and also make it easier to find!

Before goto’s, I used the two tail stars in **Aquila**, Lambda and 12 Aquilae, as pointer stars to find M11, a fine open

star cluster (technically it’s just outside our summer Triangle in Scutum, the Shield). Altair is accompanied by two slightly fainter stars, Alshain and Tarazed, above and below it that just sets it apart from lonely Deneb and Vega. I remember their names, but not always which is which, so I created a mnemonic for them from south to north: Aquila attacks toads. You could go north to south reversing the order but that wouldn’t make much sense, would it? Toads attack Aquila? That would be silly.

## Imaging Targets for September

by James Yoder

In an effort to make planning what images to target for my astro-photography sessions more efficient, I have developed a Potential Targets Document ([September Example](#)) that I update each month on my website [www.Art-Centrics.com](http://www.Art-Centrics.com) located under the [Astronomy section](#). I also regularly post the link to the updated document on the [AZ-Observing Groups page](#). The document is broken up into four sections. **Section 1:**

- Summarizes Astronomical data for the date the new moon occurs for the month (New moon Date, Sunrise/set, Astronomical dusk/dawn)
- Describes my hardware setup, field of view and image scale.
- Explains how to use the document by describing what each field of a target in the object list means.

**Section 2** the Objects List is the bulk of the document and it lists objects roughly in order of Transit time. Items I have already imaged will be shaded gray. The following details are provided for each item:

- Common Name & Catalog number.
- Type of object (ie galaxy, Nebula, Globula, etc.).
- Constellation the object resides in.
- Coordinates based on how I would like to frame the object.
- Close bright star – useful for focusing on before imaging the target.
- Catalog object identifier – with Link to [Telescopius website](#) for quick more information (This is a great website for imaging planning).
- Imaging Window – Generally the timeframe the object will be above 45 degrees. Items with an \* may be under 45 degrees due to their location.

- Transit Time & Top Altitude of the object.
- Image Framing/Photo – How the object will be framed based on the identified configuration and coordinates. When this item has already been captured by me, a thumbnail of the actual photo is provided. If you click on the thumbnail, the full image will be displayed in your browser.

**Section 3** the Imaging Summary, is a quick table reference of objects grouped by configuration (ie Hyperstar, Focal Reducer, Primary Focus) based on a Celestron C-11 system. This is key for me planning my imaging sessions for the month (next session).

**Section 4** the Imaging Plan lists objects that I have identified as items I may want to target for imaging for the month. This helps me plan a session for the night based on what configuration I have setup on my scope. Obviously, this is customized for me, but could be a good template for others wanting to plan their own imaging sessions. Information included:

- Plan Number – Identifier for object.
- Class – Class of object, ie Broad Spectrum, or Nebula to help determine if filters may be needed.
- Type – Type of object (nebula, globular, galaxy, etc).
- Object – Catalog number for object.
- Imaging Window – Best timeframe for imaging an object.
- Transit – Transit time of object.
- Page Reference – Page in document where more details on the object is provided.
- Comments – Notes to myself for consideration on imaging the object.

# Imaging Targets for September

by James Yoder

*Continued from page 6*

The ArtCentrics Website has other topics, the most developed topics include [Hiking](#), [Money Matters](#) and [Astronomy](#). This website was designed for my personal use, as a location I can place information, and photos for myself, and share with friends and family. The Astronomy section has many sub-topics and could use a little better organization, but has some good information and references.

I regularly send out pictures to friends and family, these are restricted to Hiking and Astronomy, but mostly Hiking

since there are real limitations to how many Astro Photos one can take in a month. Generally I email photos about once a week or so (about how often I go out hiking – Example of last hike photos [here](#)). If you would be interested in getting on the distribution list feel free to email me at [jtyrep2020@ArtCentrics.com](mailto:jtyrep2020@ArtCentrics.com) Please Include Photo distribution list in the subject.

## 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

## 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 consider 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](#).

**NEW MOON ON SEPTEMBER 6 AT 17:51**

**FIRST QUARTER MOON ON SEPTEMBER 13 AT 13:39**

**FULL MOON ON SEPTEMBER 20 AT 16:54**

**LAST QUARTER MOON ON SEPTEMBER 28 AT 18:57**



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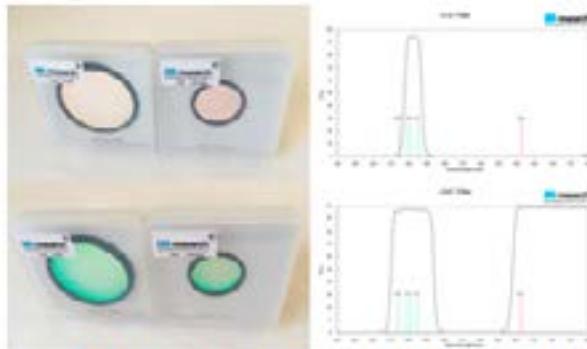
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Monthly Meetings will be presented live online using Zoom. See the EVAC Website for updates. All other events are on hold until health concerns are resolved.

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 normal in-person monthly meetings have temporarily been cancelled, and are replaced with an online Zoom meeting.**

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**



## SEPTEMBER 2021

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

**September 17** - 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.**

## OCTOBER 2021

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

**October 17** - 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 – 2021 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)

	<b>Individual</b>	<b>Family</b>	
January, February & March	<b>\$30.00</b>	<b>\$35.00</b>	
April, May & June	<b>\$22.50</b>	<b>\$26.25</b>	
July, August & September	<b>\$15.00</b>	<b>\$17.50</b>	
October, November & December	<b>\$37.50</b>	<b>\$43.75</b>	<i>(Includes following year)</i>

**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: <input style="width: 90%;" type="text"/>	Phone: <input style="width: 90%;" type="text"/>
Address: <input style="width: 90%;" type="text"/>	Email: <input style="width: 90%;" type="text"/>
City State Zip <input style="width: 90%;" type="text"/>	URL For website <input style="width: 90%;" type="text"/>

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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