Volume 35 Issue 2

February 2021

The Observer

NGC 2362 - The Tau Canis Majoris Cluster
Image Credit: Adam Block/Mount Lemmon Sky Center

Upcoming Events:

All meetings will be held online.

EVAC Meeting via Zoom - February 19th

Gerald van Belle - "Lowell Observatory Present Research Capabilities and Future Plans".

Inside this Issue:

From the Desk of the President
by Gordon Rosner

Greetings from your President.

As always, I sure hope everyone is still doing well and keeping healthy. Please remain vigilant into this new year as we all have hopes that things will get much better later this year and allow us to get back to in-person events. That sure is our hope. But, remember that all EVAC in-person group activities still remain cancelled. As always, check our club website for the latest information.

As a reminder, 2021 club dues are now due. Many members have already renewed. This is an example of the hopes for this year being much better by all those supporting our club to getting back to better times. Club members are the most important part of our club. This is YOU. By renewing your membership or joining as a new member, you become a part of a premier astronomy club and keep it strong. Go to our club website on the JOIN page and renew or join online or by mail.

Our Facebook page remains a growing showcase for both our fledgling astrophotographers and those seasoned artists whose level are the dreams of those just learning. Please take a look in there. Full of great stuff, good ideas and not

From the Desk of the President

by Gordon Rosner

Continued from page 1

just on astrophotography. It's certainly a vehicle to get together without being together.

On 22 January, the club had a Board of Directors meeting to discuss club directions and actions for 2021. The club's financial status was reviewed and reminded us that the club is still in sound financial status and all bills and operating expenses are still covered through the year. The club owes thanks to everyone who is a club member and keeps up with their dues. A major discussion was ideas for finding a replacement for our Hovatter Airfield dark sky site that we used for the All Arizona Star Parties and Messier Marathons. As you recall, the BLM airfield site was sold to LaPaz County for construction of a large solar energy site. Possible replacement sites were discussed and actions assigned supporting the search. Another subject was our "Protostar" program that was just about to start when all club activities were cancelled. This program was aimed at beginner astronomy subjects like beginning astrophotography and general astronomy subjects. The club Leadership Team still plans on implementing these but must wait until in-person events resume. If you have any subjects you would like to see in this program, please let me know by sending me your thoughts via the "Contact President' link at the bottom of the main page of our website.

During our January online General Meeting I mentioned a series of online presentations available to us titled "Introduction to Amateur Astronomy". This series is presented by the Kalamazoo Astronomical Society in Michigan and uses the online Zoom format just as our meetings do. The first presentation was on 23 January titled "Our Place Among the Infinities". I watched it and was very impressed by that two-hour presentation. Very well done with excellent graphics and a very knowledgeable live presenter. I highly recommend that you watch this series. Although targeting basics, it is also great as a review for those experienced club members. This series runs for five events with each event every other week on Saturday mornings 11:00AM to 1:00PM AZ time. The next presentation is on 6 February titled "Discovering the Night Sky". Other sessions deal with subjects like binoculars, telescopes, and astrophotography. You must register for these by going to their website at kasonline.org and can get more information there. They will then send you the link.

Lowell Observatory is putting on an event called the virtual "I Heart Pluto Festival 2021" celebrating Pluto's discovery on 18 February 91 years ago. This is an online event spanning 13-18 February. Anyone will be able to watch live stream YouTube presentations by visiting iheartpluto.org to see the times and titles of the presentations with links to watch them when the time comes. The online events are in the early evenings, AZ time. No registration is required.

Everyone should remember that member presentations are always a fun and valuable part of our monthly meetings. These are about ten minutes 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 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.

And if you would rather write than speak, our monthly newsletter could always use short one page or more article on any astronomy related topic. Tell us about your equipment, how you got started in astronomy, your road to astrophotography, outreach programs you have done, any observatories you have visited or any other astronomy related subject. If it was interesting to you, it will be interesting to all of us. So, become a published astronomer and submit an article to me via the 'Contact President' link on our website!

Our next online Monthly General Meeting will be on Friday, 19 February starting at 7:30PM. The main presentation will be by Lowell Observatory's Gerard van Belle on "Present Research Capabilities and Future Plans". Many of us have visited Lowell Observatory in Flagstaff and I imagine in the future most of us will either visit it again or visit it for the first time. Seeing this presentation will certainly provide incentive for visits. Don't miss this one.

As a reminder, there are three ways to receive a notification link via an email to register for the next online monthly General Meeting. 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:

From the Desk of the President
by Gordon Rosner

Continued from page 2

1) Send a one-time email request to vp@evaconline.org
2) Sign up for the evac-announce@freelists.org mailing list
3) Sign up for the AZ-observing@groups.io mailing list

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. These will also be announced during our monthly General Meetings.

I'll 'see you' at our 19 February meeting.

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

Gordon Rosner
President

EVAC Zoom Meeting Notes for 2021 January 15th, at 07:30 P.M. AZ Time
by Wayne Thomas

Meeting Minutes.

President Gordon Rosner welcomed those in the "audience" to the virtual meeting at 7:33 p.m. Peak attendance was 84. His first slide presented the meeting agenda:

- Welcome
- Introductions
- Dues are Due
- Club News
- Member presentation: Tom Polakis: "Jupiter & Saturn Conjunction"
- Featured Speaker: Dr. Travis A. Rector: "Color Composite Images by Professional Observatories"
- After his welcome, Gordon introduced the leadership team in charge of keeping EVAC running.

Club dues are due. Individual membership is $30, and family membership is $35. You may renew either online at "evaconline.org" or by mail. The mailing address is on our website with the membership form.

Under club news, he reminded us that all club sponsored events with personal contact are still cancelled. Member presentations are always welcome. A presentation can be made on any aspect of astronomy the member is interested in. Send Gordon a note if you are interested in making one. Our monthly meetings on Zoom are being recorded and each can be viewed from its link on the EVAC website.

Our next regular club meeting will be at 7:30 p.m. Friday February 19 via Zoom. Gerard van Belle of Lowell Observatory will present "Present Research Capabilities & Future Plans." Register for the meeting in the usual way by the link in the invitation email.

Gordon introduced Tom Polakis who shared images of Jupiter and Saturn as they danced to a very close conjunction on December 21. In the sky, Jupiter and Saturn appear to come close to each other once every 20 years. However, due to the inclination of their orbits, the two planets typically are only as close as one or two degrees separating them. This past December they were separated by only one tenth of a degree.

Tom started observing the pair several weeks prior to the conjunction and was thrilled as they approached each other. He showed a simulation of their approach showing the relative motion of Jupiter compared to a fixed Saturn. His image on December 20 showed the Great Red Spot on Jupiter's meridian. On December 21, the satellite Ganymede was visible in front of the disc of Jupiter, and Io and Europa were also visible in the image.

Tom also gave the numbers associated with his setup which included the QHY 462C one-shot color camera.

The challenge of imaging the conjunction included a bright sky with the sun only 9º below the horizon, and the planets only 15º above the horizon.

Tom Mozdzen then introduced the featured speaker, Dr. Travis Rector, Professor of Astrophysics at the University of Alaska Anchorage speaking on "Color Composite Images by Professional Observatories."

Travis introduced himself with two of his more popular images – one of the Eagle Nebula, the other of the Helix Nebula. As a post-doc at Kitt Peak, he imaged with the newly online Mosaic Camera on the 0.9 meter WIYN

EVAC Zoom Meeting Notes for 2021 December 18, at 07:30 P.M. AZ Time

by Wayne Thomas

Continued from page 3

telescope. The camera consists of 8 - 2K x 4K chips generating 300 MB per exposure. For publicity he superposed an image of the Moon over a star field of 1 square degree with the Moon occupying only half of the field.

The big question is: "Why do astronomers use professional observatories to make images?" One reason is the image represents the observatory, the science and the scientist. Another is the image can demonstrate new technology. Finally the image can be shared with other scientists and with the public. A recent example is the press release of the NOIRLAB DESI survey color composite.

As an aside, Travis shared a lesson learned: Do it once, it is a favor. Do it twice, it's your job. He is now requested to take images for several professional observatories in many countries.

When asked if the images are real, the answer is yes. However, when asked if it would look like this if I were to stand next to it, the answer is no. The reason is deep space objects typically have low surface brightness which requires long exposures to make the light visible in the image.

The challenge of representing the colors of an object in an image is an interesting subject. There are no hard and fast rules. However, color can be used to provide depth to an image. Astronomy imagers have learned what artists have known for a long time. More distant objects appear bluer than closer objects. This fact can be used to provide depth to deep space subjects. Another guide is the chromatic order which is that in the visible spectrum, more energetic colors (shorter wavelength) are bluer, and less energetic colors (longer wavelengths) are redder. This can be applied to other portions of the electromagnetic spectrum in addition to the visible. However, when it comes to narrow band filters, there are no rules.

Another use of color is to highlight details of an image which might not stand out in a black and white image. The example shown was of a nebula with stars forming within it. Young stellar objects create shock waves which are visible as Herbig-Harrow objects. By creating a color image, these objects become much more visible.

To view some of the images created by Travis and others, go to the NOIRLab website and view their image gallery.

Q&A:

Alex asked about the software used to process the data. The software is mostly unique to each telescope. The files created are in FITs format, and may be processed by IRAF (a user hostile program). Or the FITs files may be processed with FITs liberator creating a 16 bit grey scale TIF file which can then be processed in Photoshop. (IRAF is being replaced by Python programs.)

Why is the color green not more apparent in astronomy images? Green and Yellow tend to overpower an image, since our eyes are most sensitive to these colors.

Steven asked what professional astronomers would like amateurs to do more of. While professional observatories have more aperture, amateurs have more time. Typical amateur equipment with f-ratios of 6 to 8, are not that much different from professional f-ratios of 2 to 3. Professional observatories are good at faint and compact objects. While amateurs can take really deep exposures of large extended objects which often is quite valuable.

Kevin asked what is the correct color for an image.
Follow the rules of visual grammar. Keep your colors in chromatic order – longer wavelengths redder and shorter wavelengths bluer. However, for narrow band filters, there are no rules.

Bill asked how professional observatories handle satellite trails. The professionals take multiple images and select the best ones (with no trails). However, the LSST will have a very large field of view, and data reduction will be automated. Satellite trails will be a problem.

Tom asked if Travis still travels.
Some observatories can be operated remotely, but he still must travel to Kitt Peak when he has time there.

Our next meeting will be on Friday January 15th, at 7:30 p.m. via Zoom.

Gordon adjourned the meeting at 8:57 p.m.

Wayne Thomas
Secretary EVAC

The Backyard Astronomer

by Bill Dellinges (Reprint: February 2015)

Winter DSO Overload

Yikes! Where to begin? So many Deep Sky Objects and so little time. The Winter Hexagon offers a plethora of star clusters, nebulae and double stars but not too many galaxies of any consequence due to the winter Milky Way blocking the view of those "Island Universes." Let's point out highlights offered by what I call the Big Five: Orion, Gemini, Canis Major, Taurus, and Auriga.

Orion: The crown jewel of winter skies must be M42, the Orion Nebula. It's probably the best example of an emission nebula seen from the northern hemisphere. M42 looks intriguing in any telescope. Even the naked eye can see that the middle star in the sword is nebulous. Look for the tight knot of four stars at the heart of nebula - the Trapezium. They are responsible for stimulating the nebula to shine. If seeing permits, increase the magnification and look for the fifth and sixth E and F components of the Trapezium. They are dimmer than the main four stars. The E component is fairly easy to pick out, but the F star requires good seeing. Look for mottling in the ethereal tendrils of the nebula's gas clouds. Try observing in the entire Sword in binoculars, for the view reveals the three stars, seen by the naked eye, are actually three separate complexes comprised of M42 and two loose open star clusters, one above and below the nebula. It's a scene to take one's breath away. There is an unusual star cluster located where Orion's right elbow would be. NGC 2169 resembles the number 37 and is sometimes called the 37 Cluster. Telescopes with reverse images will show the 37 backwards, but it's still fun to see. The Head of Orion is often overlooked. A wide field telescope or binocular will show the several stars to be the sparse open star cluster, Collinder 69. Orion contains many double stars, two of which beg for your attention. Rigel at magnitude 0.3 is the brightest star in Orion and has a 6.8 companion 9.8" (arc seconds) away. Almost any telescope should split it at about 100x, but Rigel's brightness can make resolving its companion difficult if the seeing is bad. Fourth magnitude Sigma Orionis is just below Alnitak, the eastern most Belt star. It is not to be missed. It's a quadruple star arranged nearly in a straight line reminiscent of Jupiter and three of its moons. It might take 100x to separate the magnitude 10.3 C component from the brighter 3.8 magnitude A star. In the same field, for no extra charge, you should also see the triple star Struve 761 north of Sigma.

Gemini: NGC 2392, the Eskimo Nebula, is one of the best planetary nebula in the sky and can be found two degrees southeast of Wasat (Delta Gem.). It has a tenth magnitude central star that's easy to resolve in a modest backyard telescope. An OIII filter enhances the nebula but causes the central star to disappear. Because most planetary nebulae have small angular diameters, high powers of 100x and up are required to see these celestial ghosts well. Castor is Gemini's second brightest after Pollux and a beautiful close double star. The stars are magnitude 1.9 and 2.9 with a separation of 3.8" and should easily be resolvable at 100x. Though mainly appreciated as a double, there is a third 9.8 magnitude star 71 arc seconds away at position angle (PA) 164 degrees. Can you find it? All three stars are spectroscopic doubles, thus it's a six star system. M35 near Castor's "foot" is a stunningly beautiful open star cluster. They don't get much better than this specimen. For a challenge, try to spot the more remote NGC 2158, a small faint cluster about half a degree southwest of M35. At first you'll think you've discovered a comet. But 200x will reveal its stellar nature and you'll calm down.

Canis Major: Home of the night sky's brightest star, Sirius (-1.44). Less than four degrees due south of this blazing beacon resides M41, another fine open star cluster. It's a tad large at 40' (arc minutes) so use low power. Somewhat off the beaten path, four degrees northeast of Wezen (Delta C. Maj.), is an interesting star cluster not to be missed. NGC 2362 is a cute little star cluster set apart by being a host to Tau Canis Majoris, a blue magnitude 4.4 supergiant and triple star. Surprisingly, it's not difficult to find Tau's companions amongst the background stars of the cluster. The 11th magnitude stars share a similar PA, 80 and 90 degrees. Separation is 8.2" and 14.5".

Taurus: How can you not shout out PLEIADES ("Glitter like a swarm of fireflies tangled in a silver braid", Tennyson) when thinking Taurus? What other star cluster is so close to us, 378 lights years, that you can resolve it with the naked eye? OK, the Face of the Bull, the Hyades, is also a star cluster only 120 light years away and also resolvable without optical aid. While both are beauties in their own right, the Pleiades is a more compact grouping and steal the show from the Hyades. To appreciate them at their best, use a midsized tripod mounted binocular like a 10x70 or 20x80 on the Pleiades and a 7x50 on the Hyades. M1, the Crab Nebula, gets a lot of press but is disappointing visually in telescopes under 12" of aperture. Stephen O'Meara

The Backyard Astronomer

Continued from page 5

recommends NGC 1807/17 as two star clusters that can fit in a one degree field. They were quite unique at 90x in my 11" with its 0.9 degree field of view.

Auriga: As I pointed out in last month's column, the showcase objects in Auriga are M36, 37, 38, three pretty open star clusters fairly close to one another, each with its own personality. Give them a try and pick one as your favorite! These are just a few of the more popular targets in winter's Big Five constellations. After checking them out, consider going after their other heavenly assets.

EVAC Outreach Events

by Gordon Rosner

Again, unfortunately another very short column this month. All outreach events remain can-celled 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

Last Quarter Moon on February 4 at 10:37

New Moon on February 11 at 12:06

First Quarter Moon on February 19 at 11:47

Full Moon on February 27 at 01:17

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

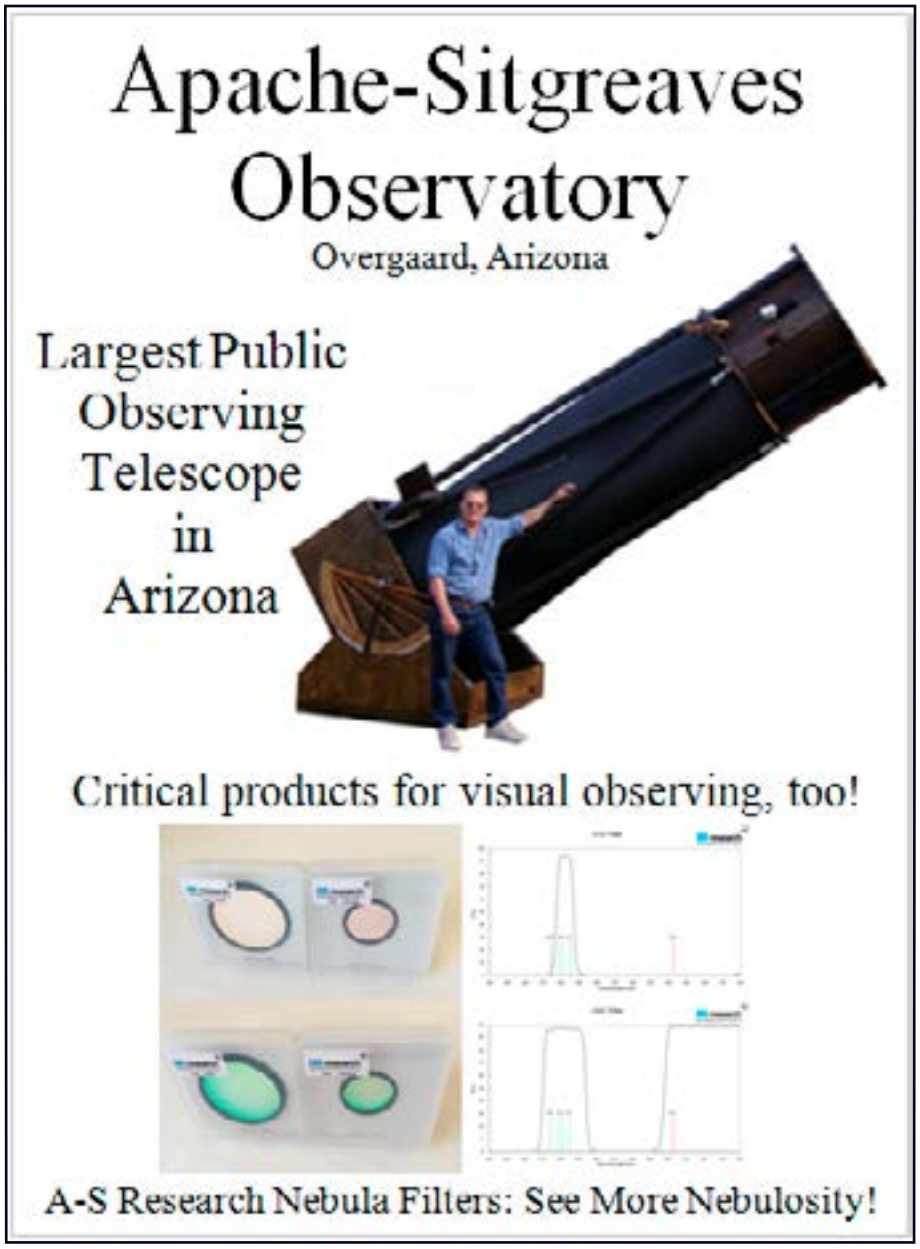
Email: grco@evaconline.org

SkyPi Remote Observatory

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



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

February 2021

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						

Febuary 19 - 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.

March 2021

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						

March 19 - 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)

	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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