

# THE OBSERVER



NGC 4302 and NGC 4298  
Image Credit: NASA, M. Mutchler

## From the Desk of the President by Claude Haynes

Happy Vernal Equinox – it's SPRING. From a Disney cartoon with Goofy as lecturer: "Spring, when a young man's thoughts turn toward our national pastime – again, others think of baseball". Astronomers think of Messier, and it is great that Saguaro Astronomy Club hosted the Messier Marathon this year. Hopefully clouds are forgiving, and we can catch up on observing before the summer heat and storms.

I want to again thank all of you who participated in our recent survey. We received a lot of great information and feedback. The board meets monthly and your responses

will help drive future opportunities. One of the best results is the number of new volunteers for GRACO and outreach events. If you are interested in volunteering but didn't provide an email address, send a message to [president@evaonline.org](mailto:president@evaonline.org) and we can add you to our active lists.

While we haven't resumed monthly in person meetings, the board did authorize our events coordinator, Alex Nachman, to begin accepting star party requests. Given that the sun is setting close to 7pm now we may not have a lot of school reservations, but some outreach oppor-

## UPCOMING EVENTS:

*All meetings will be held online.*

*EVAC Meeting via Zoom - April 15th.*

*Jenny Patience - Exoplanets.*

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# From the Desk of the President

*by Claude Haynes*

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tunities may arise. We are also considering returning to Friday public viewing at GRCO in the near future.

Our next meeting is Friday, April 15 at 7:30pm and will be via ZOOM. Our speaker is Jenny Patience discussing Exoplanets. We have discovered over 5,000 planets around stars other than our Sun. It should be a really informative talk. Don't forget that past meetings are available to view

on the EVAC website under Meetings & Events. Enjoy spring – so long Orion; welcome Virgo and Corvus. As Andromeda sets, we welcome the Sombrero. Let the fiesta begin.

Your President  
Claude Haynes

## EVAC Zoom Meeting Notes for 2022 March 18th, at 07:30 P.M. AZ Time

*by Club Secretary Gordon Rosner*

Greetings from your club Secretary.

First, the standard monthly stuff for you first time readers. For those who are regular readers, you can fast forward to the next paragraph. The following are my notes from our 18 March online General Membership Meeting. All our monthly meetings are recorded and are available to watch via links in our club's website. If you missed this meeting, or want to watch again, you can watch the recording online. My notes published here are only a summary. I will not attempt to provide details in fear of misquoting or mixing up some data presented. Hopefully I will provide just enough to spark a drive for our members, or potential members, to watch the recording and cut out the middleman... me.

The meeting started at 7:30PM with our club President, Claude Haynes, welcoming our viewers and again giving a quick update on the James Webb Space Telescope. He showed the latest image from the JWST showing the telescope mirrors' alignment process is still going well. Amazingly well! He then introduced our club's officers and mentioned that the Vice President position is still open. Anyone interested was encouraged to let him know. Claude then gave an informative explanation of the Zoom screen viewing options that the audience can use to better control how they can see presentations.

Claude then presented the results of the 80 responses received from the EVAC Survey. Each question's response was presented in either pie chart or bar chart format to easily see the response distribution. The questions pertained to when the club should return to in person meetings, providing more online offerings, interest in volunteer opportunities, and more to get input into the club's

general thoughts on the near future. Lots of good stuff in there. So, if you were not a part of the meeting live audience, I encourage you to watch the meeting recording available on the club website.

Claude talked about the club's latest Board of Directors' meeting who concluded that April's General Membership Meeting will remain online via Zoom and that the BoD meets monthly to decide if we should return to in person meetings. He also stated we have returned to supporting some requests for outreach Star Parties. However, these will be on a case-by-case decision by our Outreach Administrator to ensure the safety of EVAC outreach volunteers and the outreach audience. Location and size of the event will be considered. Our outreach events usually support school science activities. He also added that anyone wanting to volunteer for club activities who did not provide contact information in the survey, to let him know directly via the President's link in the club's website.

Claude told the audience that this year's Messier Marathon will be held on Saturday 26 March at the Antenna Site close to the Hovatter airfield where it used to be held. He showed a map. The event is hosted by the Saguaro Astronomy Club. He also talked about other upcoming astronomy events such as ASU's Marston Exploration Theater and the Origins Project Foundation at the Orpheum Theater.

Tom Mozdzen then introduced ASU Professor Dr. Phil Mauskopf as our main speaker. His talk was titled 'Interplanetary and Interstellar Communication and Navigation - How to Reach the Nearest Star'. It centered on the Stephen Hawking originally proposed Breakthrough Starshot program that would develop and launch an inter-

# EVAC Zoom Meeting Notes for 2022 March 18th, at 07:30 P.M. AZ Time

by Gordon Rosner

*Continued from page 2*

stellar probe. This fascinating presentation included the challenges and possible solutions to designing, building, navigating, communicating and methods of propulsion of such a probe. What seemed like science fiction of a postage stamp size one gram probe being accelerated to 0.2 the speed of light targeting the Alpha Centauri System was supported with current science facts and engineering methods with a few plausible theories also being investigated. The possible approaches were listed with the most feasible being discussed in detail. Can you imagine the challenges involved with a probe going 0.2 the speed of light passing by a planet while collecting data and sending it back to Earth? How can the probe navigate? Is using the Cosmic Microwave Background work as a kind of map possible? What about relativistic effects of traveling at such a speed? This is exactly the intriguing stuff Dr. Phil Mauskopf presented. Phil then answered questions keeping in mind that this is a difficult vision with lots of questions still being worked on by many people. Although imagination is limitless, it must be applied within the physical laws of the universe.

Phil presented such problem solving possibilities with such understandable detail that I can not do any justice by attempting to summarize it all here. If you did not attend the meeting and see this presentation live, you must watch the recording included in our club's website. This presentation was certainly unique as it presented how scientists and engineers are actually working on a seemingly impossible mission. 'Impossible'? After watching this presentation, you will most likely say 'Probable'. Remember back not so long ago when people thought sending anyone to the Moon and returning them was just too complicated and impossible?

Claude thanked those 65 attending and thanked Phil for his unique and certainly interesting presentation. He reminded everyone that the next Zoom meeting is 15 April starting at the usual 7:30PM. He then closed the meeting at 9:03PM.

Gordon Rosner  
EVAC Secretary

## The Backyard Astronomer

by Bill Dellenges

### Astro-Potpourri (4/16)

Potpourri? Literally French for "rotten pot"? Well, let's hope not. I keep a record of miscellaneous factoids relating to astronomy. Don't ask me why, I can't help myself. I would like to share a few of these revelations with you. Gemini is high overhead these evenings. Did you know two planets were discovered amongst the Twins? In 1781 William Herschel discovered Uranus not far from Eta Gemini, just below the open star cluster M-35. As a sidebar, there are reports that Uranus had been seen earlier by Hipparchus in 128 B.C., John Flamsteed in 1725, James Bradley in 1729 and Pierre Lemonnier in 1750. This is not surprising as Uranus' mean magnitude is 5.6, within naked eye visibility. The former planet Pluto was discovered near Delta Gemini (Wasat) in 1930 by Clyde Tombaugh at Lowell Observatory. NGC 2392 is nearby. What about Neptune, where was this ice giant found? Way over in Capricornus near Mu Capricorni in 1846 by German astronomer J. G. Galle. He used mathematical predictions of Frenchman Urbain Leverrier and Englishman John Couch Adams (derived independently) to locate a planet disturbing the orbit of Uranus. Neptune had also been

seen earlier and recorded by Galileo in 1612 and 1613 and Joseph-Jerome de Lalande in 1795. The latter created the now defunct constellation Felis the Cat because, he said, "I am very fond of cats."

Plugging numbers into the Schwarzschild Radius of black holes (BH), Earth would qualify as a BH when reduced to a diameter of about one inch. Jupiter becomes a BH at a diameter of twenty feet. Though the Sun is not a massive enough star to collapse down to a BH under normal circumstances, in theory if somehow you could squeeze it down to a diameter of 3.7 miles, bingo, you'd have a BH. Stars more massive than the Sun can produce a single BH. Or when many stars merge, a super massive BH can form. Astronomers believe most galaxies harbor these monsters at their center. Astronomers tell us our own Milky Way has a 4 million solar mass BH at its center (one solar mass = one sun's worth of material). The giant elliptical galaxy M-87 in Virgo is home to a 6.4 billion solar mass BH. Top prize so far for the most massive super massive BH goes to NGC 4889 in Coma Berenices – 21 billion solar masses.

# The Backyard Astronomer

by Bill Dellinges

*Continued from page 3*

**Barycenters:** Where is the center of mass between the Earth and Moon? About 1,061 miles below the surface of the Earth. For the Earth - Sun system, their barycenter is located about 280 miles from the center of the Sun. The barycenter for the Sun and Jupiter resides some 30,000 miles above the Sun's surface.

The Sun will end its life as a white dwarf in about 5 billion years. The Earth-sized object will be the highly compressed spent carbon-oxygen core of the Sun shining white hot by compression alone, no longer utilizing nuclear reactions. A teaspoon of its material would weigh one ton on Earth. The dead star will eventually cool off to a black dwarf. It's thought that will take 50 billion years. Since the universe is only about 13 billion years old, no white dwarf has had enough time to become a black dwarf. Stars more massive than the Sun end their lives as either a neutron star or black hole. Their larger progenitor crushes the star's core down to about a 10 mile diameter object converting whatever elements remained into neutrons. A teaspoon of neutron material would weight 100 million tons on earth. These stars spin rapidly due to the conservation of angular momentum. If the release

of intense energy from their magnetic pole sweeps past Earth, they are called pulsars. The Crab Nebula's pulsar star spins 30 times a second. The fastest known pulsar discovered so far is PSR J174-2246ad which rotates 700 times a second. Its equator is moving at 24% the speed of light.

The fastest speed most people experience on Earth is 600 miles an hour on a jet airliner. At that speed you can circle Earth in 42 hours (bring snacks). Traveling at airliner speed, it would take you 18 years to reach the Sun (best to go at night). This same speed gets you to the next nearest star, Alpha Centauri, in 4.8 million years - not too practical. Let's bump that speed up to 30,000 miles an hour, typical of current spacecraft velocities. You've now reduced your travel time to 96,122 years. By the way, you're only allowed two pieces of luggage.

It's been fun sharing these tidbits with you. There are more where these came as I'm a hoarder for astronomical trivia, but we must stop somewhere. Until I move some dusty storage boxes around for a future astro-potpourri, I wish you dark skies. Now where did I put my glasses?

## EVAC Outreach Events

by Alexandra Nachman

Hey there! I am Alexandra Nachman, the new Outreach Events Coordinator for EVAC! I am very excited to work with the public and get to do awesome events when we begin doing them again! I have been a NASA Solar System Ambassador for NASA JPL since January 2020 and have been doing outreach events ever since! I now have 50 events under my belt and I enjoy doing them so much!

I cannot wait to see what this year brings! I hope to bring my own experience to it and offer a range of fun things to do for events in addition to telescope viewings. I love developing new activities for astronomy to make it fun. I also quite enjoy image processing using professional data, like

that from the Hubble Space Telescope and other observatories. It definitely helps to have amazing images with the presentations! This year is going to be amazing and I hope that when we begin doing outreach activities again that you will join me in sharing the amazing Universe with those who seek to learn! Anyone can volunteer to attend events and bring their telescopes to share the night sky-whether it is at a school or a STEM event or an astronomy event! Can't wait to work with you guys in 2022!

Alexandra Nachman  
Events Coordinator

# Deep Sky Imaging Target Highlights for April

by James Yoder

The average low [temperatures](#) for April in the Phoenix metro area is 60° F. We have two new moons this month; April 1st and April 30th. Astronomical data presented here is for April 1st. Astronomical dusk at 8:12pm and Astronomical dawn at 4:51, giving us 8:39 hours of imaging time.

In this month's list there are 97 object/configuration combinations provided of just about every class of deep sky object including 15 Globulars, 2 Open Clusters, 5 Planetary Nebulas, 2 Nebula and 1 Dark Nebula, 70 Galaxies/Galaxy Clusters. Galaxies dominate the night sky with Globulars starting to come in the morning sky.

In addition to our monthly imaging deep sky objects there are two planetary near misses this month that may make for an interesting imaging opportunity.

Date	Time	Event	Images	Comments
April 4 <sup>th</sup>	05:16 AM	Mars/Saturn pairing	<a href="#">Image 1</a> , <a href="#">Image 2</a>	28' 59.2" Separation
April 30 <sup>th</sup>	05:10 AM	Jupiter/Venus pairing	<a href="#">Image 1</a> , <a href="#">Image 2</a>	24' 35.4" Separation

The [Prospective Imaging Objects guide](#) (PDF download) covers objects that reach their highest point in the sky and crosses the meridian (aka Transit) sometime between Astronomical Dusk to Dawn. We will be highlighting objects that transit roughly between 10pm and 2am. This ensures maximum imaging time over the month.

Happy Hunting!

## Some Highlighted Targets for April

Configuration	Page	Object	Type	ImageLink
<b>Hyperstar</b>	3	Bode's Galaxy and Cigar Galaxy (M-81, M-82)	Galaxy Group	<a href="#">171 min</a>
<b>Hyperstar</b>	17	Markarian Chain	Galaxy Group	<a href="#">170 min</a>
<b>Reducer(0.7)</b>	15	M-106 Galaxy Group	Galaxy Group	<a href="#">85 min</a>
<b>Reducer(0.7)</b>	23	Whale and Hockey Stick (NGC4631, NGC4656)	Galaxy Pair	<a href="#">155 min</a>
<b>Primary Focus</b>	23	Sombrero Galaxy (M-104)	Galaxy	<a href="#">Image</a>
<b>PrimaryFocus</b>	19	Cocoon Galaxy (NGC-4490)	Galaxy	<a href="#">304 min</a>

Resources:

- [ArtCentrics.com](#) – [April Potential Targets Guide](#) (PDF download)
- [Telescopius](#) – Lookup objects, plan imaging session.
- [Field of View Calculator](#) – Test Different Telescope, camera & eyepiece combinations.
- [Astrometry.net](#) – Solve images captured by your system. Get image RA/DEC, pixel scale, image size, orientation of the image you have taken.



## 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](#).

Gilbert Rotary Centennial Observatory is open on Saturday from sunset until 9:30pm. We need volunteers. Training is provided. Help us engage the community in the wonders of the night sky. Email [grco@evaonline.org](mailto:grco@evaonline.org) for information.

**FIRST QUARTER MOON ON APRIL 8 AT 11:47**

**FULL MOON ON APRIL 16 AT 11:55**

**LAST QUARTER MOON ON APRIL 23 AT 04:56**

**NEW MOON ON APRIL 23 AT 13:28**

## Classified Ads

### Used Equipment

Contact Darrell Spencer at [darrellspencer10@gmail.com](mailto:darrellspencer10@gmail.com) or 480-363-9463 if interested in these items.

Celestron C11 Fiber OTA, Fastar with Losmandy rail - \$1,200

Hyperstar V3 for C11 - \$750

Celestron C1700 mount/tripod with AAM encoders and Sky Commander controller - \$750

Celestron (Vixen) C6 6" Newtonian OTA - \$150

Televue Eyepieces:

Nagler Zoom (3-6) - \$325

Nagler 7mm 7T1 - \$160

Nagler 12mm 12T4 - \$285

Numerous classic long focus Japanese Achromats from the '50s – '70s.

Photos available upon request. All prices subject to reasonable negotiation.



SkyPi Remote Observatory

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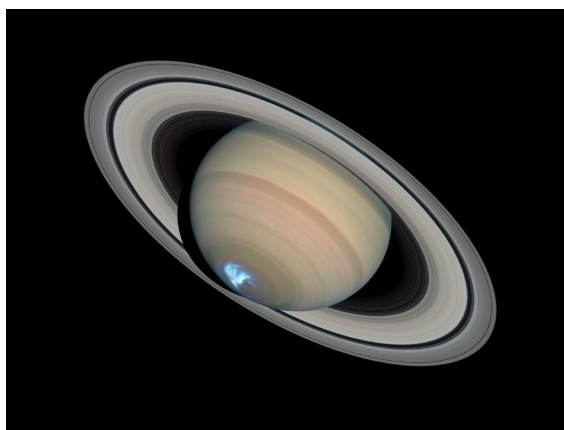
At the site: Bathroom facilities, running water, 5 pads w110v, wifi, acres of grassy camp sites.

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

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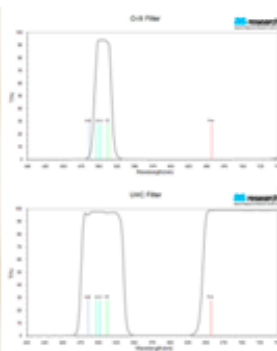
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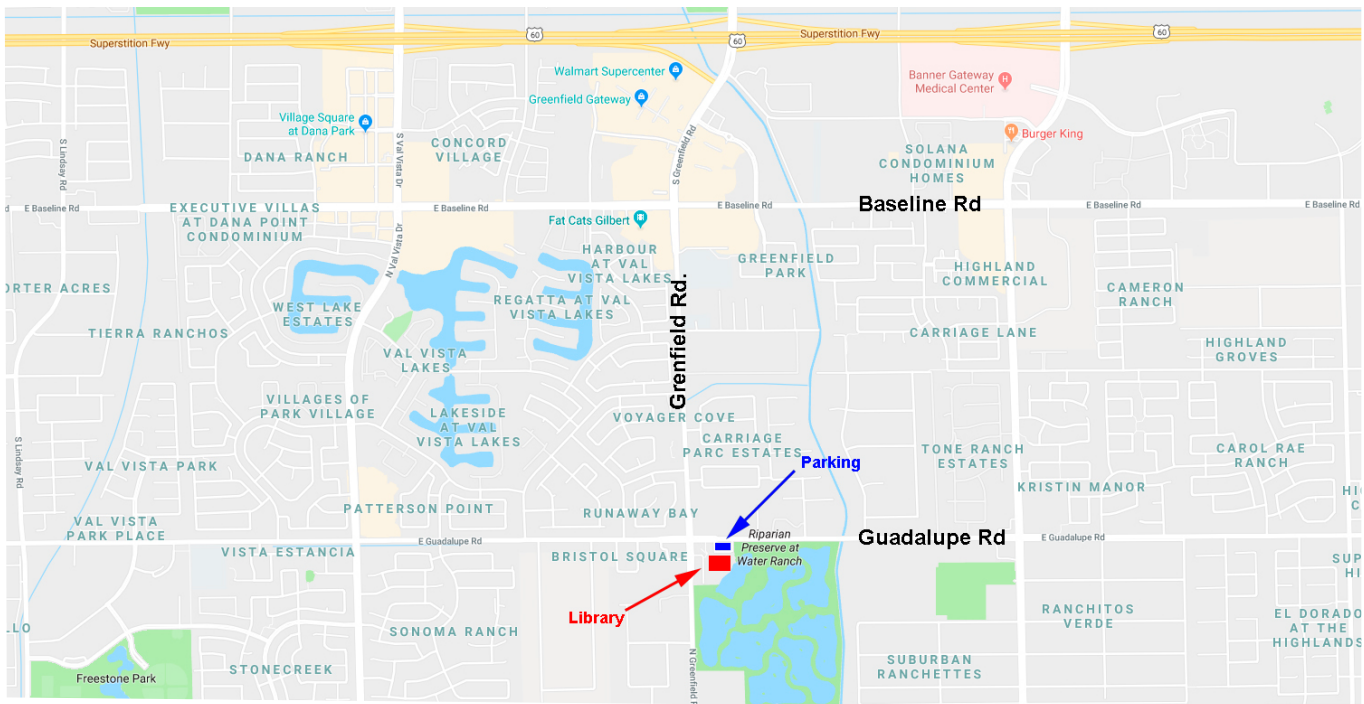
Monthly Meetings will be presented live online using Zoom. See the EVAC Website for updates. All other events are on hold until health concerns are resolved.

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**



## APRIL 2022

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

**April 15** - 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.**

## MAY 2022

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	<b>20</b>	21
22	23	24	25	26	27	28
29	30	31				

**May 20** - 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 – 2022 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:

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 \_\_\_\_\_

*The Observer is the official publication of the East Valley Astronomy Club. It is published monthly and made available electronically as an Adobe PDF document the first week of the month. Please send your contributions, tips, suggestions and comments to the Editor at: [news@evaonline.org](mailto:news@evaonline.org). Contributions may be edited. The views and opinions expressed in this newsletter do not necessarily represent those of the East Valley Astronomy Club, the publisher or editor.*

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[www.evaonline.org](http://www.evaonline.org)

East Valley Astronomy Club  
PO Box 2202  
Mesa, Az. 85214-2202

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