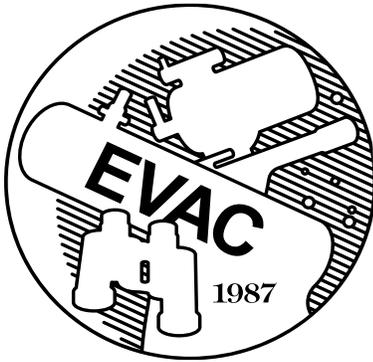


THE OBSERVER

VOLUME 35 ISSUE 10



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 still 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.

We are now in EVAC "Officer Election Mode" for 2022. Although candidate submittal is normally opened during October's General Membership Meeting, we are accepting submittals now due to the meetings being online. Just let one of the club officers know. You can use the officer links in our club website or email an officer directly. We need to know all of the candidates by a few days after the October 15th meeting so we can include them in the November newsletter. Voting on each posi-

UPCOMING EVENTS:

All meetings will be held online.

EVAC Meeting via Zoom - October 15th.

Tyler Richie-Yowell ASU Phd Candidate - "Evaluating Planets Orbiting K-Stars for "Super Habitability".

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From the Desk of the President

by Gordon Rosner

Continued from page 1

tion's candidate is by the club membership held during the November General Membership Meeting, which is expected to still be online. 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. A description of each position is also included in a separate article later on in this newsletter. Refer to that for more information.

Our Properties Director position has been filled by James Yoder. You will recognize him for his imaging website. James is also contributing to our newsletters by now giving us monthly imaging targets. Thanks James, for your support of our club.

October is meteor season! There are seven meteor showers that reach peak activity during the month! Have your meteor shower umbrella handy!

October 5 – Peak of the Camelopardalid Meteor shower
October 8 – Peak of the Draconid Meteor Shower
October 10 – Peak of the Southern Taurid Meteor Shower
October 11 – Peak of the Aurigid Meteor Shower
October 18 – Peak of the Geminid Meteor Shower
October 21 – Peak of the Orionid Meteor Shower
October 24 – Peak of the Leonid Minorid Meteor Shower

For all of us who were counting on the latest James Webb Space Telescope launch prediction of 31 October, it has now been delayed to 18 December.

And again, as I mention every month, everyone should remember that live member presentations are always a fun and valuable part of our monthly online Zoom meetings. Another excellent example by Bob Buchheim 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 Membership Meeting will be on Friday, 15 October starting at the usual 7:30PM. The main presentation will be by Tyler Richey-Yowell, PhD Candidate at ASU, titled "Evaluating Planets Orbiting K-Stars for "Super Habitability"".

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.
2. Sign up for the evac-announce@freelists.org mailing list. Directions on how to do this and the link are included later in the 'Find Out What's Happening' section of this newsletter.
- 3) Sign up for the 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.

I'll 'see you' at our 15 October 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

EVAC Zoom Meeting Notes for 2021 September 17th, 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 2021-09-17](#)).

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
- Officer Elections
- Club News
- Officer Elections
- Member Presentations:
 - Steve Dodder - “Grand Canyon Star Party on the North Rim”.
 - Bob Buchheim – “Three items, Something you don’t see every day”.
 - Main Presentation - Dr. Nathan Williams, NASA/JPL “The Mars Helicopter ‘Ingenuity’: First 6 Months on the Red Planet”.

Gordon welcomed everyone in the virtual audience with his “Live Long and Prosper” slide. Next was the slide listing the club officers. The appointed position of Property Director has been filled by James Yoder.

All elected officer positions are open due to term limitations for those currently serving. These positions are: President, Vice President, Treasurer, Secretary, and five Board Members at Large. Nominations will be accepted at the October meeting, and elections will be held at the November meeting. The responsibilities of each position are listed on the club website.

Under club news, Gordon reminded us that all club sponsored events with personal contact are still cancelled except for private star parties at GRCO consisting 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. Member presentations and articles for the Observer are welcome. Information on how to submit is on the club website.

Our next regular club meeting will again be a virtual Zoom meeting at 7:30 p.m. on Friday, October 15. Tyler Richey-Yowell, a PhD candidate at ASU, will present “Eval-

uating Planets orbiting K-stars for ‘Super Habitability.’” Register for the meeting in the usual way by the link in the invitation email.

Gordon next introduced Bob Buchheim who identified 4 stars which have been traced to a small satellite galaxy which has been integrated into the Milky Way galaxy. He described how they have been identified. These 4 stars are bright enough to be visible with binoculars. Bob also shared information about how we may join the American Astronomical Society as an Amateur Affiliate for a fraction of the price of full membership and without sponsorship. Finally, he mentioned that the AAVSO will be having a hybrid meeting November 6 and 7 in Boston. Details can be found at aavso.org/110-annual-meeting.

After handing the meeting over to Tom Mozdzen, Tom introduced the main speaker, Dr. Nathan Williams with NASA/JPL.

Developing a helicopter for Mars was a challenge as Mars has only 1% the amount of atmosphere that Earth has. The resulting design has a large wingspan, small mass and high rotor rotation rate. Communication was limited to the rover, and the two cameras – navigation and color imaging – were commercial off-the-shelf items each weighing about 1 gram. The onboard computer was also an off-the-shelf item. The mission was a technology demonstration, to prove that it could be done.

Since the helicopter was stowed underneath the rover, the landing location needed to be smooth and Ingenuity needed to be protected from debris kicked up during the landing. Within the first 3 flights, all mission objectives had been achieved. Then it was on to bigger and better things.

The images obtained by Ingenuity have a resolution of a few centimeters compared to 10’s of centimeters from the Mars orbiting satellites. Navigation is accomplished using the downward looking navigation camera taking images at 30 frames per second. Each successive frame is compared to the previous one to determine ground speed and direction. The only anomaly occurred in flight 6. This happened while taking color images, when one frame was dropped due to a full image buffer in the onboard computer. Ingenuity became somewhat erratic in attitude

EVAC Zoom Meeting Notes for 2021 September 17th, at 07:30 P.M. AZ Time

by Wayne Thomas

Continued from page 3

but still landed safely. Following this event, no color images were taken for the next flights.

Flights 4 through 13 were used for reconnaissance and science. Ingenuity could fly over terrain which the rover could not handle. Also, it could reach a destination well in advance of the rover. Outcrops and a triple fracture feature were imaged. After 13 flights, no signs of wear have been detected.

Following his talk, Nathan answered the following questions:

What was a typical day at work following graduation? Prior to the pandemic a typical day was 9 to 5 working with scientists and engineers. However, the past 6 months have been anything but typical. My schedule and that of others on the mission was tied to the length of the Martian day – 24 hours 40 minutes. Sometimes I started in the morning and finished up at night. Other times I started in the evening and didn't finish until late the following morning.

How fast and how far has Ingenuity flown? When close to the ground, up to 5 m/s. If higher, then faster. So far, the distance record is 620 meters. Ingenuity cannot fly higher than 15 meters due to a hard coded limit in the computer software. Also, a flight distance of 1 kilometer and a flight time approaching 3 minutes may be possible.

What is the life expectancy of Opportunity? Maybe March of next year. So far, the boundaries have been pushed a lot. At some point the end will come.

The rotor speed seems very fast. Yes, the nominal speed is 2500 RPM. It has been tested up to 2800 RPM on the ground. The performance on Mars is better than in the test facility.

Were dust devils seen, and will they help keep the photocells clean? Dust devils were observed in the images from flight 4 or 5. However, the vibration of Ingenuity in flight keeps the dust off. The power actually increased during the first flight.

Was there a provision in the design to keep the dust off? The vibration of Ingenuity removes the dust. During the first flight there was a significant increase in power as the dust was shaken off.

How does the blade design compare to the design of helicopter blades here on Earth? On Ingenuity the blades are still airfoils – just broad and deep. And they are very light weight.

Were there any cancelled options? Yes, but it was subsequently added back into the extended program.

How far can Ingenuity fly? Less than 2 kilometers. Design considerations suggested Ingenuity would be out of radio range at about 300 meters. However, at 700 meters the data rate was still high which was longer than tested prior to launch.

Are there any risks associated with using off-the-shelf hardware? A coronal mass ejection had no effect on the helicopter including the 2 cameras and the snapdragon processor. This approach is intended for a demonstration, not a long duration mission

Boundaries, models, schedules, and priorities? We use orbital images to select landing sites. We use Monte Carlo computations and Heli-rti for our simulations. Priorities are set by management in consultation with the science team. Based on the various parameters used, we determine the uncertainties associated with each set to make a decision.

What happens when Mars goes behind the Sun? The conjunction will last for two weeks. For both the week prior to conjunction and the week after, we will only receive data. Then following the week after conjunction, we will again begin sending commands to Ingenuity. The communication goes from Ingenuity to the rover, then from the rover to one of the Mars orbiting satellites, and finally from the satellite to Earth.

ASU will have an open house sometime in April.

Our next meeting will be on Friday, October 15, at 7:30 p.m. via Zoom. We will hold nominations for officers, and PhD candidate Tyler Richey-Yowell will speak on "Evaluating Planets orbiting K-stars for 'Super Habitability'."

Gordon adjourned the meeting at 9:25 p.m. Attendance was at least 91.

Wayne Thomas, Secretary
EVAC

Which Club Officer Position Are You Interested In?

by Gordon Rosner

As I mentioned in my above article, we are now in EVAC "Officer Election Mode" for 2022. We are accepting candidate submittals now through a few days after the October online meeting. Just let one of the club officers know. You can use the officer links in our club website or email an officer directly. 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 during the November online General Membership Meeting.

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. And of course, all current officers will help in the transition of new officers and will be a resource any time thereafter.

The following provides a brief description and main duties of each open officer position. Detailed duties are included in the club's Constitution and Bylaws, and Policy and Procedures documents with links included at the bottom of the main page of our club's website. 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.

Which position are you interested in?

President:

- Ensures that the other officers of the organization conduct their offices properly.
- Provides the leadership necessary to maintain a smooth-running organization.
- Presides at all General Assembly and Board of Directors meetings. Votes only in case of a tie.
- Is one of two officers (the other being the Treasurer) with check signing duties and privileges.
- Proof reads the monthly newsletter prior to publishing.

Vice President:

- Serves in the President's place in the event the President is absent or unable to serve for any reason.
- Is in charge of club programs and publicity.
- Responsible for coordinating and scheduling the general meetings, and help in lining up presenters.
- Proof reads the monthly newsletter prior to publishing.

Treasurer:

- Responsible for the club's budget, club capital, investments, checking account, and financial matters.
- Maintains the club's official membership list.
- Provides periodic reports to the Board of Directors.

Secretary:

- Is the custodian of all official documents and records of the organization.
- Records the minutes of all meetings of the General Assembly and the Board of Directors.
- Proof reads the monthly newsletter prior to publishing.

Board Member at Large:

- The five Board Members at Large represent the diverse astronomy community and present the thoughts and visions of the club's members for discussion by the full Board of Directors.
- Some suggestions may be incorporated by means of a vote by the full Board of Directors.

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. Next year will certainly be exciting as we are anticipating to rise out of the pandemic and get back to all the in-person activities we have so missed. Again, which leadership position are you interested in for 2022?

The Backyard Astronomer

by Bill Dellenges

Sitting Ducks for All Seasons?

Somewhere along my stargazing adventures I became aware of how easy it was to find some objects in the night sky. They were sitting ducks! You didn't need to be an advanced observer to find them because either nearby stars pointed right at them or they were very close to a bright star. While GOTO scopes make this enterprise moot, observers with small grab and go telescopes or binoculars might find the following tips useful. We shall take a look at some "low hanging fruit" beginning with a few fall objects.

M15 - Globular Star Cluster in Pegasus: Piece of cake. A line from Theta Pegasi to Enif (The horse's nose) extended half that distance delivers you to one of the best globular clusters in the sky.

M31 - The Andromeda Galaxy: Yes, it can be seen naked eye in a dark sky. But it's likely most observers will have at least enough light pollution to preclude spotting this beauty. If you know the constellation of Andromeda, simply imagine a line from Beta Andromedae (Mirach) to Mu Andromedae and extended that same distance. Put your finder scope on that spot, sweep to it and bingo, it should be in your low power field. The galaxy is 2.5 million miles away and approaching us at 68 miles a second. But don't expect to notice M31's brightness increasing during your lifetime.

M52 - Open Star Cluster in Cassiopeia: Sashay from Shedir to Caph and continue that same distance. M52 is a hair north of that point.

Winter:

M41 - Star Cluster in Canis Major: Sirius, at magnitude -1.4, is the brightest star in the night sky. Slide down four degrees due south of the Dog Star to scoop up this fine cluster. It's big, more than half a degree across, so use low power or binoculars to appreciate its splendor.

M42 - The Orion Nebula: Everyone knows Orion, right? I certainly hope so (or you're fired). Look below his conspicuous three star "Belt" to find the three star "Sword." The fuzzy middle star is M42.

M46/47 - Star Clusters in Puppis: Following his dog breath, go back to Sirius. A line drawn from Sirius northeast to

Gamma Canis Majoris extended twice that distance gets you close to this dynamic duo. Just nudge your scope south the width of a flea collar held at arm's length. Notes: The clusters are 1 ½ degrees apart. M46 has a foreground planetary nebula, NGC 2438, on its north side and its stars are finer than M47's courser gems (M46 is further away than M47).

Spring:

M3 - Globular Star Cluster in Canes Venatici: M3 is one of the more impressive globular star clusters. While not near a bright star, it can easily be found by drawing a line east from Gamma and Beta Comae Berenices extended three quarters that distance (5 degrees). Granted these guide stars are faint, 4th magnitude. If difficult to find, use Plan B: M3 lies midway on a line from Cor Caroli to Arcturus in Bootes (a tad closer to the latter).

M5 - Globular Star Cluster in Serpens Caput: Like M3, we use guide stars of an adjacent constellation (Virgo) to find this fine globular. Note Tau and 109 Virginis point east right at M5 just as Gamma and Beta Comae Berenices pointed at M3.

M65/66/NGC 3628 - Galaxies in Leo: The Leo Trio can be found at the eastern end of the Lion about midway between Theta (Coxa) and Iota Leonis or slide 3 degrees SE of Coxa. All three can fit in a one degree field of view. M65/66 are conspicuous, NGC 3628 north of them is much fainter. Jiggling your scope slightly helps bring it out.

Summer:

There are so many sitting ducks in summer you can hear the din of quacking outside. Here's a brief description of six of them:

M4 - Globular Star Cluster in Scorpius: This lovely object is simply 1 ½ degrees west of the super red giant star and "Rival of Mars", Antares.

M7 - Open Star Cluster in Scorpius: The two "Stinger" stars of the Scorpion ("The Cat's Eyes", Nu and Upsilon Scorpii) point NE to what appears to be a small, detached piece of the Milky Way five degrees away. That's M7, my favorite open star cluster after the Pleiades.

The Backyard Astronomer

by Bill Dellinges

Continued from page 6

M11 - Open Star Cluster in Scutum: Again, we need the help of an adjacent constellation, Aquila and its two tail stars Lambda and 12. They aim SW to M11, about two degrees away. Do you see Admiral Smyth's Flight of Wild Ducks? Quack if you do.

M13 - Globular Star Cluster in Hercules: One third of the way from Eta to Zeta Herculis in the "Keystone" of Hercules.

Deep Sky Imaging Target Highlights for October

by James Yoder

One of the advantages of owning a Celestron Schmidt-Cassegrain is the ability to purchase accessories that extend the range of objects to image. Excluding eyepiece projection, there are three primary configurations available to this type of telescope: Primary Focus, Focal Reducer and Hyperstar. The table below provides imaging options for Celestron telescopes linked to a full frame camera. What is the field of view, f-ratio for your system? Use the [Field of View Calculator](#) on the [Astronomy.Tools](#) website to find out. Depending on your physical setup, the calculated FOV may not always match your physical FOV. If so, it is usually best to take an image with your configuration and solve the image using a tool like the one provided on the [Astrometry.net](#) website where it provides the details of the actual field of view for your configuration.

Celestron Schmidt-Cassegrain Configurations

Aperture	Light Gathering Power	Primary Focus	Focal Reducer (0.7)	HyperStar
9.5"	1127x	FL=2,350mm f/10 FOV= 0.54°x0.36°	FL=1,645mm f/7.0 FOV=0.78°x0.52°	FL=540mm f/2.3 FOV=2.37°x1.58°
11"	1593x	FL=2,800mm f/10 FOV= 0.46°x0.30°	FL=1,960mm f/7.0 FOV= 0.65°x0.44°	FL=540mm f/1.9 FOV=2.37°x1.58°
14"	2579x	FL=3,910mm f/10 FOV=0.33x0.22°	FL=2,737mm f/7.69 FOV=0.47°x0.31°	FL=675mm f/1.9 FOV =1.9°x1.26°

While the [Monthly Prospective Imaging Objects document](#) I create is specifically for a C-11 with a full frame camera, you may discover it useful even if your system is quite dif-

M57 - Planetary Nebula in Lyra: The Ring Nebula is located between the tight space between Gamma and Beta Lyrae, a little closer to the latter.

You won't break a sweat going after these easy pickings.

ferent. Since the guide covers a Field of View (FOV) range from about 0.5° to 2.0° it is likely you can find objects in this guide that closely match your system.

Do you want to know how the object frames in your system? The [Telescopius](#) website is great for this. Once you enter the details of your telescope setup, you can look up an object and frame it as you would like to get the exact coordinates to plug into your mount when you are ready to start imaging.

There are many potential targets every month, and this month is no different. [Octobers guide](#) (PDF Download) has 123 object/configuration combinations provided for just about every class of deep sky object. Provided below are some of the objects that are ideally positioned for imaging this month. Happy Hunting!

Some Highlighted Targets for October

Configuration	Page	Object(s)	Type	Image Link
Primary Focus	21	NGC-247	Galaxy	280min
Primary Focus	29	IC-1805	Diffuse Nebula	145min
Reducer (0.7)	21	NGC-246 , NGC-255 , PGC-2689	Planetary Nebula and Galaxies	190min
Reducer (0.7) - Mosaic	19	NGC-147 , NGC-185	Galaxy Pair	202min
Hyperstar	17	NGC-7822	Diffuse Nebula	105min
Hyperstar	22	NGC-288 , NGC-253	Galaxy and Globular	105min

New Camera and Saturn

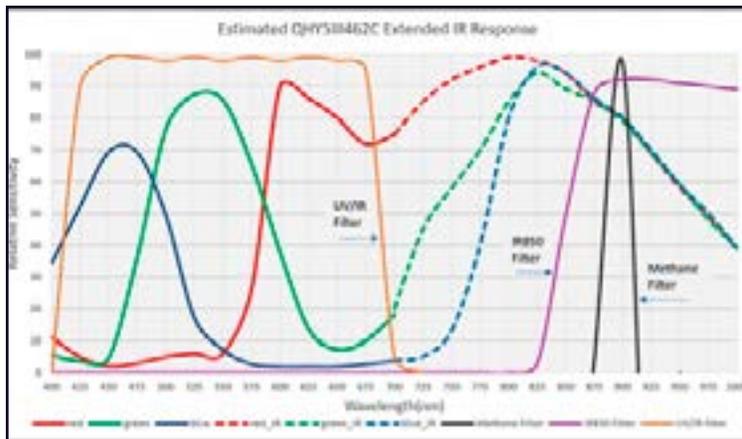
by Bruce Barron

New Camera and Saturn

I recently got a new CMOS camera – a QHY5III462C. This is a low-cost guiding/planetary camera. Basically, it's a 2 mega-pixel one-shot color camera with 2.9um pixels. This is great for planetary imaging but results in a very limited field of view in my setup that makes it difficult to see guide stars. The sensor has a 16x9 aspect ratio. The camera fits into a 1-1/4" eyepiece holder and is powered via its USB3.0 interface. It also has a standard guider interface.

The camera uses Sony's IMX462 CCD. This chip is somewhat unique in that the pixel color filters are transparent above around 830nm (8300A) in the near IR and the sensor works to above 1000nm (10000A) so it's good for imaging in the near infrared range. This is one of the reasons that I got this camera.

The basic camera comes with a standard filter to filter out the IR. It also comes with a second filter that filters out the visible light but passes the IR. I purchased the "deluxe" package (for about \$50 more) that adds a "all sky" lens and a cs-lens adapter as well as a third filter – a narrowband IR filter centered at 890nm corresponding to the methane line. Below is a curve of the sensor response overlaid with the curves for all three filters.



One criticism that I have is that the instructions do a fair job discussing software but are very limited with respect to the hardware. There are several pieces in the set without a description or information about how to use them. Also, the scope side of the camera appears to have a non-standard thread. There is an included adapter that contains a glass window that screws into the camera and has female threads for standard 1-1/4" filters. There is a second adapter with a window that screws into the camera and has fe

male threads for a CS lens. There are the three filters which fit the first adapter and an AllSky lens that fits the CS adapter. All OK so far. Then there is another adapter and a plastic spacer/washer whose purpose is unknown.

I've just started playing with the camera using MaxIM DL for single frame captures. I'm also learning AutoStakkert, relearning Registax and learning the differences between CCD and CMOS devices. I'm not happy with imaging stars or deep space objects yet and need to experiment more with the gain and offset parameters. Normally I'd wait until I became more familiar with both the hardware and software before writing anything but I got some results last night that I want to share.

Note: I live in Peoria and to image the planets I have to look across Phoenix and all of the thermal currents rising from the city in the early evening after a very hot sunny summer day. It sure was a lot nicer when I was living in Chandler.

I took images of Saturn in visible, wideband IR and narrowband IR with very interesting results. See the three images below. I'm sorry about the changes of orientation. I had to remove the camera from the scope and everytime I changed filters I didn't reinstall in the same orientation. The scope was an 8" Celestron SCT.



Fig 2. Saturn In Visible

New Camera and Saturn

by Bruce Barron

Continued from page 8



Fig 3. Saturn Wideband IR



Fig 4. Saturn Narrowband IR

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 OCTOBER 6 AT 04:05

FIRST QUARTER MOON ON OCTOBER 12 AT 20:25

FULL MOON ON OCTOBER 20 AT 07:56

LAST QUARTER MOON ON OCTOBER 28 AT 13:05



[SkyPi Remote Observatory](#)

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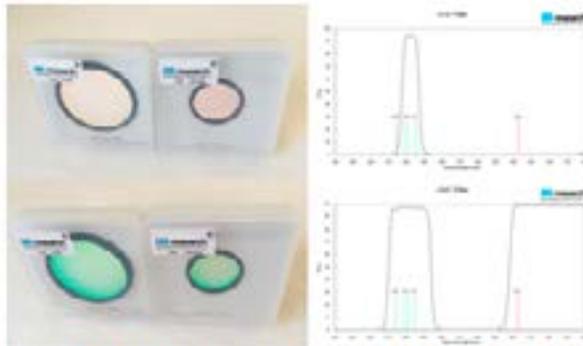
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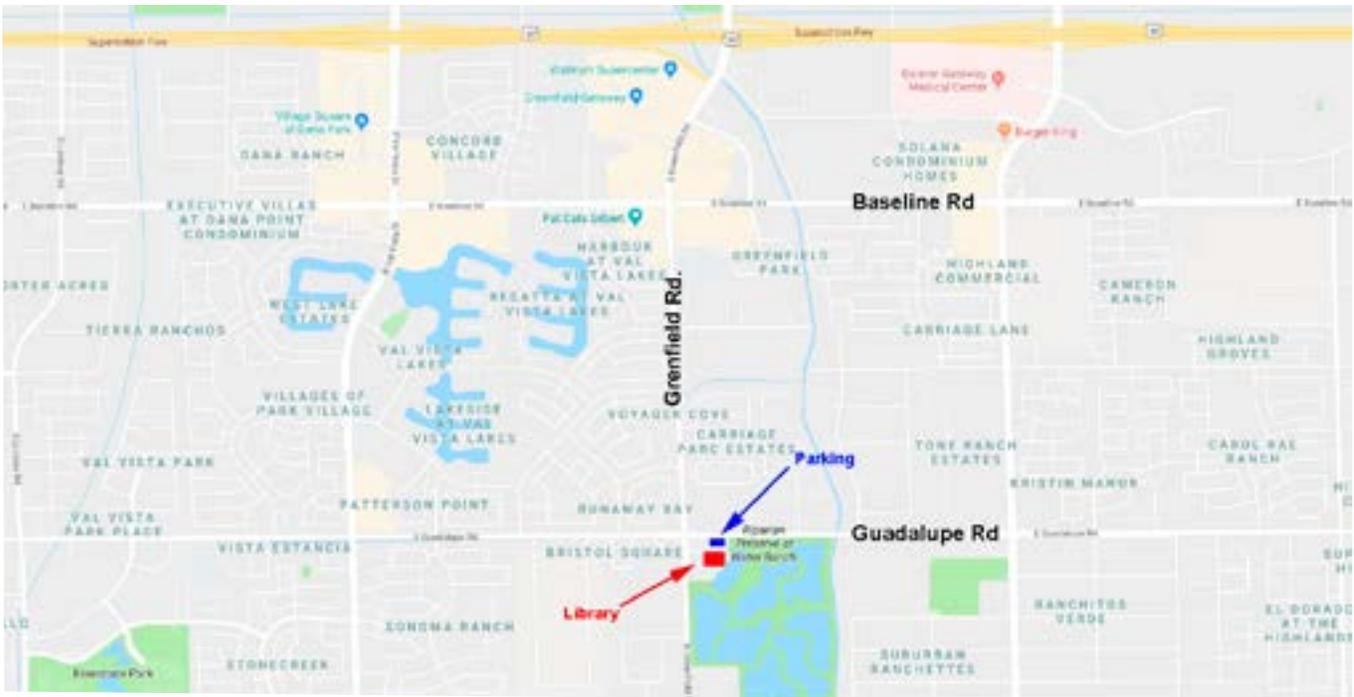
Monthly Meetings will be presented live online using Zoom. See the EVAC Website for updates. All other events are on hold until health concerns are resolved.

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**



OCTOBER 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	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.**

NOVEMBER 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	29	30				

November 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, February & 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	<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. 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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The East Valley Astronomy Club is a 501(c)(3) nonprofit charitable organization.

www.evaonline.org

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