Volume 34 Issue 7

July 2020

The Observer

M17 Omega Nebula Star Factory - APOD 09/19/2000
Image Credit: SOFI, NTT, ESO

Upcoming Events:

Some meetings will be held online.

EVAC Meeting via Zoom - July 17

Inside this Issue:

From the Desk of the President

by Gordon Rosner

Greetings from your President.

I sure hope everyone is still doing well and keeping healthy. It's getting to be a long time since we've been able to get together for our usual group functions we love so much. Sadly it looks like that is going to continue for quite some time. When we originally cancelled all group functions to support the safety of our club members we were hoping it would be short term and hopefully be over by now with implementation of new normal (or maybe abnormal) club processes and operation. We were compiling thoughts and options about how GRCO may reopen and operate and maintaining discussions with other Arizona astronomy clubs on actions being taken there.

However, here we are now still deep in the health concerns of any group activities. The hope was that things would be better by now, but reality is things are worse. So, all EVAC in-person group activities are still cancelled and we are still uncertain when they will return. May I remind everyone that this still applies to any Picket Post Trailhead activities. Any gatherings at Picket Post are up to individuals and none are EVAC sponsored events. Picket Post is a nice dark sky site with the parking lot open to the public with people still going

From the Desk of the President

by Gordon Rosner

Continued from page 1

there for some great viewing and astrophotography. If you do go there, that is your personal decision and proper safety precautions must be observed by each individual. Any activities there, or at any other locations, are entirely personal decisions with no EVAC endorsement, guidance or oversight.

OK, enough bad news. Now on to the good news (or maybe not so bad news). The club is now doing monthly General Membership Meetings online via the Zoom computer based platform. The format mirrors the usual meeting process with an agenda, business updates, member presentations, then our main presentation. The meetings start at 7:30PM on the Fridays that we usually would have our monthly meetings but they don't run as long because there are no breaks with all those great snacks and drinks that Janet Cotie prepares and presents to us. Plus there are no after meeting get-togethers at the Union Bar and Grill that some of us frequented. However, we turned a negative into a positive by implementing this new astronomy tool using computer online technology. Sort of like the jump from film to digital astrophotography. Well, maybe not so big a jump. I'm just trying to make everyone feel better about such a major change.

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

This universal online exposure has brought us a new avenue of amateur astronomy. Other clubs, observatories, and organizations are also doing online presentations. An example of this was the online events provided by the Grand Canyon Star Party last month that I know some of you followed. Visit the websites of other astronomy clubs and public observatories to see what future presentations they are providing. Some other club and observatory links are listed in our EVAC website.

Our Vice President, Tom Mozdzen, is the leader of our online activities and has exciting main presenters scheduled for the next few months. One will be online from Boston and another actually from Australia. But, we need volunteers for the ten minutes or so member presentations. The member presentations round out our meetings. The main presentations are certainly technical and educational, and bring us up on what is happening in the professional fields. The member presentations not only inform folks of the activities of our members, but also excite and motivate us to look deeper into the subject on their own and possibly perform the same activities. This concept is different from the main presentation where the speaker has an hour devoted more towards education. So, member presentations are more motivational for the general membership on what they can do or help with. "Hey, that's cool stuff! If Fred can do it, so can I or maybe I can even help him.". More towards something like that. So, if you are interested in doing a member presentation, please let me know via an email to president@evaconline.org. All you need is a PowerPoint, Keynote or similar format and an internet connection for your computer that has a microphone. You will receive a Zoom connection from Tom and if not familiar, member presenters can practice connecting and sharing their screen over Zoom with Tom a few days before the meeting.

As I mentioned, our leadership team still has no reliable prediction about when our public meetings at the library meeting room will resume or when and how our GRCO observatory will re-open. As our health professionals and governments struggle even more with the situation, the EVAC Leadership Team remains adamant to our club closures for all activities involving club functions of any personal gatherings. Please monitor our club's website for the latest information and take care of yourselves.

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

Your President,

Gordon Rosner

The Backard Astronomer

by Bill Dellinges (July 2020)

Attacking Summer Doubles with Binoculars

I find observing double stars fascinating. These little jewels offer various colors, magnitudes and complexity. Like snowflakes, no two are exactly alike. Did you know you can split many double stars with just a pair of binoculars? Since many stargazers have a pair of the ubiquitous, venerable 7x50 binocular, I will use my Vixen Foresta 7x50 on six summer double stars ranging in separation from 337" (arc seconds) to 22". If it fails, I will resort to my Lunt 16x70 to bust the rascal apart. Both instruments will be tripod mounted – with the tighter doubles, it's very difficult to determine if you have split the pair with a hand held binocular. Plus it's nice not having to put up with a jiggling image.

32 Camelopardalis (Cam): Components AB, magnitudes 5.3, 5.7, separation 22", position angle 326°. This double is closer to Ursa Minor than most of Camelopardalis, but the I.A.U.'s 1923 official constellation borders allow this near equal magnitude double star to snuggle up to the Little Dipper. You can find it by first drawing a line from Polaris to Kochab (Beta Ursa Majoris). Our target is just west of that line, or away from the Dipper, and slightly closer to Polaris. My 7x50 could not split it but the 16x70 could. Cute little guy, like two BB's.

Rho Ophiuchi (Oph): Quadruple star. AB 5.0, 5.74, 3.1", 340o. AC 5.0, 7.29, 151", 360°. AD 5.0, 7.0, 156", 253°. Like 32 Cam above, this quadruple seems like it should belong in Scorpius rather than Oph as it's only three degrees above Antares – but technically it's in Oph, albeit barely. Even a 9x50 finder can split it into three stars due to the generous separations of the C and D components from the primary. The 7x50 and 16x70 both show a neat little triangle of stars, the brighter unresolved AB pair and above it the C and D fainter components. The 16x70 could not split the 3.1" AB pair (I have split AB with an 85mm refractor at 75x). Kuma, Nu Draconis: AB 4.9, 4.9, 62", 311°. Kuma's equal magnitude stars look like cats' eyes in a dark alley, similar to 32 Cam. Kuma is the dimmest of the four stars that delineates the Dragon's head, a trapezoid not far from Vega. The 7x50 split it hand held. But as stated in the second paragraph, use of a tripod increases the enjoyment by many orders of magnitude. No pun intended.

Albireo, Beta Cygni: AB 3.1, 5.1, 34.4", 54°. This jewel needs no introduction; it's probably the favorite double star of any stargazer with a heartbeat. The yellow primary and blue secondary are a stunning sight, especially when just slightly out of focus which for this old colorblind geezer accentuates the colors. The 7x50 could not split Albireo. The 16x70 had no trouble doing so. For the record, I used to have a 10x70 that could crack Albireo open, so 10x must be the key to success on Albireo. Astronomers disagree as to whether Albireo is a true binary or just an optical double (chance alinement). Let them fight it out. In my book it's too pretty not to be a double (Don't ask me about Pluto's status).

30/31 Cygni: Since the B component in this quadruple is a very faint magnitude 13.1 star, let's just address: AC 3.8, 6.7, 107", 173° and AD 3.8, 4.8, 337.5", 338°, and we'll still get our triple. This lovely trio lies midway between Deneb and Delta Cygni. Just outside that line are two fourth magnitude stars one degree apart that stand out from the fainter background stars. The northern one is omicron 1 (32 Cygni). We want the southern one – omicron 2 (30/31 Cygni). The 7x50 easily splits the AD pair, a generous 337.5" (5.63') but barely revealed C. The 16x70 rendered a much more rewarding view of this triple. Noted double star observer James Mullaney calls it the Patriotic Star, as he sees the components as red, white and blue. Do you see those colors? I did, sort of.

61 Cygni: AB 5.2, 6.0, 30", 150°. This famous star was the first to have its distance determined using the parallax method by Friedrich Bessel in 1838 (11.4 light years). Recall the directions above for 30/31 Cygni? This star is on the opposite side of the long axis of the Swan between Deneb and Zeta Cygni. On a line between those two stars, and just outside of it, look for a triangle of stars composed of Tau, Sigma and Nu Cygni. They are bright enough to stand out from background stars (like 30/31/32 did). 61 Cygni is 1/3 of way from Tau to Nu in that triangle (well, a hair just outside of it). The 7x50 failed to split it, but I have split it with an 8x50. The 16x70 easily shows two stars.

Summary: The 7x50 nailed half of the double stars above, the tightest was Kuma at 62". But in the past the 7x50 has split 16 Cygni: AB 6.0, 6.3, 39.1,"134°. With the 16x70 I have split 40/41 Draconis' 18.9". So we can generally say the

The Backard Astronomer

by Bill Dellinges (July 2020)

Continued from page 3

7x50 can resolve doubles down to at least 39" and the 16x70 down to at least 19". One should keep in mind too that any binocular will do its best when attacking a double star when its two components are of equal magnitude. And don't forget the tripod, it's critical!

For those who are not into star hopping and may want to take a look at the above specimens with their Go To telescope, here are their Smithsonian Astrophysical Observatory (SAO) numbers: 32 Cam SAO 2101, Rho Oph SAO 184381, Kuma SAO 30447, Albireo SAO 87301, 30/31 Cyg SAO 49357, 61 Cyg SAO 70919.

One final thought – While the 7x50 offers great wide fields of view (and thus its popularity), if you are wanting to scrutinize double stars with something other than an elaborate telescope setup, it's hard to beat a tripod mounted 15x or 16x70 binocular. At the minimum, for use on double stars, I would recommend a 10x50. That extra 3x can mean the difference between victory or the agony of defeat.

EVAC Zoom Meeting Notes for 2020 June 19, at 07:30 P.M. AZ Time

by Wayne Thomas

Meeting minutes.

President Gordon Rosner welcomed those in the "audience" to the Zoom meeting at 7:32 p.m. with 52 in attendance. He emphasized that we are still an active club with Claude doing maintenance of the observatory, David H continuing to manage our property, and Marty keeping the website running and publishing the Observer monthly. However, we will continue to not hold meetings until the threat of Covid19 subsides which is still an unknown at this time.

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

Gordon then turned the meeting over to Wayne Thomas for his member presentation on Asteroid Occultations. Wayne described how an asteroid occultation is similar to but different from a solar eclipse. He showed a video of what an occultation looks like on the laptop. He then described the four steps in his process of observing an asteroid occultation – preparation, recording, analysis, and reporting. He finished up with a difficult occultation whose magnitude drop was small because the asteroid was brighter than the faint occulted star.

Tom Mozdzen then introduced the main speaker, Dr. Patrick Young who shared with us "Supernovae Life and Death Among the Stars"

One of the more recent supernova explosions in our galaxy has been dated to July 4, 1054 ACE. It left behind a neutron star and a supernovae remnant catalogued as M1 by Charles Messier in 1758. The power emitted during this supernovae explosion was roughly equivalent to the power of an entire galaxy such as M51.

Next he traced the evolution of the composition of the universe from 3 minutes after the Big Bang to today. At time 3 minutes, it consisted of 76% Hydrogen, 24% Helium, 1 part in a billion of Lithium, and one part in a trillion of Beryllium. Now some 14 billion years later, the metals (all elements other than H & He) have increased to 1.5% or an increase of a factor of 10 billion since the Big Bang. These include 92 naturally occurring elements. Many of these elements would not be present today if there had been no supernovae explosions in the past.

Now for the age of the Solar System and what might have kept the Sun shining for so long. Based on elements found in meteorites, the age of the Solar System is 4.45679 billion years +/- 0.0002 billion years. The question then becomes, how could the Sun continue to produce energy over such a long time. Knowing the mass of the Sun, if it were composed purely of carbon, burning coal would only keep the fires burning for about 15 thousand years. Gravitational contraction releases energy as heat and could maintain its temperature for a bit longer say 10 million years. Still not nearly long enough. Fission of radioactive elements could produce energy even longer still up to a billion years, but still not 5 billion years. Finally, nuclear fusion will keep the fires burning for more than 5 billion years.

EVAC Zoom Meeting Notes for 2020 June 19, at 07:30 P.M. AZ Time

by Wayne Thomas

Continued from page 4

Combining 4 Hydrogen atoms into one Helium atom creates a Helium atom with 0.7% less mass. This loss of mass is converted into energy by that famous equation. For stars much more massive than our sun, they will run out of Hydrogen in as little as a few million years. Next they would fuse Helium into Carbon which our sun will do a few billion years in the future. Betelgeuse is probably finished burning Helium into Carbon and is now fusing Carbon into Neon, and then Magnesium, and then into Sodium… During this stage, the core of the star will contract, and the outer layers will expand. Betelgeuse has now become large enough for us to image its surface from Earth. If it were located where our sun is, the outer reaches of its atmosphere would extend to the orbit of Jupiter.

Once Oxygen burning starts, the star creates Silicon, Sulfur, Aluminum, and Phosphorous. This stage lasts for only about 6 months. When Oxygen burning ceases, Silicon burning starts creating more massive elements. At this point, Betelgeuse will have only 1.5 days remaining until it explodes. Successive nuclear fusions after Oxygen release energy until the end product Iron is produced. Since Iron-56 requires energy to make anything heavier, it absorbs energy instead of giving up energy in any fusion reaction. This causes the star to collapse onto its neutron core and the rebounding shock wave explodes the star in a type 2 supernovae.

Based on the chemical composition of meteorites, it is believed a supernovae exploded in the neighborhood of where the solar system was to form. The supernovae produced the radioactive element Al-26 which lasts only about 700,000 years. By examining Calcium-Aluminum inclusions in meteorites, the solar system must have formed soon after the nearby supernovae explosion.

Dr. Young ended his presentation by showing a video of the model of an exploding supernovae. He described how the different compositions of the stars interior produce plumes of material accelerating outward. The modeling technique he uses is called Smooth Particle Hydrodynamics and treats each group of particles as a smoothly interacting mass of material. His modeling produces structures which compare favorably with the structure of today's supernovae remnants such as M1 in Taurus.

Our next meeting on July 17 will feature guest speaker Dr. Jessie Christiansen presenting "On the Road to a Billion Planets."

And, to see the latest, visit EVAC's Facebook page.

The total attendance at this meeting was 64 (out of 102 who signed up). The meeting was adjourned by Gordon/Tom at 8:58 p.m.

Wayne Thomas, Secretary

EVAC

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

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

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

Looking for that perfect weekend activity?

Why not resolve to getting involved?

Contact Claude Haynes to join the staff at GRCO

Email: grco@evaconline.org

EVAC Outreach Events
by Gordon Rosner

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

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

Gordon Rosner
EVAC Outreach Events Coordinator

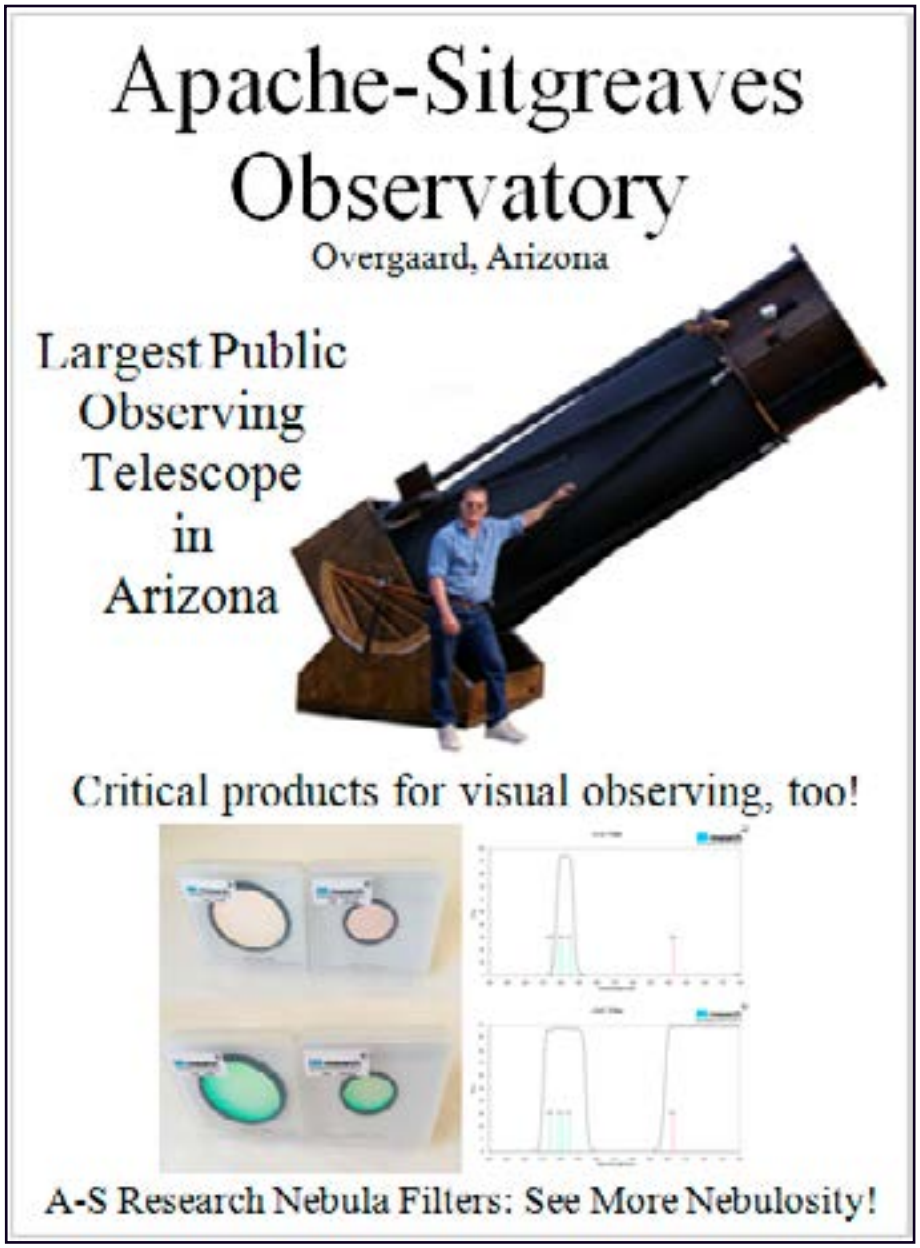
Full Moon on July 4 at 21:44

Last Quarter Moon on July 12 at 16:29

New Moon on July 20 at 10:33

First Quarter Moon on July 27 at 05:33

Classified Ads



Classified Ads

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

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

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

IC 405

Insight Observatory
16" ATEO 1 Telescope

SkyPi Remote Observatory

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

The monthly general meeting is your chance to find out what other club members are up to, learn about upcoming club events and listen to presentations by professional and well-known amateur astronomers.

Our meetings are held on the third Friday of each month at the Southeast Regional Library in Gilbert. The library is located at 775 N. Greenfield Road; on the southeast corner of Greenfield and Guadalupe Roads. Meetings begin at 7:30 pm.

Visitors are always welcome!

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

July 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	**17**	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June 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.**

August 2020

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

August 21 - EVAC Monthly Meeting Live

Online via Zoom

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

East Valley Astronomy Club -- 2020 Membership Form.

IMPORTANT: All memberships expire on December 31 of each year

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

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

Renewal (current members only):

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

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

Name Badges: Quantity: _____

☐ **$10.00** Each

Name to imprint: _____

Total amount enclosed:

Please make check or money order payable to EVAC

Payment will be made using PayPal ☐

Name: | Phone:

Address: | Email:

City State Zip | URL For website

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

How did you discover East Valley Astronomy Club?

Liability Release Form

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

My signature upon this form also indicates agreement and acceptance on behalf of all minor children (under 18 years of age) under my care in attendance. EVAC only recognizes those who are members or invitees and who also have a signed Liability Release Form on file as participants at an EVAC Star Party.

Signature _____ Date _____

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

www.evaconline.org

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