

TAAA Desert Skies Bulletin

Observing Our

Desert Skies

Since

1954



July 2024

www.tucsonastronomy.org

Membership Meeting

July 5, 2024 Online Meeting

TAAA's next general member meeting will be held on **Friday, July 5, 2024**. The Main Presentation will start at 6:30 P.M. This will be a hybrid meeting (both in person and on social media). TAAA members will receive a Zoom link should they wish to attend remotely. The public may attend in person or via public streaming at the TAAA [Facebook](#) page.

Inside this issue:

Notes from the President - [Page 2](#)

TAAA News & Activities - [Page 3](#)

Observing Sites and Updates - [Page 8](#)

Equipment for Sale & Loan - [Page 9](#)

Special Interest Groups - [Page 10](#)

Astro Images - [Page 11](#)

Astronomical League Programs - [Page 17](#)

Skyward - By David Levy - [Page 18](#)

Title: SHARK-VIS Ushers In A New Age of Planetary Imaging

Presentation: Since Voyager images in 1979 revealed volcanic activity on Jupiter's moon Io, (the most volcanically active world in our solar system), Io's surface has been monitored by both spacecraft and ground-based telescopes. In his presentation, scientist Al Conrad presents the highest resolution images of Io ever obtained from a ground-based telescope. Taken by the Large Binocular Telescope's new instrument, SHARK-VIS, they show evidence of a recent major resurfacing event on Io, and usher in a new age of planetary imaging by using adaptive optics at optical wavelengths. Scientists hope monitoring Io's eruptions will shed light on the tidal heating mechanism responsible for Io's intense volcanism, and, according to Conrad, "Io, therefore presents a unique opportunity to learn about the mighty eruptions that helped shape the surfaces of the Earth and the moon in their distant pasts."

Biography: Al Conrad, associate staff scientist at the Large Binocular Telescope (LBT) received his PhD in Computer Science from the University of California at Santa Cruz in 1994. Before joining LBT in 2014, he worked as a software engineer and support

astronomer at both Lick and Keck Observatories, then at Max Planck Institute for Astronomy, where he led the development of the adaptive optics system for LINC-NIRVANA (near- infrared imaging instrument). At LBT, Al has served as the point of contact for commissioning of several instruments. His current duties include the science archive, SHARK-NIR (infra-red instrument), SHARK-VIS, and others. His research interests include asteroid systems and developing novel techniques to study comets, planets, and the moons of planets, in particular Jupiter's moon Io. He enjoys cycling, sailing, and outrigger canoe paddling.



Jupiter's moon Io imaged by SHARK-VIS on Jan. 10, 2024

July 2024

The weather definitely is letting us know that it is summer. Before planning to visit TIMPA or CAC for the next couple of months, please be sure to check the schedules for the sites and prior to any astronomy events over the summer make sure to check for any last minute cancellations due to weather.

The Grand Canyon Star Party 2024 was a phenomenal event. All clear nights, fantastic viewing, and lots of wonderful participation on all fronts.

GCSP is our premier, largest event of the year, and we have fantastic support from astronomers, who come from all kinds of locations to share with and be with us during the eight-night event. Not surprisingly, it is a very intense event and we owe tremendous thanks to our 2024 Grand Canyon Star Party Planning Team for all their hard work. There is foundational planning that starts now for next year's event, and throughout the year ideas are developed. An analysis of this year's event with suggestions for next year has already begun with reports from this year's event organizers fully documenting this year's event and results currently in process. Rader Lane, our National Park Service Ranger, prepares a results report that is due in Washington within a month after the event and our key event organizers for this year provide reports on their particular area of work. All of this contributes to keeping the quality of the event, to creating systems of adding new ideas and to considerations of how to keep up with and appropriately adapt to event growth. If you have not turned in a report yet on your activities, do so TODAY as time is almost up to have input integrated into the final national report. If you are interested in participating next year, it is not too early to begin your planning. Check further in this newsletter to also learn about the National Park Service Award that was granted to Dean Ketelsen, founder of GCSP!

As President of TAAA I would like to express my deep appreciation to Rader Lane, our NPS

The TAAA Board of Directors meets the second Wednesday of every month at 6:30pm. Members are welcome to attend Board meetings. If you would like to attend, you may email [Mae Smith](mailto:Mae.Smith@tucsonastronomy.org) to receive a Zoom link for that meeting. Please send your email to Mae the Monday prior to the meeting (by 5:00pm) and you will receive an email with the link on either Tuesday evening or Wednesday. ALL MEMBERS ARE WELCOME.

by Mae Smith

GCSP Ranger, who worked so very hard to prepare the award materials to honor Dean Ketelsen. Rader's support for Dean and for TAAA, and Rader's extensive contributions to the GCSP, and general support of TAAA are immeasurable with extreme behind-the-scenes work that, of course, goes unidentified and, in general, unrecognized. Rader is certainly one of TAAA's heroes.

Summer is a great time for astronomy planning and for some of those activities/projects that are hard to get to. And, it can be a helpful time to organize some activities for the fall. While TAAA activities slow down in summer, we are still here doing things and having meetings and we would love to see you. Remember the July General Meeting is in a different room. Go to the Steward Lobby where we used to have refreshments: the room for the meeting is off the lobby area. See you soon!!

Mae Smith, TAAA President
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Desert Skies Bulletin Editor - David Rossetter Ken Bertschy - Graphics Terri Lappin & Jim Knoll - Proofreading Gregg Ruppel -Image Editor

Ladies' Night Out is a social interest group for women members of the club. The group meets once a month at a restaurant for fellowship and conversation. This month's meeting is:

Thursday, July 18, 6:30pm

Med Cuisine

1763 E Prince Rd

NW corner of N Campbell & E Prince
North on Campbell Shopping Mall

Preview the menu at: <https://medcuisineusa.com/>

RSVP [Susan](#)

Book Of The Month Review

by Douglas Smith (TAAA Librarian)

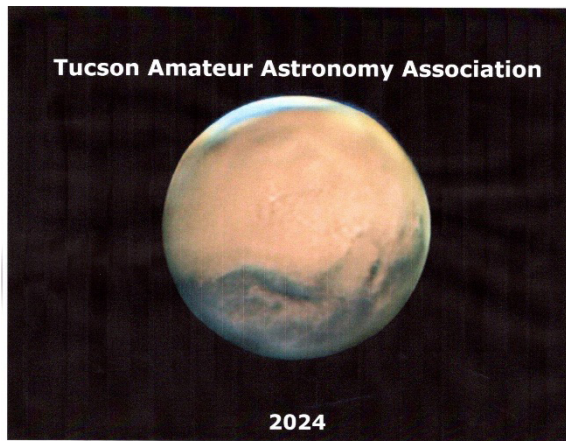
Book: Proving Einstein Right

Authors: S. James Gates Jr. and Cathie Pelletier

After experiencing the two total solar eclipses through North America, I felt this book was appropriately timed to add to our library. It describes the trials and tribulations of the eclipse chasers who chased eclipses in the early 20th century in an effort to measure the effects of Einstein's theory of general relativity during total eclipses.

The book does a nice job of describing the primitive and difficult conditions under which the eclipse chasers had to operate in the remote locations of the eclipses. It also does a good job balancing theory vs. experiment. This was a fun book to read.

This book can be found online for around \$10.



2025 TAAA Wall Calendar

We are looking for your images!

We are especially interested in images from the eclipse; both of the eclipse itself and of spectators who were with you during the event. Also of Comet 12P/Pons-Brooks. Any other images related to astronomy or club events are always welcome.

Please send your calendar images to [Susan OConnor](#).

Astronomical League Workshop

Open for Enrollment

Place: Woods Memorial Library, 3455 N. First Ave. Tucson

Date: Saturday August 24, 2024 **Time:** 10 AM until 1 PM

Synopsis: This workshop is designed for anyone who may be interested in pursuing one of the Astronomical League observing programs for the first time or anyone interested in learning about these observing programs. The workshop will cover how the various observing programs work, program requirements, selection of an appropriate program, recommended equipment, resources, logging requirements, and much more.

If interested: Contact TAAA Astronomical League Correspondent (ALCOR)

Douglas Smith: 520-396-3233, [Email](#)

or sign up using the signup page on the website. There will also be a signup sheet available at the July and August General Member meetings.

Constellation Locating and Identification Workshop

Open for Enrollment

Place: TIMPA

Date: Thursday, September 26, 2024; **Time:** 6:00 PM until completed

Synopsis: This is another workshop in the practical astronomy workshop series. It will teach how to locate and identify constellations. The students will be taught how to locate and identify the constellations without having to memorize the night sky. Each student will use the supplied equipment to locate several constellations. Students will learn how to use a planisphere and star atlas to locate constellations without memorizing the sky. This program provides the methodology for the observing requirements of the Astronomical Leagues Constellation Observing Program (Northern and Southern).

If interested: Contact TAAA Astronomical League Correspondent (ALCOR)

Douglas Smith: 520-396-3233, [Email](#)

PLEASE NOTE: due to equipment limitations there is a strict limit of 20 students for this workshop.

The TAAA Endowment Fund

In 2021 the TAAA board authorized the establishment of the TAAA Endowment Fund. This fund was created to enable contributors to provide support for TAAA's future. The fund accumulates contributions until the balance in the account tops \$10,000, and then the fund will contribute its income to TAAA programs and maintenance.

Today the organization relies on a combination of membership dues, donations and volunteer hours to support its many activities. As time goes on our activities become more costly, and at some point could cause dues increases or restrictions in our activities. A well-funded endowment allows the organization to be protected from the ups and downs of dues and donations, and helps to ensure a steady level of member benefits and work in the community.

The endowment fund is held in a TAAA-owned brokerage account and invested in government securities, U.S. and foreign equities in amounts recommended by the TAAA Investment Committee and approved by the board. The board has appointed the Treasurer Barbara Whitehead, Vice President Ed Foley, and member Paul Koss to the investment committee.

After generous contributions of cash and stock from members the balance of the Endowment Fund is now over \$7,500. Our immediate goal is to exceed a balance of \$10,000 which allows the earnings to be used for TAAA programs. A long term goal of a fund over \$100,000 will create significant contribution to TAAA's activities. If you would like to gift to the Endowment, you can direct your check, online donation, or Zelle gifts by marking them for the 'Endowment Fund'. If you are considering a Legacy gift such as a bequest in a will, you can contact Investment committee members who can guide you in how to best handle this lasting support for TAAA.

Grand Canyon Star Party 2024

by Jim Knoll, Grand Canyon Star Party Coordinator

The **Grand Canyon Star Party (GCSP)** was conducted **June 1 – 8, 2024** (Saturday to Saturday for 8 nights). It was jointly sponsored by



the National Park Service and TAAA. The lead Ranger was Ranger Rader Lane. The Astronomy Staff included Jim Knoll



(Coordinator), Gary Wells (Registrar), Mae Smith (Campground Coordinator), Marilyn Unruh (Social Director), Chuck Schroll (Constellation Tour Coordinator), and Susan Knoll (Star Guide Coordinator). Additional planning team members included Bernie Stinger and Don Cain. The team met monthly on zoom beginning January 2024 to plan the event.

Registration was opened early March. Member Planet was used for the overall registration forms and for the Campground application. All the volunteer forms were on the TAAA GCSP Webpage for astronomers to download and read. Gary Wells organized and managed the registrations for the overall star party and any campground applications were organized and monitored by Mae Smith. We had about 100 astronomers participating with an average of 51 telescopes each night throughout the event (high was Tuesday/Wednesday June 4/5 with 58 and low was Monday June 3 with 40). Exact astronomer count will be collated by Rader Lane in the next month as we did have several that did not register in advance. We averaged about 1,100 visitors each night to the telescopes and around 600 at each talk (held outside in the Visitor Center Plaza). Weather was good for most nights with only one night that we

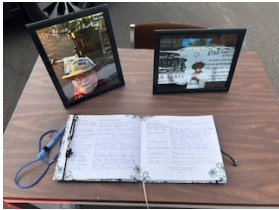


had some issues with extensive clouds. It was windy most evenings and very cool during the early portion but warmer during the latter nights. We had a nightly meeting at 7 pm to review any changes and go over the night's events. A talk was held at 8 pm each night and a telescope donated by Sky Watcher USA was raffled to a youth between 8 and 15 years old. Observing was from about



8:30 pm after sunset and went until 11:15 pm. Astronomers were allowed to drive on the lot from 11:15 to midnight to breakdown any equipment if needed. Star Guides interacted with visitors to efficiently guide them through the lot.

This GCSP was dedicated to Dean Ketelsen. A memorial table was set up in Dean's usual telescope spot with a couple pictures of Dean, a banner indicating the timeframe of the GCSP (1990-2023), Dean's birth/death dates, and a memorial book for astronomers to write memories of Dean. These items will be mailed to the family this summer. Dean's extended family attended the first two nights of GCSP and were moved by the extent of GCSP and the wonderful outreach provided. This year's T-Shirt was a tribute to Dean Ketelsen and was sold throughout the event to participating astronomers. The design was made by Joe Bergeron and Mae Smith oversaw the sale of the T-Shirts during the event. Dean was nominated and posthumously awarded the National Park Service **Regional Excellence in Volunteerism Award**. During a meeting with NPS leadership during GCSP, we learned that Dean was also the **NATIONAL Award Winner**, and the family will be presented with that award in August in Washington DC. This is an extreme honor with only one national volunteer each year.



Social events throughout the week included a welcoming Pizza Party the first Sunday with the Pizza purchased by TAAA, Pizza/Pasta lunch and a trip to IMAX in Tusayan on Tuesday, Huevos Rancheros Potluck for breakfast on Thursday, and a final gathering on Saturday at the Campground with lunch catered and provided by the Grand Canyon Conservancy.

A post-event survey will be sent to participants in June to gather any inputs for future events. The Planning Team will then meet to review those inputs and set the timetable for planning the 2025 GCSP, which will be held June 21-28, 2025.



Observing Sites

TIMPA

by TIMPA Planning Group

TIMPA (Tucson International Modelplex Park Association), TAAA's dark sky site west of the Tucson Mountains. Location: The TIMPA observing site is located a few miles beyond the Desert Museum (3250 N. Reservation Road, Tucson, AZ 85743).

TIMPA Star Party Dates this month **Tentative - Monsoon:**
July 5-6

The TIMPA Planning Group will be offering assistance with telescope usage and observing during the monthly TIMPA Star Parties. You are invited to bring your equipment and questions to TIMPA on Star Party dates for assistance. Be sure to register using the link below.



The TIMPA site is only partially improved. There are no inside buildings provided other than restrooms. TAAA provides very limited seating (members are welcome to bring folding chairs). Please note that members visiting the TIMPA site may encounter things commonly found in partially improved desert areas such as desert creatures and/or their remnants (such as gopher holes or ant hills), uneven terrain, weeds, and desert pollens. Members using the site are encouraged to bring red lights and to move cautiously taking appropriate safety measures. The site does not have potable water, so bring your own non-alcoholic drinks.

Reservations for the TIMPA Site are made on the TAAA website at [TIMPA DARK SITE RESERVATIONS](#). Please fill out the form completely and be sure to indicate the date you desire to visit TIMPA.

Chiricahua Astronomy Complex

by Jim Knoll

Upcoming CAC Weekend Dates (Fri/Sat): **July 5-6 (New Moon 5)**

Over Monsoon, the site will be open for the above member nights, but confirm when making a reservation if you are not checked out to open and close the site.

Chiricahua Astronomy Complex (CAC) is the club's dark sky observing site, located in Cochise County approximately 100 miles southeast of the center of Tucson. If you would like to attend, you must make a reservation on the CAC Web page at [CAC Reservations](#).



Unless you are qualified to open and close the site, dates will be limited to those around the New Moon and are listed on the CAC web page. Hosted personnel are generally on site a few days before and after these dates. Those qualified to open & close the site can use it anytime but still need to reserve through the CAC Reservations process.

Observing Sites Star Party Dates 2024

TIMPA

July 5-6*

August 30-31* August 2-3*

* **Tentative - Monsoon**

Sept. 27-28 November 1-2

Nov. 29-30 December 27-28

CAC

July 5-6 (New Moon 5) *

August 2-3 (New Moon 4) *

August 30-31 (New Moon Sep 2) *

* **Monsoon Dates - no hosts available**

September 21 - Evening Under the

Stars - Public Event

September 27-28 (New Moon Oct 2)

November 1-2 (New Moon 1)

November 29-30 (New Moon 30)

December 27-28 (New Moon 30)

TAAA Astronomy Equipment For Sale

TAAA has an assortment of astronomy related equipment for sale. This equipment is available for members only at this time.



Celestron 8" XLT with NexStar. Comes with a couple of eyepieces, barlow, red dot finder, instruction manuals.
\$1000



Skywatcher 10" Dobsonian Comes with rack and pinion focuser (2" or 1.25"), 8x50 finder and 10" full aperture white light solar filter, instruction manual.
\$600



Meade ETX60 Refractor with AutostarExtra keypad, instruction manual. **\$75**

STEAL OF THE MONTH!
12" Dobsonian - NO IMAGE.
Very large, Homemade. Crosshair finder.
\$500

We also have an assortment of other items available at this time including: Finder rings, focusers, telescope rings of various sizes, mirror blanks of many sizes, a 6 inch Newtonian mirror set mounted in cells, several large mirrors and more.

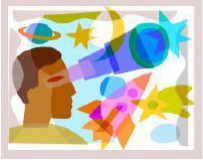
To make inquiries about what is available or to express a desire to purchase one of items please contact: [Douglas Smith](#); 520-396-3233

TAAA Equipment Loaner Program

The TAAA has a terrific Equipment Loaner Program. This gives you access to fine telescopes including computerized Schmitt Cassegrains from Meade and Celestron, Dobsonians from Orion, mounts, tripods, and cases full of fine eyepieces. Check out the [full list](#) with descriptions and photos.

This equipment is for TAAA members to checkout and use. Email [Ralph Means](#) for information or to schedule time for pick up.

Special Interest Groups



Starry Messengers Special Interest Group

Opening Minds to the Universe

Starry Messengers SIG is taking the summer off. **Next meeting will be September 9th.**

Astronomy Fundamentals SIG

by Connor Justice

Come join us for a presentation from the fundamentals of amateur astronomy. Learn your way around the night sky to add to your observing enjoyment. Meetings are on the second Thursday of each month.

The next AFSIG meeting is on **Thursday, July 11, 6:30pm to 8:30pm.** Topics to be determined.

Contact [Connor Justice](#) for Zoom link and more information.

Access videos of previous meetings in the TAAA's [YouTube Channel](#) [AFSIG on the Web](#)

Astro-Imaging SIG

by Gregg Ruppel

The next AISIG meeting will be **Monday, July 15 at 7:00 pm** via ZOOM.

Topics:

Beginners' Corner - Ask A Question

Understanding How Camera Specs Affect Your Images - Doug Summers

Monsoon Challenge 2024 - Share Your Images

Email [Gregg Ruppel](#) for the ZOOM link or any other information. Gregg and the AISIG folks are very active on the [TAAA groups.io](#) forum. Check out all the helpful advice and amazing images there. For more information or instructions on how to join the forum, [check here](#).

Look for previous AISIG meetings on the [TAAA YouTube Channel](#).

Check out AISIG's new [Web Pages!](#) We've refreshed our landing page with current meeting info, fresh images and links for our Members Gallery, and are rolling out a new mentoring program.

Highlights from the Astro-Imaging SIG



M51
(GCSP)
[Astrobin](#)

This seemed to be a really popular image with the public, so I shot quite a bit of it while live stacking with AA+. I wanted to shoot it again anyway as the last time I did it was some 9 years ago when I was still using a DSLR and didn't have Pixinsight. I had to crop this quite a bit as my travel scope is a RASA8, rather wide field.

Allen Force



**Comet
c2023 A3
Tsuchinshan-
ATLAS**
(GCSP)
[Astrobin](#)



M106 [Astrobin](#)

David Stearn

[Astrobin](#) M27





Abell 2065 Galaxy cluster [Astrobin](#)

Jeff Rothstein

[Astrobin](#) Sh2-101 Tulip Nebula





Alan Rockowitz

NGC 2841; 2 hours of LRGB data

NGC 6951

This is about 16 hours of LRGB data, comprised of about 700 subs, varying between 60 and 120 seconds. This was imaged using my 5.5" refractor on my 10 micron mount from my backyard in town--no filters other than the LRGB filters were used.





**Comet c2023 A3
Tsuchinshan-
ATLAS**

Imaged with eVscope.

Rik Hill

2024-04-28-0407UT
16m exp
eVscope eQuinox1
Seeing: 8/10

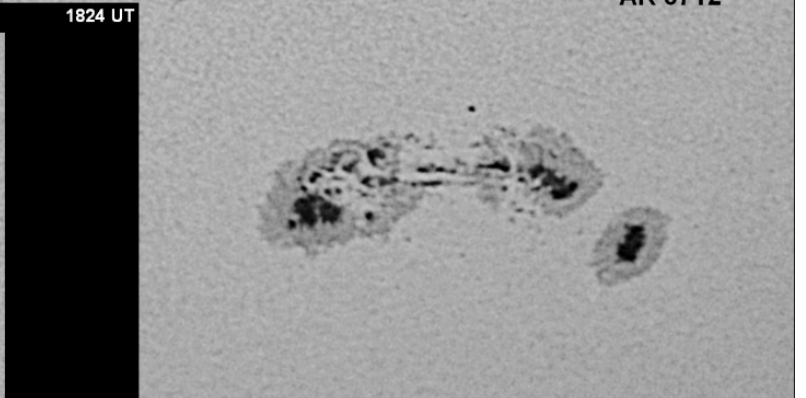
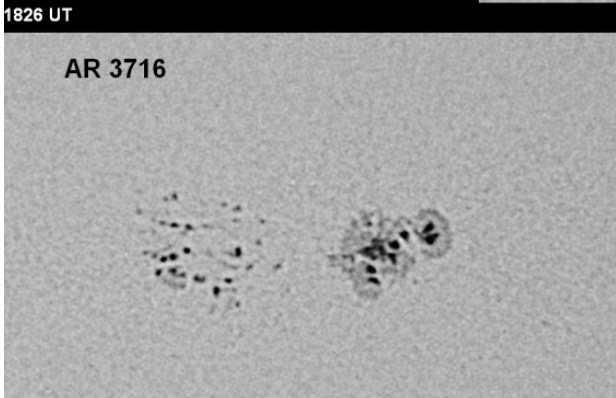
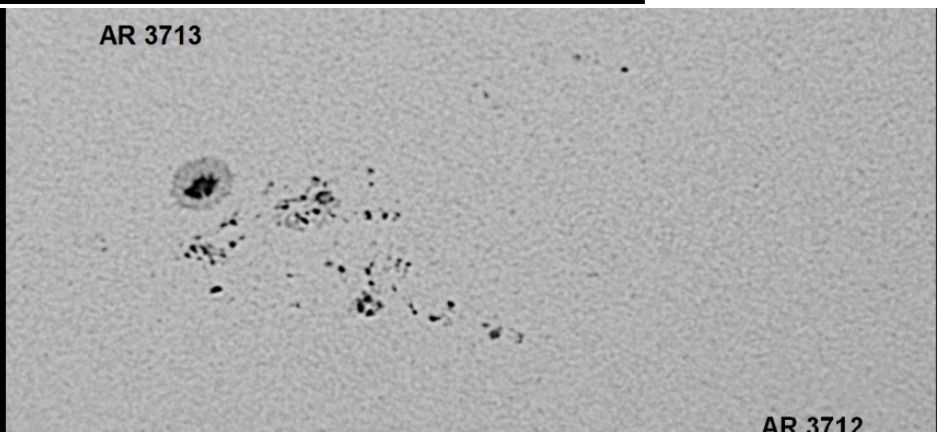
Richard "Rik" Hill ©2024
Loudon Obs., Tucson
rhill24@cox.net

Sunspot groups

Sun in White Light
2024-06-18-1828 UT
Seeing 8/10 gusty winds 100F
Dynamax6 + 3.8 filter
Cam: Skyris 236M
Carrington Rotation 2285
L= 147.4° B= -1.5° P= -8.0°
north up

AR Locat Area Z Mag
3712 S26W26 1150 Ekc 40 Beta-Gamma-Delta
3713 S16W13 0170 Esi 20 Beta-Gamma
3716 N10W19 0310 Dki 24 Beta-Gamma

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Loudon Obs., Tucson, AZ
rhill24@cox.net





**Arp 117
& 79**

Near brilliant Arcturus, this field contains two Arps. Arp 117 consists of the 12.5 mag face-on SB spiral IC983 with close companion SA0 IC982 at mag 14.0. The pair falls in Arp classification "Elliptical close to and perturbing spirals".
 RC8" f/8 / zwo2600mc pro / CEM70ec / Askar OAG/174mm minicam guided PhD2 / 5.3hrs exposure / no filters / scale 0.48"/px.

Tom Eby

NGC 3987 Field

A field populated with many galaxies, most of the NGC objects are in the 230-250 million LY range, the smaller background galaxies range from 500 MLY to 1.9 GLY. RC10" f/8 / zwo 2400mc Pro, 0.61"/px scale / AP Mach2 GTO unguided (DecArc model used) / 4.75hr exposure / no filters.



What's Up list for July 2024 – August 2024

Fellow amateur astronomers. Many of the Astronomical League observing programs can be done from our backyards. The following is a list of objects visible in July and August for the more common observing programs.

Constellation Hunter Program – Northern Sky

The following Northern Constellations are well placed for viewing during July and August:

Aquila, Bootes, Corona Borealis, Draco, Hercules, Lyra, Sagitta, Serpens Caput, Serpens Cauda, Ursa Minor, Vulpecula

Messier Observing Program - The following Messier objects are well placed for viewing during July and August (listed in ascending RA): M5, M80, M4, M107, M13, M12, M10, M62, M19, M92, M9, M14, M6, M7, M23

Lunar and Binocular Observing Program

The following is a list of dates for the lunar phase for July and August:

New Moon: July 5, August 4	10 days old: July 16, August 15
40 Hours waxing: July 7, August 6	Full (14 days old): July 21, August 19
72 hours waxing: July 8, August 7	Gibbous: July 28, August 26
4 days old: July 10, August 8	72 hours waning: July 2, August 1
7 days old: July 13, August 12	40 hours waning: July 3, August 2

Solar System Observing Program

The following list describes the solar system objects and their visibility during July and August:

Mercury is an early morning object during July and the first half August. It becomes an early evening object during the last two weeks of August.

Venus is an early evening object during July and August. It sets about 30 minutes after sunrise on July 1. It sets a little later each day July and August so that on August 30 it sets about 1 hour after sunset.

Mars is a late evening object during July and August. It rises around 1:30 AM on July 1. On August 30 it rises around 11:30 PM.

Jupiter is a late evening object during July and August. On July 1 it rises around 2:30 AM. On August 30 it rises around 11 PM.

Saturn is now well positioned for evening viewing. During July and August it rises in the early evening. On July 1 it rises around 11 PM. By end of August it rises around 30 minutes after sunset, transiting around just after midnight.

Uranus is a late evening object in July and August, rising earlier each day. It rises around 1:30 AM. On August 30 it rises around 9:30 PM.

Neptune is an evening object in July and August. It rises around 11:30 PM on July 1 and around 7:30 PM on August 30.

Urban Observing Program

The following **deep sky objects** are well placed for observing during July and August: M5, M4, M13, NGC 6210, M12, M10, M62, M92, M6, IC 4665, M7

The following **Double Star** is well placed during July and August: Beta Scorpius

Skyward

By Dr. David H. Levy

July 2024

The wonderful visit of Olbers's Comet.

On Tuesday, June 4, 2024, David Rossetter and I headed out for our monthly observing session at the Chiricahua Astronomy Complex, the dark site of the Tucson Amateur Astronomy Association. In addition to the normal two hours of comet searching I did that evening, David located Comet Tsuchinshan-ATLAS, a bright 10th magnitude comet with a pretty dust tail. I wish I had paid more attention that evening to the other comets that would be visible that night. If I had been more careful, I would have noticed that Comet Olbers was returning for the first time since 1956. There is no way I would have seen this comet then since I was only eight years old at the time. Since it was already pretty bright, I tried to locate it from my observatory on the following Friday evening. But the comet's position low in the northwest made that impossible.

On Saturday evening I tried it again from my front porch which does have an excellent view to the northwest but is looking over Tucson. I used a brand-new 6-inch diameter telescope from the Sky-Watcher company. This new telescope, presented to me by Dean Koenig of Starizona, was destined to go to Robin Chapell. Robin has been cleaning my home for many years, first for Wendee and me, and more recently just me, and a few weeks ago she expressed an interest in getting a telescope. To test the new telescope, I tried to use it to find Comet Olbers. I didn't catch it Saturday or Sunday evening, although I might have gone right over it Sunday without spotting it.

On Monday, June 10, I drove to David and Pamela Rossetter's home to find him setting up Archimedes, his 12-inch reflector, in his driveway, which had an excellent view to the northwest except for a Palo Verde tree. After carefully aligning the 12-inch telescope on Polaris, then Spica, then Pollux and finally Castor, he put in the comet's position and moved the telescope. Lo, the comet was in the middle of the tree! David looked anyway and saw two faint stars in the telescope's field.

Toward the left of one of the stars, he detected a faint fuzzy spot. Then it was my turn. Immediately I also detected the fuzzy spot. It was real. For the first time in both our lives, we saw Comet Olbers. Pam joined us for a brief visit.



Comet Olbers. Photo by Dr. Tim Hunter

Heinrich Olbers discovered this comet on March 6, 1815. The comet is named for him as 13P/Olbers. But the comet is not what he is famous for. His magnum opus is Olbers' Paradox. In 1823 he proposed that with stars spread out to infinity in the sky, there should be no point in the sky that does not fall upon the surface of a distant star. Olbers then suggested that because of this, every inch of sky should be as bright as the Sun. The Nobel prize-winning physicist George Wald went further a few decades ago, adding that the sky should be so bright that life on Earth would be impossible. "But the night sky is dark; therefore, life here is possible."

One would expect that some famous scientist was the first person to resolve Olbers's Paradox. Not quite. An American writer famous for his poetry and short stories, Edgar Allan Poe is one of the truly great American writers. His poem *The Raven*, written in 1845, is one of the world's most famous pieces of literature, brought to life when two ravens adopted Gene and Carolyn Shoemaker, who dutifully named them *Never* and *More*:

Presently my soul grew stronger; hesitating then no longer,
"Sir," said I, "or Madam, truly your forgiveness I implore;
But the fact is I was napping, and so gently you came rapping,
And so faintly you came tapping, tapping at my chamber door,
That I scarce was sure I heard you"—here I opened wide the door;—
Darkness there, and nothing more.

Deep into that darkness peering, long I stood there wondering, fearing,
Doubting, dreaming dreams no mortal ever dared to dream before;
But the silence was unbroken, and the darkness gave no token,
And the only word there spoken was the whispered word, "Lenore!"
This I whispered, and an echo murmured back the word, "Lenore!"
Merely this and nothing more.

...

Then this ebony bird beguiling my sad fancy into smiling,
By the grave and stern decorum of the countenance it wore,
"Though thy crest be shorn and shaven, thou," I said, "art sure no craven,
Ghastly grim and ancient Raven wandering from the Nightly shore,—Tell me what thy lordly
name is on the Night's Plutonian shore!"
Quoth the Raven, "Nevermore."

As delightful as *The Raven* is, and as often as the word darkness appears in it, the poem does not explain why the night sky is dark. But three years later, Poe's final major piece of writing, "Eureka", solves the paradox perfectly:

"Were the succession of stars endless, then the background of the sky would present us an uniform luminosity, like that displayed by the Galaxy—since there could be absolutely no point, in all that background, at which would not exist a star. The only mode, therefore, in which, under such a state of affairs, we could comprehend the voids which our telescopes find in innumerable directions, would be by supposing the distance of the invisible background so immense that no ray from it has yet been able to reach us at all."

That this is correct was not really confirmed until Edwin Hubble described the expanding universe around 1929, and these observations were confirmed by modern work by the Hubble and Webb Space Telescopes.

It is a simple, beautiful, and even loving sentence. "The night sky is dark; therefore life is possible on Earth." And on one lovely evening during that life, I got to enjoy the little comet he found, and which was paying us a welcoming visit from the outer reaches of the solar system where our lives transpire.



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