



Saguaro Astronomy Club, Phoenix, AZ

Volume 46, Issue 4
April 2022

The President's Corner

mail to: president@saguaroastro.org

Ha, Ha, the jokes on you! You missed it, or at least most of you did. What am I talking about? The SAC 2022 Messier Marathon. Yea, yea, yea, you saved a little gas money and stayed cooler than we did, BUT, despite the forecast we had clear skies until Sunday morning late.

I got out there Thursday afternoon, as did the port-a-lets, all the comforts of home. I had one other intrepid stargazer show up that afternoon too. Skies were clear that night and the heat of the day ensured a mild viewing night.

Friday was hotter, but we had shade structures. We, SAC members, may want to invest in new ones though, as the cover for one was missing and the other collapsed in the moderate wind of Saturday afternoon. We were joined by another stargazer that afternoon and visited by Air Force jets on their way to the Barry Goldwater range to the south. I even saw one of the stealth fighters, although I could see it plainly, how stealth is that?! Friday was pretty cloudy too, but by 8 pm clear and another mild night of shirtsleeve viewing.

Then the big day, Saturday. People trickled in starting about noon. There was even a first for me and I bet the marathon: we had a tractor trailer bobtail drive onto the site and the driver ask if this was the location of the Messier Marathon. He was an amateur from Montreal Canada, accent and all. When he got ready, he pulled out a nice telescope from his truck and joined the crowd that night hunting for objects.

Non-attendees also missed a really nice raffle, with all sorts of items going pretty easily. We only had between 16 and 18 attendees, I failed to get a good count. So it did not take much of an investment to practically guarantee a winning ticket. Steve Rottas did not make the event but gave money for the raffle and won a number of books (I hope he likes what I picked out for him) and, he won the grand prize, a very nice pair of

Orion binoculars with a tripod and counterbalanced arm for holding the binoculars.

Saturday was hot and cloudy, but like Friday night, it cleared off and was great viewing until early Sunday morning. Not many attendees turned in their list of objects seen, but one of the last said he was fighting clouds when he thought he saw the last object. Good for him! (I'd gone to bed about 2 am when my back gave out, but even I had a great time logging lots of the objects.)

So, you see, you did miss a great time! Like winter, I will look forward to next year's marathon. I hope you do too and show up. Thanks to all who did show up. Clear skies all.

Tom Curry,
SAC President



Photo: Susan Trask

SAC on Facebook: **NOW INACTIVE**
<https://www.facebook.com/groups/420992487938402/>
SAC is looking for a new Facebook moderator!
Contact the SAC editor if interested.



Inside this issue:

* [Click Links to jump](#)

Editor Notes, Events 2
Call for Observations (Rick Rotramel)

Best of the NGC: 3-4
NGC 3941, Galaxy in Ursa Major (SAC Imagers & Observers)

Such-A-Deal: 5-7
 Four old ads.

Bits & Pisces
SAC Meeting Minutes 8
SAC Nominations/Elections 9

SAC History 10
 Saguaro Astronomy Club History, Part 3
 ©2021. By Former SAC President Fred Tretta

SAC Observing
 All Arizona Messier Marathon 11-12
 The Astronomical Calendar, 2022 13-15
 ©2021 By Guy Ottewill

SAC Outreach 16
 Grand Canyon Star Party, North Rim

SAC Sky 17

SAC Officers/Chairs 18
 (Board Meetings, Meeting Location & Occultation Info)

SAC Membership Form 19
 With PayPal Link
 (Via the SAC website)

Header image © 2000-2013 Stellarium Developers
 Scorpius setting in the southwest.

Quick Calendar

The April 8th SAC meeting is an "In Person" meeting at the Glendale Main Library, 6:00 PM 5959 W. Brown St, Glendale, AZ (59th Ave, between Olive & Peoria Avenues, west side of street)

* An email will be sent notifying you where the meeting will take place.

Editor's Note: SAC's General Meetings are also still on Zoom, (Virtual, online) Meetings. An email was sent to all the members and friends of SAC to announce the date of the Zoom Virtual Meeting with a link to register to join. The next Zoom SAC Meeting is: April 8th

*Guest Speaker: Robert Buchheim
 Topic: "Evidence of Things Not Seen"*

*** If you have not received an invitation for the Zoom meeting, contact Tom Curry, SAC President.**



[Click here to return to page 1](#)

Editor Notes



Hi Folks,

Best of the NGC features this month NGC 3941, a galaxy in Ursa Major.

Such-A-Deal has four old ads, check them out.

Bits & Pisces has the March 11th SAC meeting minutes, the duties listed of three open SAC officers for the 2022 elections, volunteer!

SAC History has history bits from Fred Tretta.

SAC Observing has *results* of the All Arizona Messier Marathon, held on Saturday, March 26th and has sky info for the month.

SAC Sky has info on the moon and planet locations this month for you all.

Remember to attend, if you can, the "in person" April 8th SAC meeting or register and tune-in to the Zoom online general SAC meeting.

Enjoy.

Rick Rotramel, Editor



2022 SAC Officers Photo by Susan Trask

Call for *Best of the NGC* images, notes and sketches.

For **May**, NGC 4567, Sb, 12 36.6, +11 16, 12.5 mag, 3.0x2.5, in Virgo, Siamese Twins.

For submitting images, send your file as an attachment in an email to the editor. Please send caption details of the image: Optics, camera, main software used, exposure, location and date taken.

Observation notes are sent in the email text area or as an attached file.

For scanned sketches, send a file with caption details: optics and eyepiece power used.

Email to: r.rotramel@cox.net

For **June**, NGC 4699, Sa, 12 49.1, -08 40, 10.5 mag, 3.5x2.7, small & bright, in Virgo.

For **July**, NGC 4026, E8, 11 59.4, +50 58, 11.5 mag, 4.5x1.1, lens-shaped, in Ursa Major.

Schedule of Events 2022

SAC General Meetings

Jan. 14 plus Board mtg.	Feb. 11	Mar. 11	April 8
May 13	June 10	July 8 plus Board Mtg.	Aug. 12
Sept. 9	Oct. 14 plus Board Mtg	Nov. 4 Elections	

Meetings held at the Glendale Main Library, 5959 W. Brown St, Glendale, AZ (59th Ave, between Olive and Peoria Avenues, west side of street)

New meeting time: 6:00 to 8:00 PM

Due to COVID-19, Monthly SAC Meetings *still* take place virtually online via Zoom. You will receive an email when the next meeting will be, with a link to register and to join the meeting online at Zoom.

View video recordings of the Zoom meetings here:

<https://www.youtube.com/channel/UCEKTF10gwebABZXwKbhe9oA>

ATM/Astro Imaging Meeting

Every Tuesday, @ Paul Lind's Shop
210 W. Tierra Buena Ln, Phoenix, AZ, cell: 602-350-6190

Grand Canyon Star Party, North Rim

Saturday/Saturday, June 18-25, 2022

<https://www.saguaroastro.org/grand-canyon-star-party/>

2022 SAC Officers

President: Tom Curry



Treasurer: Jack Jones

Vice President: Open position
Secretary: Open Position
Properties Director: Open Position

Photos: Susan Trask

SAC Announcement

Attention SAC Members:

SAC 2022 Renewals Are Due Now.
Use the form on the last page of this issue.
Or, use PayPal on the SAC website.



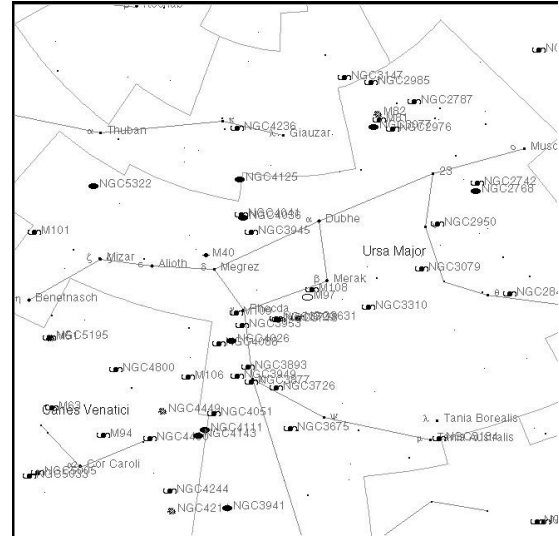
Best of the NGC:

NGC 3941, Galaxy in Ursa Major

By SAC Imagers, Observers & Sketchers



Guest Image: The Sloan Digital Sky Survey

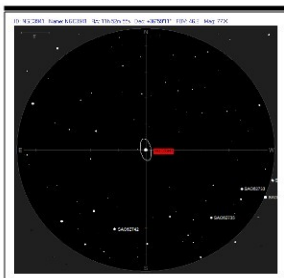


Ursa Major Star Chart

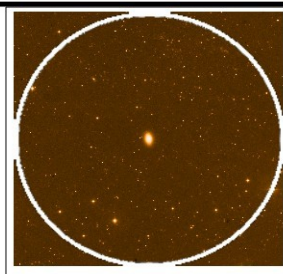
Observing Chart
D. M. Douglass - Tempe, AZ 05/2011

NGC 3941

Observed and Imaged
Date: Jun 21, 2011
Site: Datil, NM



Astro Planner 46 Arc Min
Eyepiece Projection



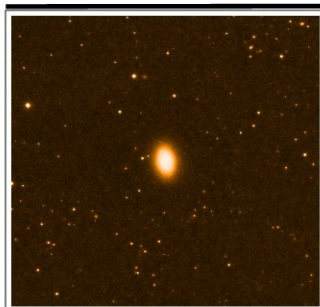
ESO Palomar Sky Survey
46 Arc Min Projection

Type: Galaxy
R.A. 11:52:54
Dec 36:59
Magnitude: 11.0
Size: 3.8 Arc Min
Distance: n/a Light Years

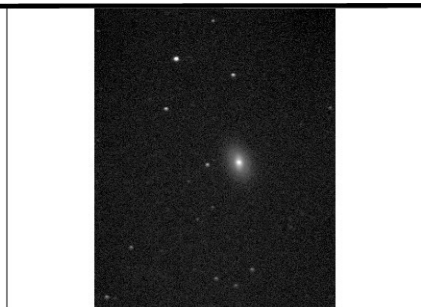
Observing Programs:
EVAC 200
Herschel 400

Constellation: Ursa Major

Telescope:
LX200 rGPS 8" SCT
26 mm -60 Degree Eye Piece
.78 Deg FOV or 46 Arc Min
Mag (eye piece): (2000/26) 77
Mag (DSI 3): (2000/11) 182



ESO Palomar Sky Survey
20 Arc Min (DSI) Projection



Final DSI-3 Image
Approx 14 x 18 Arc Min

Sky Brightness
Mags / sq ArcSec (v)
21.7 or
Bortle Scale: 3

Estimated Seeing
(Ursa Min) 6.6

Weather:
Temps.. 50-60
Wind.. Calm
Clouds.. None



Best of the NGC:

NGC 3941, Galaxy in Ursa Major

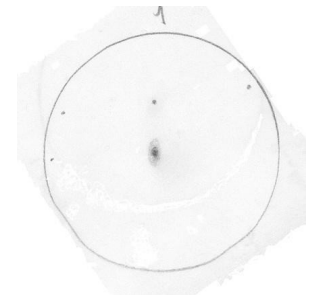
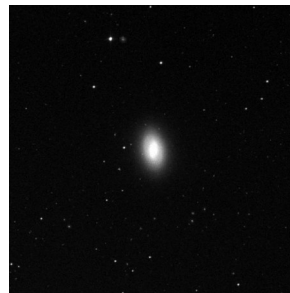
By SAC Imagers, Observers & Sketchers

SAC Observer Steve Coe, 1949-2018

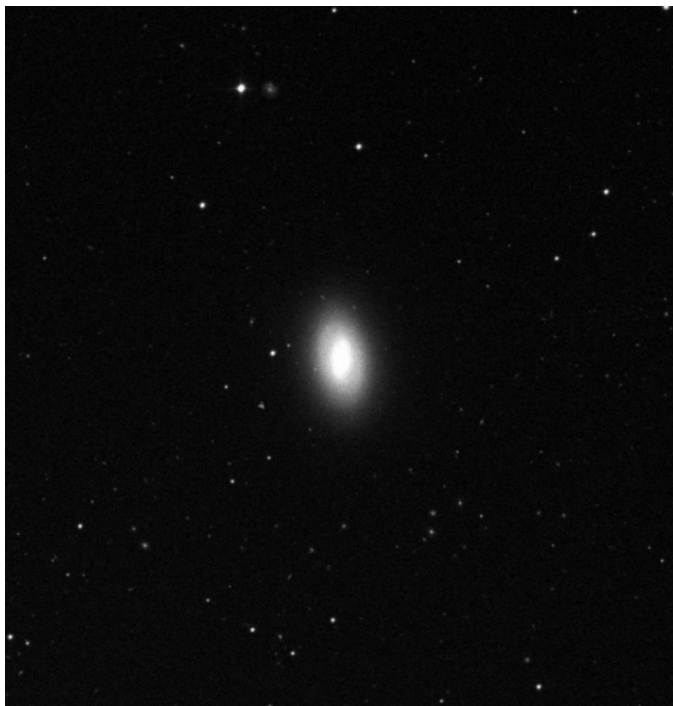
13" f/5.6; Bright, pretty large, round and much brighter in the middle at 165X. Averted vision helps on this mottled galaxy.

SAC Observer Rick Rotramel

16" f/4.4 Newtonian, 200x; Pretty bright, pretty small, oval shape, much brighter in the middle.



16" f/4.4, 200x



Such-A-Deal

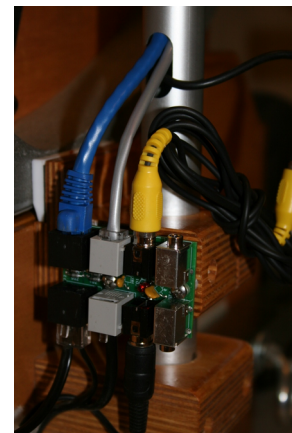
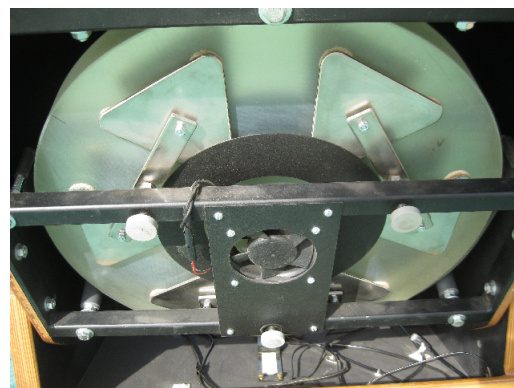
Obsession Reflector Telescope, 20" f/5

- Obsession reflector telescope, 20" f/5
- w/ArgoNavis DSC guidance system
- ServoCat motorized drive
- Gen-2 black-case
- Stalk, shroud, light shield
- Powered ground board
- Remote GOTO button
- Kevlar sling
- 3-filter slider
- ServoCat bracket, Static Protection Board
- Telrad and base
- AstroSystems pole bag, UTA cage bag
- Mirror fan, mirror cover
- Wheelie bars
- SSI prot. board, upgraded Gen-3 keypad

Asking \$5500

Jack Jones

Email: telescoper1@gmail.com



Ads placed here are free to SAC members and friends. SAC is not responsible for the quality of the advertised items. If you wish to place an ad here to sell your telescope or astronomy related items, contact Rick Rotramel at: r.rotamel@cox.net

Such-A-Deal

Soft Case for a Meade 10" SCT

- I have a Meade soft case for the 10 inch LX200 for sale. I think it will work for both the Classic and GPS. It contains form-cut foam interior for telescope protection. It is in like new condition. I would like \$50. Email me if interested, I live in North Glendale.

Asking \$50
Ray Vorbeck

Email:
rvorbeck@msn.com



Ads placed here are free to SAC members and friends. SAC is not responsible for the quality of the advertised items. If you wish to place an ad here to sell your telescope or astronomy related items, contact Rick Rotramel at: r.rotamel@cox.net

Telescope Equipment For Sale

- Celestron C11 Carbon Fiber OTA, Fastar, with Losmandy rail; **\$1200**
- Celestron CI-700 mount/tripod, with AAM encoders and Sky Commander controller - Tracks beautifully **\$750**
- Hyperstar V3 for C11, virtually unused **\$750**
- Celestron (Vixen) C6, 6" f5 newtonian - Original Vixen sled focuser, OTA only **\$150**

Televue Eyepieces:

- Nagler Zoom (3-6) **\$325**
- Nagler 7mm 7T1 **\$160**
- Nagler 12mm 12T4 **\$285**
- Nagler 20mm 20T5 **\$300**
- Panoptic 27mm **\$275**
- Numerous classic Japanese achromats from '50s/60s/70s (several are very nice, high-quality specimens)

Detailed photos available on request. Please feel free to inquire for additional detail or information. All prices are subject to reasonable negotiation.

Darrell (480) 363-9463
Email: darrellspencer10@gmail.com

Meade ETX-90EC Telescope

The Meade ETX-90EC portable telescope with 90mm Maksutov-Cassegrain optics, built-in flip mirror mechanism, and an f/13.8 focal ratio produces celestial objects with clarity and detail. Includes the following:

- AutoStar Suite Planetarium software allows total computer control of the mount and telescope, and access to a database of over 30,000 celestial objects. Weight is less than ten pounds, so telescope is lightweight & easy to transport.
- Meade electronic controller with attached coil cord.
- Deluxe field tripod.
- Hard carrying case for ETX-90EC with specific compartments.
- In addition to attached finder scope a QuickFinder device is attached too.
- Eyepieces include: Meade 45' erecting prism, Super Plossl 26mm LP, Meade 2X Teleneegative Multi-coated, LV6mm-45 degree Long Eye Relief 20mm, LV10mm-50 degree Long Eye Relief 20mm, LV15mm-50 degree Long Eye Relief 20mm. Hardly used, excellent condition.

Price \$350.00. If interested, please contact: Den Krasavage rkrasavage@cox.net or home phone# (602) 277-1193



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Such-A-Deal

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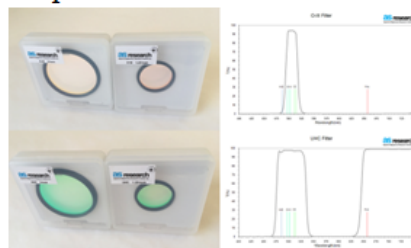
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Overgaard, Arizona

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Telescope
in
Arizona



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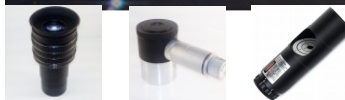
www.Apache-Sitgreaves.org

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Telescope Accessories

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The HyperStar-equipped ISERV telescope is now installed on the ISS!

The HyperStar-equipped Celestron 9.25" telescope (and its backup) that is now installed on the ISS. The scope also features a Starizona MicroTouch Autofocuser. With the Starizona gang: Steve, Scott, Dean, and Donna. (Steve has since had to move to NY because he was dressing too much like Scott.)

Call Us: (520) 292-5010

<http://starizona.com/acb/index.aspx>
dean@starizona.com



Bits & Pisces

Minutes of the March 11, 2022 SAC General Meeting

By Rick Rotramel

The meeting was called to order on March 11, 2022 at 6:26 pm by SAC President Tom Curry, after about 26 minutes of technical difficulties setting up for the Zoom presentation at the new "in person" meeting location at the Glendale Main Library. There were 16 attending in person and 13 watching on Zoom.

Tom announced that David Douglass has volunteered to be the SAC webmaster, taking over for Robert Brewington, who had been webmaster for about four years. The SAC website will be updated by David.

Tom then announced that the *All Arizona Messier Marathon* will happen Saturday, March 26th at the *Antennas* star party site. Two porta-johns with a hand wash station has been ordered for the site. The blinking white bright lite on one of the antennas still has not been changed to red, so be aware, imagers. Guest speaker, Kevin Schindler donated a set of the Robert Burnham Jr. classic three-volume Burnham's Celestial Handbook, for the Raffle at the Messier Marathon.

Member presentations:

Paul Lind commented as he presented his video on "Parabolizing 101" of a 6" f/5 mirror with a focal length of 30 inches. He described the mirror being polished with "w" strokes, changing a spherical mirror to a parabolic mirror. He showed photos of Matt Luttinen and Joe Goss polishing the mirror for a half hour. On the test stand, Paul measured 1/4 wave peak error, 1/13 rms error, and slightly under corrected. He decided to leave it at that.

SAC Treasurer Report, Jack Jones: Jack reported a balance of \$3542.74 and \$81 cash on hand, March 1st.

The March Guest Speaker:

Kevin Schindler, Historian,
Public Information Officer,
Lowell Observatory
Topics: "The Life of Robert Burnham Jr."
+ "A Lowell Observatory Update"



Photo: © Kevin Schindler

Our Guest Speaker tonight: Kevin Schindler, spoke of the life of Robert Burnham Jr. His hobbies, his being hired to work on the "Proper Motion Project" at Lowell, with the 13" Pluto telescope. He discovered comets. As an amateur astronomer, he observed all the objects in the sky and wrote the classic three volume set of books, the "Celestial Handbook" on a typewriter, and assembled in three loose leaf binders by hand with the help of friends and family.

Kevin also spoke of the goings on at Lowell: Virtual Star parties on line, a Messier Marathon tonight, a Robert Burnham Jr. visitor center display being created, several "16 video camera array meteor monitors" at several telescope sites, a new three story public Astronomy Discovery Center to open in 2024, a new 24" Plane Wave telescope in a dome, to name a few. The observatory is now open to the public, after being closed to the public on March 13, 2020 due to the Covid-19 pandemic.

The meeting adjourned at 7:50 pm, the new time (8 pm) for this meeting location. Attendance was 29.



Bits & Pisces

Open Nominations/Election for SAC 2022 Officers During the SAC Zoom Meeting

Excerpts from the SAC Constitution:

Administrative Officers—Tenure of Office and Elections

Qualifications: They shall be members in good stand standing and shall be 18 years of age or older at the time of taking office.

Period of office: Officers shall serve a period of one (1) year and/or until their successors are elected. No member shall be eligible for more than two (2) consecutive terms in the same office.

Nominations: Nominations will be closed with the start of elections at the November meeting. Any member may nominate qualified members for office provided prior consent of the nominee(s) is given.

Elections: Officers shall be elected by a simple majority of the General Assembly present at the November business meeting.

Duties of the Vice President shall be: The Vice President shall serve in the President's place in the event the President is absent or unable to serve for any reason. He will be in charge of club programs and both general club publicity and program publicity. He will be the one to whom other board members report the lines of communications between the President and the Board. He shall serve as chairman of the program and activities committee and shall in the execution of this duty, be responsible for coordinating and scheduling the following: (1) General business meetings and the program agenda; (2) Club activities such as star parties, etc.

Position Open

Duties of the Secretary shall be: The Secretary will be custodian of all official documents and records of the organization and shall, with the President when properly authorized, execute all legal documents in the name of the organization and shall perform other duties delegated to her/him: He shall record the minutes of all meetings of the General Assembly and the Board of Directors and shall at the next succeeding business meeting of the General Assembly, read back all pertinent minutes of all meetings of the General Assembly and Board of Directors occurring from the time of the last regular business meeting. He will be official correspondent with other clubs, organizations, etc. He will be responsible or appoint responsibility for the publication of the club newsletter.

Position Open

Duties of the Properties Officer shall be: The Properties Officer will be in charge of all real properties including the observing site(s), club library, and club instruments; will be the host for the regularly scheduled star parties or responsible for delegating the role; will be in charge of club keys.

Position Open



SAC History

Astronomy in the 70's and 80's

© 2021 by former SAC President, Fred Tretta

Fred continues his series of history of SAC with this third segment...The Editor

My name is Fred Tretta and I was one of the seven people who helped get our club off the ground, and then later had the pleasure of being the first, second and fourth president. When I think historically about our hobby and our club, I can't help but remember astronomy in the 70's and 80's when we were just getting started, how much fun we were having, yet how far we've come since then. Thinking that maybe looking back on that time could be of interest to you, I'd like to share some reflections on those earlier decades.

Our past as a club:

I have previously written on how we spun off from PAS in the late 70s because we felt a need to supplement theoretical cosmological discussions with real time observing. And that, of course, led to the creation of our club. Within a short time, we had a name, we were meeting regularly, we had elected officers, we had established a closeness with Wilson Camera that became a source of new members for us, and one of us was actually publishing a newsletter. Shortly thereafter, Grand Canyon College (now University) welcomed us onto their campus for our meetings, and a fellow interested in astronomy named George Fessler gave us free use of an acre of his land out in what is now East Anthem to develop into our star party site. I'd also like to add that the high point of each year for many of us was our pilgrimage to the Riverside Telescope Makers Conference at Big Bear Lake, CA where we enjoyed sharing the woods with over 500 other astronomers. Those trips are still some of my fondest memories.

A very brief history of my astronomy adventures:

Like so many others, I began astronomy with a 76mm refractor on an altazimuth mount in my backyard, 1972, I believe. As the astronomy hook sunk in deeper, it was replaced with a Criterion Dynascope 6" reflector on a German Equatorial Mount (GEM). Over time, knowledge gained within the Club gave me the confidence to move upward again and I ordered a Tom Cave 10" f/5.6 reflector on a GEM, a serious telescope in those days. Over the years I have built telescopes around a Frank Mercado 10" mirror and three of Carl Zambuto's mirrors, the largest a 16" f/4.9. That one I still get to use occasionally, now in a friend's observatory. Having retired into Flagstaff, my focus is primarily on h-alpha observing through a pair of Lunt solar scopes mounted in my modest 10' observatory. The observatory also houses a 152mm triplet for planetary, as well as camera equipment.

Typical Equipment and Accessories of the 70's and 80's:

Clock drives back then actually were clock motors which synced off the 115VAC 60CPS (hertz) house voltage, but they had two problems. First, those motors were designed to complete things based on 60 seconds (60 CPS) and 24 hours while the stars liked 23 hours, 56 minutes, 4 seconds. Second, AC voltage wasn't always available. So, drive correctors were built to create 115VAC from a 12v battery, and had a variable drive rate. The majority of them were designed around a 555 IC timer and inverter electronics. The problem with these was their sensitivity to temperature which caused rate drifting. Several of us into electronics, instead, designed digital drive correctors using flip flop circuits to create a digital count-down system, the rate of which was set through digi-switches. The dialed-in clock drive rate stayed accurate. I know of one of mine still in operation. Coincidentally, Tim Geisler, who was also experimenting with this same circuitry, sold his commercially, and went on to establish Orion Telescopes.

The eyepieces of those times were frequently orthoscopes for planetary and plossis for more open work. Less expensive, but adequate for higher f-ratio telescopes, were Ramsdens and Kellners, 3 element eyepieces. Wide field eyepieces were frequently Erfles. The selection of eyepieces has certainly improved over the years, though plossis and orthos are still favored for many applications. To be honest though, I don't really feel the same about telescope quality. Frankly, there were people in the 80s who were just plain gifted at correcting optics to an extremely fine figure, despite the lack of precise surface quality test methods. They seemed able to "sense" the optical surface irregularities and correct their optics with as great a precision as any custom optics you can buy today. That Cave 10" f/5.6 mirror I mentioned above was later in its life re-corrected by Frank Mercado to the point where there were **no** compromised zones on it that could be observed. Planetary views through that scope were simply stunning. I have never seen better images through any other 10", nor many larger apertures, for that matter. Scopes of that quality were not uncommon.

Photography back then was done with 35mm SLR film cameras, and deep sky photos often took 2 hours of constant, manual guiding. Several of us modified Practica SLR camera bodies to facilitate better focusing by cutting away the top mounted focusing screen and replacing it with a 25mm eyepiece that was first properly focused, then epoxied in place, a significant improvement. Guiding was generally done using a piggy backed scope, often a 76mm refractor, at high power. Like most, I had my own dark room so I could "push" develop film to bring out the faint details of deep sky objects. Unquestionably, astrophotography has made remarkable leaps forward since then, perhaps more than any other aspect of astronomy.

You might also enjoy knowing that it was common to clean your own optics. I still regularly do such cleaning for myself and friends. For us, there were three essential ingredients needed, distilled water, actual surgical cotton (no wood fibers) and Dawn dish detergent. We created a wash solution by adding one drop of Dawn to a pint of distilled water, stirred. We blew off the surface, then squirted this solution onto the optic with a spray bottle, wetting it thoroughly. We then cleaned the optic with a ball of surgical cotton using a light circular motion, beginning at the center of the optic and swirling outward. The optic was then stood on its edge and a final rinse applied with distilled water. The optic was left on its edge to drip dry. If you installed a water vapor trap in your compressor air line and turned down the pressure, you could blow dry the optic. In caution, however, most window cleaning products such as Windex have ingredients in them that will actually strip away the coatings on some optics.

Finding objects in the sky:

Without aids like computer map software and today's GOTO systems, the process of finding objects was a bit more complex, but entertaining. You began by determining the location of desired objects from manuals, star charts and catalogs. From there, we used one of two methods. In the first method, we relied on the use of setting circles and therefore needed to polar align our mount so the circles would be accurate. Most all of us knew the sky well enough to know where Polaris was on any particular night and so polar alignment occurred quickly and within a couple of minutes of arc. Next, you slewed to a known target, dial in the coordinates of that object on the setting circles, then quickly slewed to your desired new target, again using the circles. You did it quickly because though the declination circle wouldn't be changing, the RA circle was turning with the RA shaft while the RA pointer remained fixed. So, the RA circle started drifting immediately. An important improvement was often made by devising an RA circle pointer that was also driven with the RA shaft in some manner. In that case, the RA setting obviously remained fixed during tracking.

The second method commonly used was called "star hopping". Here, you used your star map to "plot a course" from an object at a known location to the desired target by "hopping" from known star to known star across the sky. Using reasonably bright stars, this worked well. With this method I used a straight through finder where I could keep one eye focused on the finder crosshairs and the other eye open to the sky. With some practice, the crosshairs of the reticle appeared superimposed in the sky. In this way I could move the scope and finder from one star to the next. I still use this method regularly. The creation of finders like the Telrad has greatly simplified this process.

Conclusion:

Being retired, I likely have more hobbies than I should. They keep me active. But astronomy is probably my favorite because this is a hobby that is constantly evolving and the opportunity to actually contribute something to science is always there. I remember times with the PEP gang, AAVSO, timed occultations and so on, that were so rewarding. And the science of today simply continues to produce new opportunities, equipment and results, pushing out the edges of what we know and what we can do as amateurs. The cost and availability of extraordinarily sophisticated equipment that I could only dream of owning in the 80's so enhances this hobby now that new adventures are never ending. Kinda cool. I'm sorry if this has carried on for a bit, but it is fun to think back to those days. I can be reached at ftretta@msn.com if anyone wants to just chat about those early days.

SAC Observing

All Arizona Messier Marathon

Saturday, March 26, 2022, @ Antennas Site



Photo of the field at the antennas site

Photo: Tom Curry

2022 All Arizona Messier Marathon Results

Num.	Name	Scope	Org.	Notes
108	Dominic Michela	Exp.Sci.102	EVAC	M74, M30
103	Brian Poole	SV80ST	SAC	M33,M31,M32,M110,M76,M34,M79 Imaged with ASI 1600mm
97	Terry Shay	90mm Mak	SAC	
80	Thomas Curry	C9.25	SAC	Imaged with Cannon T7i DSLR



Star party view from the Steve Coe memorial east of the field

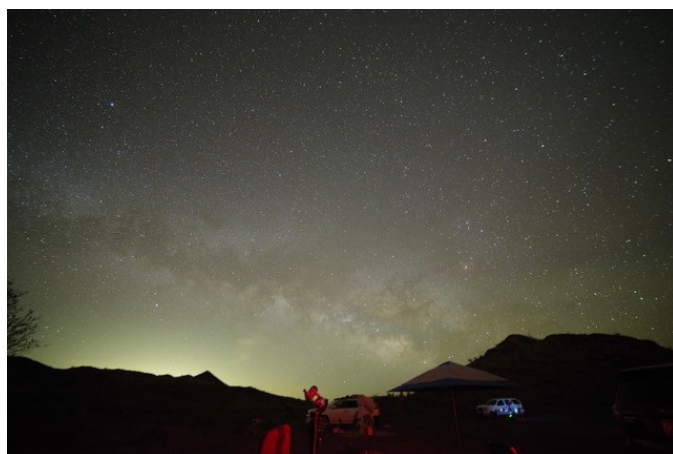
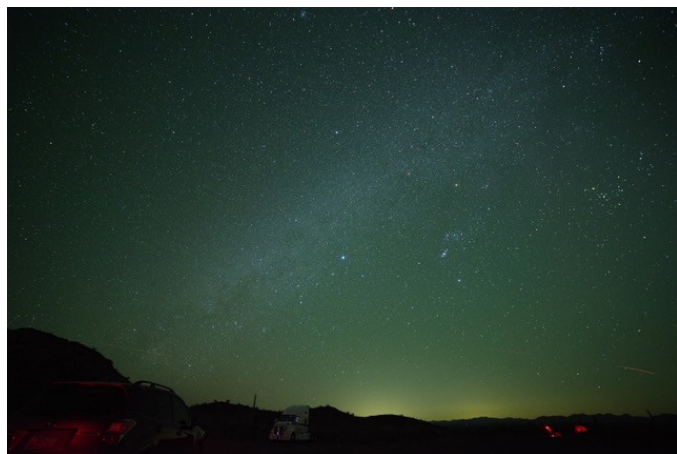
Photo: Michael Poppre

* See more photos next page...

SAC Observing

All Arizona Messier Marathon

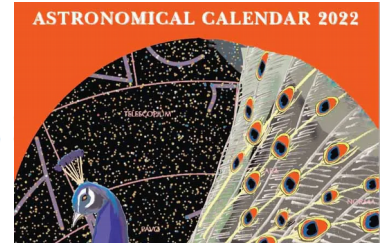
Photos by Terry Shay



SAC Observing

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ASTRONOMICAL CALENDAR

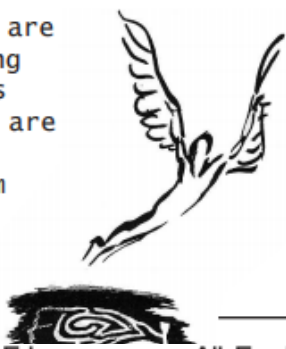


The left column gives Julian Dates (number of days from 4713 B.C. Jan. 1 noon), useful for finding time spans between events by subtraction. The first 3 digits of the Julian date (245) are omitted, to save space.

Hours and minutes, where given, are in Universal Time. (Sometimes the hour appears as "24" or the minute as "60," because the instant was shortly before the end of the day or hour.)

Occasions such as "Moon 1.25° NNE of Venus" are **appulses**: closest apparent approaches. They are slightly different from conjunctions, when one passes north of the other as measured in right ascension or in ecliptic longitude. A quasi-conjunction is an appulse without a conjunction, and typically happens when a planet is near its stationary moment.

Occasions when three bodies are within a circle of small size are "**trios.**" Like appulses, they are most interesting when the bodies are bright and are not at small elongation from the Sun.



For **meteor showers**: ZHR (zenithal hourly rate) is an estimate of the number to be seen under ideal conditions at the peak time if the radiant were overhead. Actual rates may be very different. Peak times (predicted from where the center of the stream seems to cross nearest to Earth's orbit) are uncertain; best to start watching the night before. Meteor are usually most abundant in the morning hours.

Tell me of errors you notice. It's hard to check the accuracy of every detail, but errors are more easily corrected here than in the former printed *Astronomical Calendars!*
universalworkshop.com/contact
This calendar may be subject to improvement. Come back to it!

Explanation of terms can be found in our glossary book **Albedo to Zodiac**. There is more about each kind of event in **The Astronomical Companion**. And events in this list can be traced in the large **Zodiac Wavy Chart** for the year.

For all these, see
universalworkshop.com

9670.5	Apr 1	Fri		All Fools' Day
9670.646	Apr 1	Fri	4	Moon 2.29° SE of Mercury; 4° and 2° from the Sun in the evening sky; magnitudes -4.3 and -1.8
9670.768	Apr 1	Fri	6:26	New Moon ; beginning of lunation 1228
9672.457	Apr 2	SAT	23	Mercury at superior conjunction with the Sun; 1.340 AU from Earth; latitude -4.07°
9672.5	Apr 3	SUN		1st day of Ramadan (1443 A.H.)
9673.271	Apr 3	SUN	19	Moon 0.61° SE of Uranus; 29° from the Sun in the evening sky; magnitudes -6.7 and 5.9; occultation

Continued next page...



SAC Observing

9674.046	Apr 4	Mon	13	Moon at ascending node; longitude 52.9°
9674.583	Apr 5	Tue	2	Mars 0.31° SE of Saturn ; 53° from the Sun in the morning sky; magnitudes 1.0 and 0.9
9674.708	Apr 5	Tue	5	Moon 3.4° SE of the Pleiades; 46° and 45° from the Sun in the evening sky
9675.018	Apr 5	Tue	12	Pluto at northernmost declination, -22.33°
9675.438	Apr 5	Tue	23	Moon 7.0° N of Aldebaran; 54° from the Sun in the evening sky; magnitudes -8.3 and 0.9
9677.299	Apr 7	Thu	19	Moon at apogee; distance 63.41 Earth-radii
9677.354	Apr 7	Thu	21	Moon 2.42° N of M35 cluster; 74° from the Sun in the evening sky; magnitudes -9.4 and 5.3
9678.766	Apr 9	SAT	6	Mercury at ascending node through the ecliptic plane
9678.783	Apr 9	SAT	6:47	First quarter Moon
9678.917	Apr 9	SAT	10	Moon 5.7° S of Castor; 91° from the Sun in the evening sky; magnitudes -10.1 and 1.5
9679.167	Apr 9	SAT	16	Moon 2.17° S of Pollux; 94° from the Sun in the evening sky; magnitudes -10.2 and 1.2
9679.5	Apr 10	SUN		Palm Sunday
9680.313	Apr 10	SUN	20	Moon 3.7° NNE of Beehive Cluster; 107° from the Sun in the evening sky; magnitudes -10.6 and 3.7
9680.390	Apr 10	SUN	21	Venus at descending node through the ecliptic plane
9682.125	Apr 12	Tue	15	Jupiter 0.10° NNW of Neptune; 29° from the Sun in the morning sky; magnitudes -2.1 and 8.0
9682.125	Apr 12	Tue	15	Moon 4.7° NNE of Regulus; 128° and 127° from the Sun in the evening sky; magnitudes -11.3 and 1.4
9683.437	Apr 13	Wed	22	Mercury at perihelion, 0.3075 AU from the Sun
9684.5	Apr 15	Fri		Good Friday
9685.131	Apr 15	Fri	15	The equation of time is 0
9686.146	Apr 16	SAT	16	Moon 4.5° NNE of Spica; 177° from the Sun in the midnight sky; magnitudes -12.7 and 1.0
9686.289	Apr 16	SAT	18:56	Full Moon
9686.5	Apr 17	SUN		Easter
9687.604	Apr 18	Mon	3	Mercury 1.97° NNW of Uranus; 16° from the Sun in the evening sky; magnitudes -1.0 and 5.9
9688.085	Apr 18	Mon	14	Moon at descending node; longitude 232.6°
9688.711	Apr 19	Tue	5	Sun enters Aries, at longitude 29.13° on the ecliptic
9688.750	Apr 19	Tue	6	Moon shows minimum libration for the year, 1.75°
9689.136	Apr 19	Tue	15:15	Moon at perigee; distance 57.25 Earth-radii
9689.333	Apr 19	Tue	20	Moon 3.0° NNE of Antares; 139° from the Sun in the morning sky; magnitudes -11.7 and 1.0
9689.602	Apr 20	Wed	2	Sun enters the astrological sign Taurus, i.e. its longitude is 30°
9692.292	Apr 22	Fri	19	Lyrid meteors; ZHR 18; 1 day before Last Quarter Moon
9692.998	Apr 23	SAT	11:57	Last quarter Moon
9693.645	Apr 24	SUN	3	Mercury at northernmost latitude from the ecliptic plane, 7.0°

Continued next page...



SAC Observing

9694.5	Apr 25	Mon	0	Moon 4.3° SE of Saturn; 71° from the Sun in the morning sky; magnitudes -9.3 and 0.9
9695.563	Apr 26	Tue	2	Moon 3.6° SE of Mars; 57° and 58° from the Sun in the morning sky; magnitudes -8.6 and 0.9
9696.729	Apr 27	Wed	6	Moon 3.4° SE of Venus; 43° from the Sun in the morning sky; magnitudes -7.7 and -4.1
9696.742	Apr 27	Wed	6	Moon, Venus, and Neptune within circle of diameter 3.40°; about 43° from the Sun in the morning sky; magnitudes -8, -4, 8
9696.792	Apr 27	Wed	7	Moon 3.4° SE of Neptune; 42° and 43° from the Sun in the morning sky; magnitudes -7.7 and 7.9
9696.858	Apr 27	Wed	9	Moon, Venus, and Jupiter within circle of diameter 4.12°; about 41° from the Sun in the morning sky; magnitudes -8, -4, -2
9696.858	Apr 27	Wed	9	Moon, Jupiter, and Neptune within circle of diameter 3.88°; about 41° from the Sun in the morning sky; magnitudes -8, -2, 8
9697.000	Apr 27	Wed	12	Moon 3.3° SE of Jupiter; 40° from the Sun in the morning sky; magnitudes -7.5 and -2.1
9697.313	Apr 27	Wed	20	Venus 0.02° E of Neptune; 43° from the Sun in the morning sky; magnitudes -4.1 and 7.9; quasi-conjunction
9697.375	Apr 27	Wed	21	Venus, Jupiter, and Neptune within circle of diameter 2.86°; about 42° from the Sun in the morning sky; magnitudes -4, -2, 8
9698.725	Apr 29	Fri	5	Pluto stationary in longitude; starts retrograde motion
9698.833	Apr 29	Fri	8	Mercury at easternmost elongation ; 20.6° from Sun in evening sky; magnitude 0.3
9699.771	Apr 30	SAT	7	Mercury 1.34° SE of Pleiades; 21° from the Sun in the evening sky
9699.873	Apr 30	SAT	9	Pluto stationary in right ascension; starts retrograde motion
9700.354	Apr 30	SAT	20:30	New Moon ; beginning of lunation 1229; partial eclipse of the Sun
9700.396	Apr 30	SAT	22	Venus 0.23° SE of Jupiter ; 43° from the Sun in the morning sky; magnitudes -4.1 and -2.1

SAC Outreach

Grand Canyon Star Party, North Rim

Saturday to Saturday, June 18-25



Telescope viewing on the veranda of Grand Canyon Lodge on the North Rim
Photo courtesy of Christian Schroll

From the Grand Canyon Star Party website,
<https://www.nps.gov/grca/planyourvisit/grand-canyon-star-party.htm>

North Rim Star Party 2022

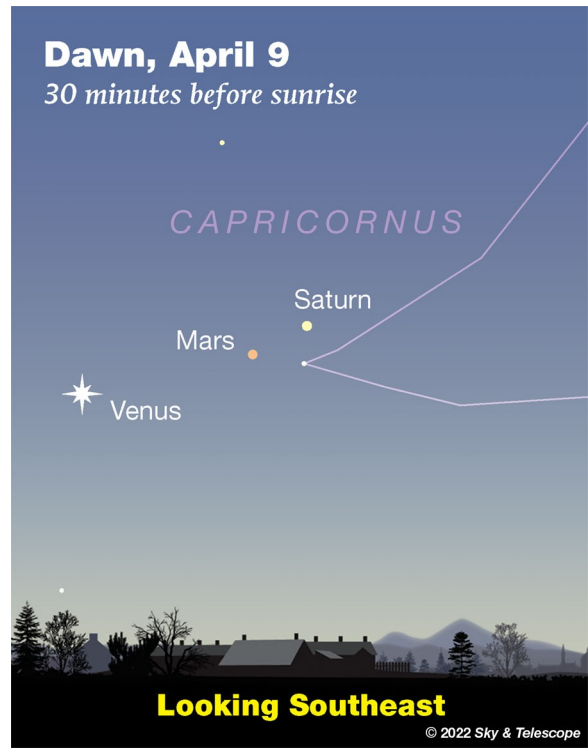
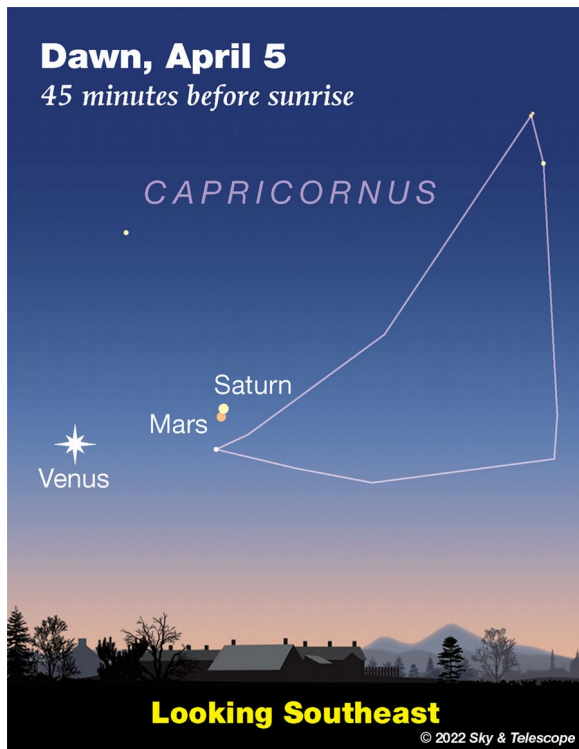
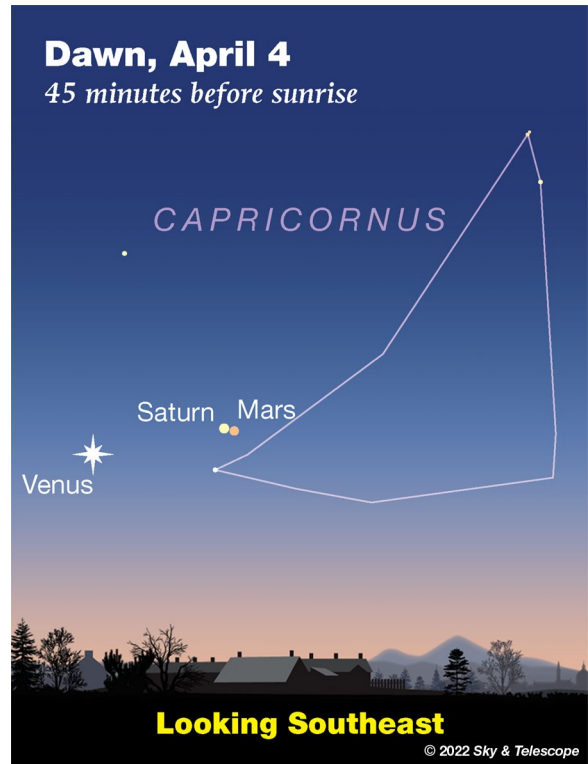
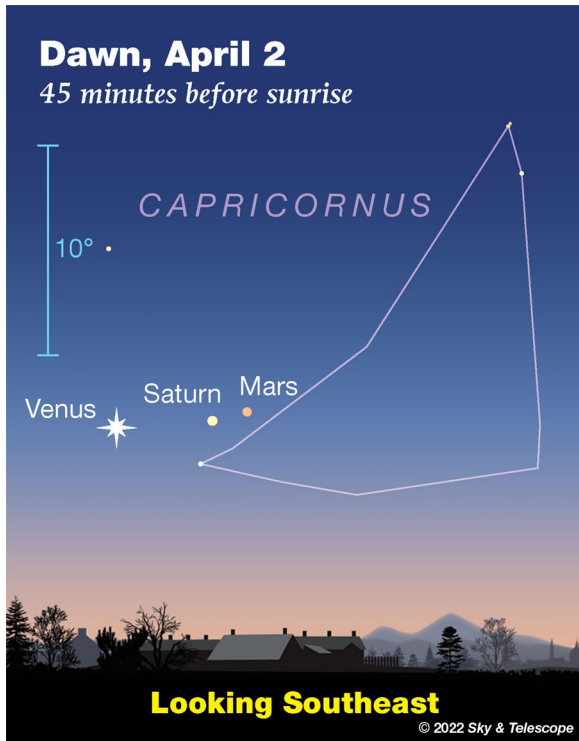
Telescopes are set up on the porch of the Grand Canyon Lodge every evening. An astronomy related evening program will be presented at 8 pm in the auditorium of Grand Canyon Lodge. Check park bulletin boards for the evening program schedule.

Constellation talks are also given, throughout the evening.

By day, solar telescopes are set up at the lodge, the Visitor Center and the general store (by campground.)

The North Rim Star Party is sponsored by the Saguaro Astronomy Club of Phoenix, Arizona.

SAC Sky



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[Click here to return to page 1](#)

2022 SAC Officers and Contacts

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 Vice-President
 Treasurer Jack Jones ([mail to:treasurer@saguaroastro.org](mailto:treasurer@saguaroastro.org))
 Secretary
 Properties

Non-board Positions

Novice Leader Steve Dodder ([mail to:fester00@hotmail.com](mailto:fester00@hotmail.com))
 Newsletter Rick Rotramel ([mail to:r.rotramel@cox.net](mailto:r.rotramel@cox.net))
 Webmaster Robert Brewington ([mail to:webmaster@saguaroastro.org](mailto:webmaster@saguaroastro.org))
 Public Events Jack Jones ([mail to:publicevents@saguaroastro.org](mailto:publicevents@saguaroastro.org))
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 Deep Sky Kevin Kozel ([mail to:kevin.kozel@cox.net](mailto:kevin.kozel@cox.net))
 Public Outreach Tom Curry (canyonhiker2@cox.net)

SAC on Facebook: <https://www.facebook.com/groups/420992487938402/>

2022 Board Mtgs:

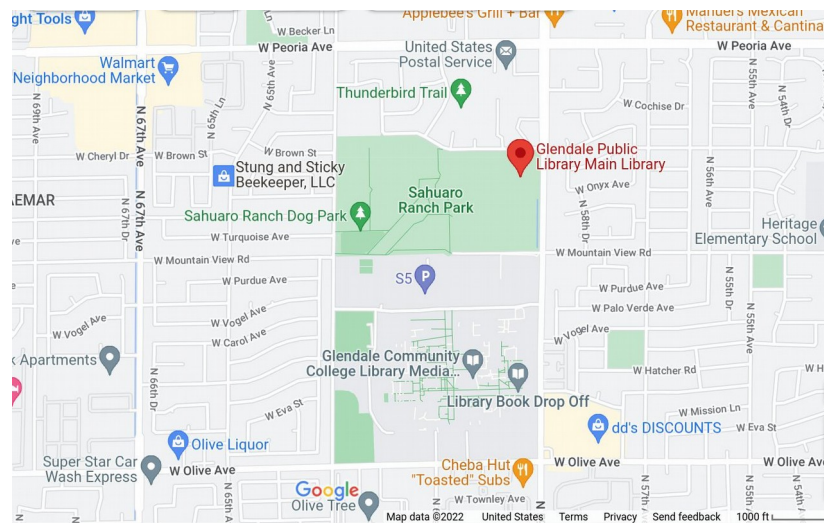
January, TBA
 April, TBA
 July, TBA
 October, TBA

Occultation Info

Wayne Thomas has asteroid occultation info for the greater Phoenix Area:

Mail to: tomwaymas@gmail.com

Meeting Location: The Glendale Main Library, 6:00 PM
 5959 W. Brown St, Glendale, AZ (59th Ave, between Olive & Peoria Avenues, west side of street)



Saguaro Astronomy Club

Saguaro Astronomy Club (SAC), Phoenix, Arizona, was formed in 1977 to promote fellowship and the exchange of scientific information among its members-amateur astronomers. SAC meets monthly for both general meetings and star parties, and regularly conducts and supports public programs on astronomy. Membership is open to anyone with these interests.

Saguaro Skies is posted as a pdf file monthly on the SAC website,

<https://www.saguaroastro.org/newsletter/>

for browsing or downloading for SAC members and friends of SAC. A email announcement of the monthly newsletter release is included with membership.

Direct all membership inquiries to the SAC Treasurer by using the membership form found in this newsletter. For editorial and SUCH-A-DEAL advertising inquiries, contact the Saguaro Skies Editor.

Contacting This Issue's Authors

If you wish to write to an author in this month's issue, contact them by sending your message to the editor of Saguaro Skies, Rick Rotramel, at: r.rotramel@cox.net

I will then forward your questions or comments to the author.

Saguaro Skies Staff

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Saguaro Astronomy Club Membership Services

Membership -- Memberships are for the calendar year and are pro-rated for new members as follows:
Jan - Mar: 100%; Apr - Jun: 75%; Jul - Sep: 50%; Oct - Dec 25%.

- \$32.00 Individual Membership
- \$36.00 Family Membership



Note: You can now pay with PayPal through the SAC Website. Click Below:

<https://www.saguaroastro.org/join-sacpaypal/>



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**SAC Treasurer
3222 W Lucia Dr,
Phoenix, AZ 85083**

**Saguaro
Astronomy Club**

SAC on the Internet

*SAC has several email lists. To subscribe, simply send an email to the list address with **Subscribe** on the subject line.*

SAC-Announce@freelists.org - Sac Announce is a list used for club announcements. Traffic is usually less than six messages per month.

SAC-Forum@freelists.org - SAC Forum is a general discussion list for members to discuss the club or astronomy in general.

SAC-Board@freelists.org - SAC Board is a list for discussions of club business. If you'd like to see how the club is being run, this is the list for you.

AZ-Observing@freelists.org - AZ-Observing is not a SAC list, but many members participate. This is the list for discussions on observing around the state.

Please download the PDF version of the monthly newsletter from our website. When the newsletter is published a message will be sent to the email address provided above containing a URL to the current newsletter.

<http://saguaroastro.org/newsletter/>

