

San Diego Astronomy Association

Celebrating Over 50 Years of Astronomical Outreach



February 2022

SDAA Update

<https://www.sdaa.org/>
A Non-Profit Educational Association
P.O. Box 23215, San Diego, CA 92193-3215

Next SDAA Business Meeting

February 8th at 7:00pm
10070 Willow Creek Rd
San Diego, CA 92131
Via Zoom

Next Program Meeting

February 12th at 7:00pm
Live Stream

SDAA is now actively using online facilities like Zoom and YouTube to provide access to club meetings and special events. While the our public outreach events have restarted in some San Diego County facilities, most events in city owned facilities are still undergoing review.

Public outreach events have restarted at The Lipp telescope. The Lipp hosts will limit the amount of people inside the observatory when the telescope is operational. Please observe masking and social distancing guidelines if you are unvaccinated.

As the pandemic remains a part of our lives, please continue to observe safe practice guidelines while at TDS.

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San Diego Astronomy Association
Incorporated in California in 1963

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Program Meeting February 12th Annual Banquet

Speaker: **Scott Kardel**

Topic: **Revolution in Amateur Astronomy: Electronically Assisted Astronomy**

Once again this year, the SDAA's annual banquet and fund raiser will be virtual using the Zoom platform. Similar to last years fund raiser, we will host a sweepstakes and an online silent auction with some exciting items included in both the Auction and Sweepstakes. Mike Chasin will once again take on the Master of Ceremonies role and SDAA member Claudio Martin will provide outstanding live musical entertainment starting an hour before the official meeting begins. Event registration is 20.00 dollars and includes one sweepstakes entry. Upon registration, you will be e-mailed a Zoom invite link for the meeting. The sweepstakes deadline is 8:30pm, February 9th. If folks wait until the night of the banquet, it will be too late. The auction is open until February 12, at 8:30pm.

Link for sweepstakes: <https://go.eventgroovefundraising.com/ace6bf/Campaign/Details>

Link for auction: <https://go.eventgroovefundraising.com/b6b5d1>

For your convenience, the Zoom meeting will be open for three days prior to the event starting at 6:00 pm each night allowing all registered participants to verify connectivity.

Newsletter Deadline
The deadline to submit articles
for publication is the
15th of each month.

Link to SDAA Merchandise Store <https://sdaa28.wildapricot.org/SDAA-Store>

Link to Outreach Calendar <https://calendar.google.com/calendar/embed?src=g-calendar@sdaa.org&ctz=America/Los>



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2021 Banquet Speaker is Scott Kardel

Revolution in Amateur Astronomy: Electronically Assisted Astronomy

A new wave of consumer telescopes with integrated imaging systems are poised to revolutionize the hobby of astronomy. Astronomer Scott Kardel from Palomar College discusses his experience using one of these new telescopes and explains how they are changing public outreach, creating an easy entry into astrophotography to more people than ever before and are being used as powerful tools for citizen science.



Professor Kardel is an associate professor of astronomy in the Earth, Space & Environmental Sciences department at Palomar College and is assistant director of the Palomar College Planetarium. He has a B.S. in physical science / secondary education from Northern Arizona University and an M.S. in astronomy from the University of Arizona. SDAA members know him as former outreach coordinator at Palomar Observatory and as an executive with the International Dark Sky Association. He has also worked at Lake Afton Public Observatory and as a high school science teacher.



San Diego Astronomy Association

San Diego Astronomy Association Board of Directors Meeting January 11, 2022 – Unapproved and subject to revision

1. Call to Order

The meeting was held via Zoom and was called to order at 7:10pm with the following board members in attendance: Dave Wood, President; Kin Searcy, Vice President; Melany Biendara, Treasurer; Gene Burch, Recording Secretary; Alicia Linder, Corresponding Secretary; Hiro Hakozaki, Director; Dave Decker, Director; Mike Chasin, Director; Gracie Schutze, Director, Paul Krizak, Loaner Scope Chairperson; Ben Grunbaum, Site Maintenance Chairperson; Steve Myers, Primary Grid Reconstruction Chairperson.

2. Approval of Last Meeting Minutes

The December meeting minutes were approved.

3. Treasurers & Membership Report

The treasurer's report was approved. Mel is still working with a business banker to straighten out the mess caused by the counterfeit check cashed on our account. She has thwarted several other attempts to access our accounts and we may have to change banks to eliminate further attempts. Our taxes have been filed and our income from the sale of donated telescopes is around \$5,000.

4. Standard Reports

a. Site Maintenance Report:

Ben Grunbaum - SDGE has a program (in conjunction with CalFire and SD Fire) to thin out and prune vegetation within about 50 feet of their power poles to reduce the danger of fire due to downed power lines. Steve Myers provided some additional information about the extent of the work. The down side of having them do it will be more light intrusion from the properties to the west of TDS. However, if we don't allow them do it, we will probably be liable for any fire damage that might occur. It was decided that we need to let them do the work and then come up with a plan to mitigate the light intrusion, which is already a problem.

Ben showed a sample of signage he'd like to post in the common areas at TDS reminding members to keep the area clean and that any personal items left behind will be disposed of. The board agreed and Ben will post the signs the next time he's out there.

Mel said the door knob to the warming room seems to be wearing out and Ben will check on that.

b. Observatory/Loaner Scope Report:

Observatory:

Observatory has been running well. We have excellent host participation and attendance. Filling the 2022 host schedule now.



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Rancho Bernardo High School – Astronomy Club is scheduled for January 29th. It is a Public Star Party and the hosts have been informed to be ready.

Loaner Scopes:

Paul Krizak introduced himself as the Loaner Scope Chairperson. Knowledge transfer from Ed Rumsey is proceeding and Paul will get hands-on training on Feb 5 at TDS. One scope is still out (SDAA#004 8" LX-90) that Ed is going to close out.

Loaner forms and associated documentation now consolidated into Google Drive so it can be shared and is backed up and the link has been shared with Dave Wood.

c. Private Pad Report:

We have 4-6 unleased pads (two lessees haven't renewed but they appear to be using the pads so I'm still trying to sort that out) and 7 people on the waiting list. We have 2 people working on proposals for pad upgrades.

As for usage, we are pretty good this year. A large number of the people who show up in red are new lessee's. Most actually met their minimum use. For the new lessee's who didn't meet their minimums, my proposal is to send them a reminder that they need to be logging in. For anybody who just had 3 uses, I'll just send them a reminder that the minimum is 4.

d. Program Meetings Report:

Zolt Levay is confirmed for the January program meeting. February is the banquet meeting, the March speaker is lined up and Kin is working on a speaker for April. In person meetings at Mission Trails are still on hold and other potential sites that have been looked at are not promising.

e. AISIG Report:

There was no AISIG meeting in December and we still need someone to take over as the AISIG chairperson.

f. Newsletter Report:

All looks great – Thanks Andrea!

g. Website Report:

New All Sky Cam images have been added to the TDS weather page – thanks to Mike Chasin, Hiro and Jeff!

h. Social Media:

No Report.



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i. Outreach Report:

Below is a summary of outreach event participation with numbers for December and for YTD:

2021	December	YTD
Events Completed	5	34
Events Cancelled	2	53
Total Attendance	105	1687

Public turnout for our events was low in December, most probably due to Holiday schedules. Total participation for calendar year 2021 was also low, but we did not resume our outreach effort until mid-year, and there were no school events planned. With recent trends at the state and local level, it is unlikely that we will resume full support for public schools until the Fall of 2022.

Our event planned for West Sycamore on December 17, was moved to the Oak Oasis site due to park closure, just hours before our planned arrival. In spite of this late change, there were a few families and groups who discovered our change and were able to relocate. We discussed the possibility of having a phone number or some other way where people could check for any last-minute changes or cancellations to an outreach event. Google Voice was mentioned and Hiro is going to do some research.

Re: The Timeanddate.com live eclipse program, we learned from their metrics that approximately 75% of the 516,000 views on YouTube were done with cell phones. Similar stats were posted for the 32,000 views on Facebook. And as expected, half of the viewers are under 35 years of age. These metrics are consistent with trends published for other entertainment sources.

j. TARO Report:

The new UPS and PDU communication cards have installed and are now functional.

Quite a bit of water leakage was noticed on the floor during my last visit. Not a big problem but I'll need to reseal the base of the observatory structure to slow down the water flow on the floor. I also need to get out and service the Paramount's Dec and AZ drive gears. It's been a while since any lubrication was done.

TARO is operational and is accepting DSO/EXO target imaging requests, weather permitting. We discussed the possibility of adding a TARO page to our website.

k. Cruzen Report:

Still proceeding at a snail's pace.



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- i. Merchandise Report:
One sale this month.

- m. Astronomical League Report:
Nothing new to report.

- n. JSF Report:
Plans for JSF 2022 are proceeding and Dan Kiser will update the board at the February meeting.

- o. Primary Grid Reconstruction Report
Steve Myers provided a very detailed report on the proposed upgrade of the electrical grid at TDS. The plan is to upgrade the grid in phases, with the first step being to finish the upgrade to the private observatories. Steve is working on the final cost estimate of that phase and is talking with the observatory owners in an effort to get donations from them to help cover the cost.

After that phase is complete, work will begin on the private pads, with construction likely to start with the middle road, then the north road and finally the south road.

Steve will work with a committee and present a final plan and cost estimate to the board for approval and we'll budget for the cost in in the 2022/2023 fiscal year.

Many thanks to Steve for his hard work and detailed plans.

5. **Old Business:**

- a. The SDAA Banquet is scheduled for February 12, 2022 via Zoom. Work is progressing on collecting donations for auction and sweepstakes items. Mike C is putting the final touches on the banquet Auction/Sweepstakes website.
- b. Dave and Ben G are continuing to research replacing our existing patio cover.
- c. Light trespass at TDS continues to be a concern and Ben and Mel are going to coordinate to see if adding another shipping container or two along the west fence line would help.
- d. Other Old Business – none

6. **New Business:**

- a. New business - none

7. **Adjournment:** The meeting was adjourned at 9:02pm.

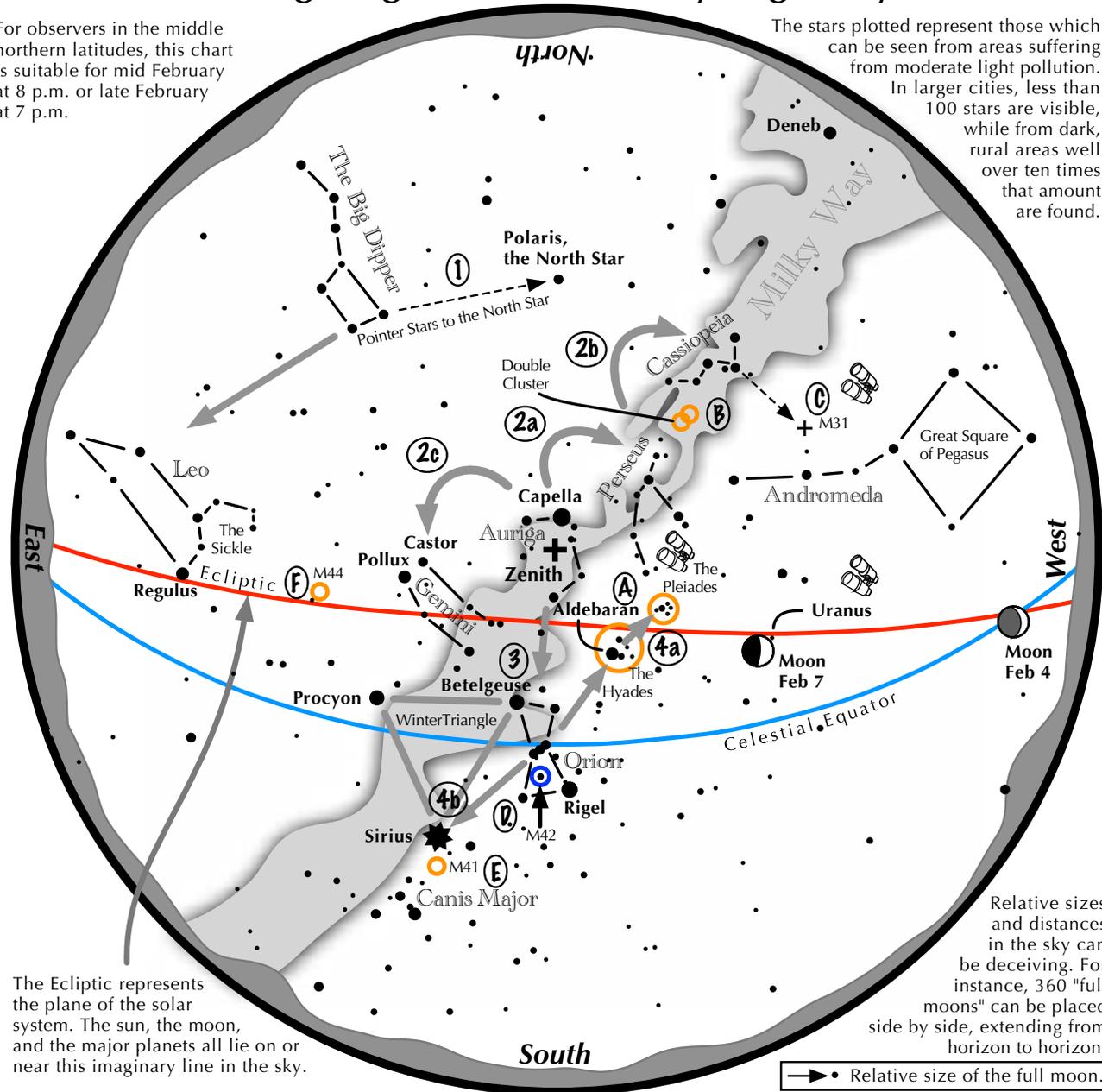


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Navigating the mid February Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid February at 8 p.m. or late February at 7 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

Navigating the February night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius, a member of the Winter Triangle.

Binocular Highlights

- A: Examine the stars of two naked eye star clusters, the Pleiades and the Hyades.
- B: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.
- C: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D: M42 in Orion is a star forming nebula. E: Look south of Sirius for the star cluster M41. F: M44, a star cluster barely visible to the naked eye, lies southeast of Pollux.



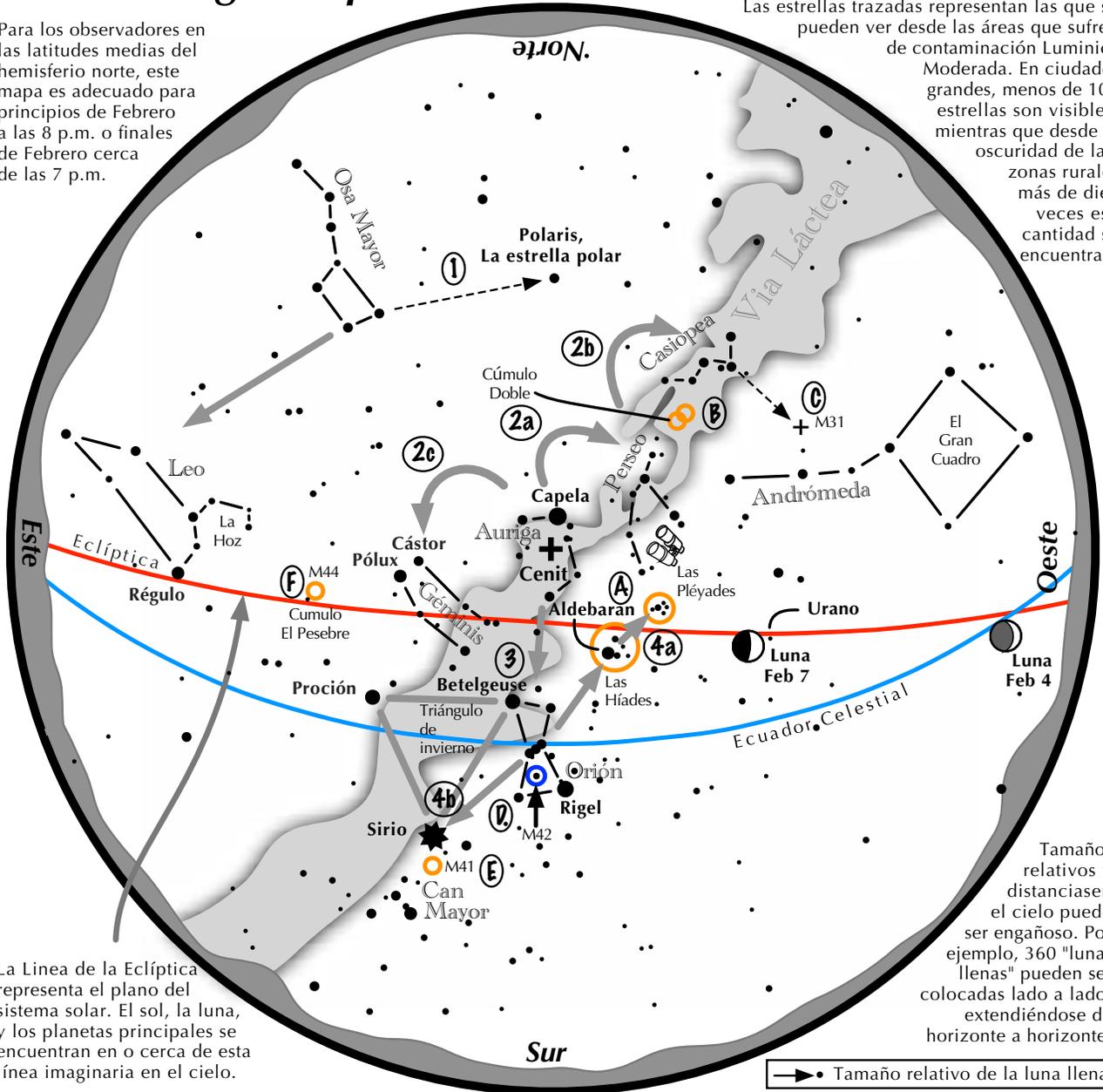


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Navegando por el cielo nocturno de Febrero

Para los observadores en las latitudes medias del hemisferio norte, este mapa es adecuado para principios de Febrero a las 8 p.m. o finales de Febrero cerca de las 7 p.m.

Las estrellas trazadas representan las que se pueden ver desde las áreas que sufren de contaminación Luminica Moderada. En ciudades grandes, menos de 100 estrellas son visibles, mientras que desde la oscuridad de las zonas rurales más de diez veces esa cantidad se encuentran.



La Línea de la Eclíptica representa el plano del sistema solar. El sol, la luna, y los planetas principales se encuentran en o cerca de esta línea imaginaria en el cielo.

Tamaños relativos y distancias en el cielo puede ser engañoso. Por ejemplo, 360 "lunas llenas" pueden ser colocadas lado a lado, extendiéndose de horizonte a horizonte.

→ • Tamaño relativo de la luna llena.

Navegando por el cielo nocturno: simplemente comience con lo que sabe o con lo que puede encontrar fácilmente.

- 1 Sobre el horizonte noreste se alza la Osa Mayor. Dibuja una línea desde sus dos estrellas finales hasta la estrella polar.
- 2 Desde Capela, salte hacia el noroeste a lo largo de la Vía Láctea hacia Perseo, luego hacia la "W" de Casiopea. Siguiendo el salto hacia el sureste desde Capela a las estrellas gemelas de Cástor y Pólux en Géminis.
- 3 Directamente al sur de Capela se encuentra la constelación de Orión con sus tres estrellas del Cinturón de Orión, su brillante estrella roja Betelgeuse y su brillante estrella azul-blanca Rigel.
- 4 Usa las tres estrellas del Cinturón de Orión para apuntar al noroeste hacia la estrella roja Aldebarán y el cúmulo estelar Híades, y luego hacia el cúmulo estelar de las Pléyades. Viaja hacia el sureste desde las estrellas del cinturón hasta la estrella más brillante en el cielo nocturno, Sirio. Es un miembro del Triángulo de invierno.

Puntos destacados con binoculares

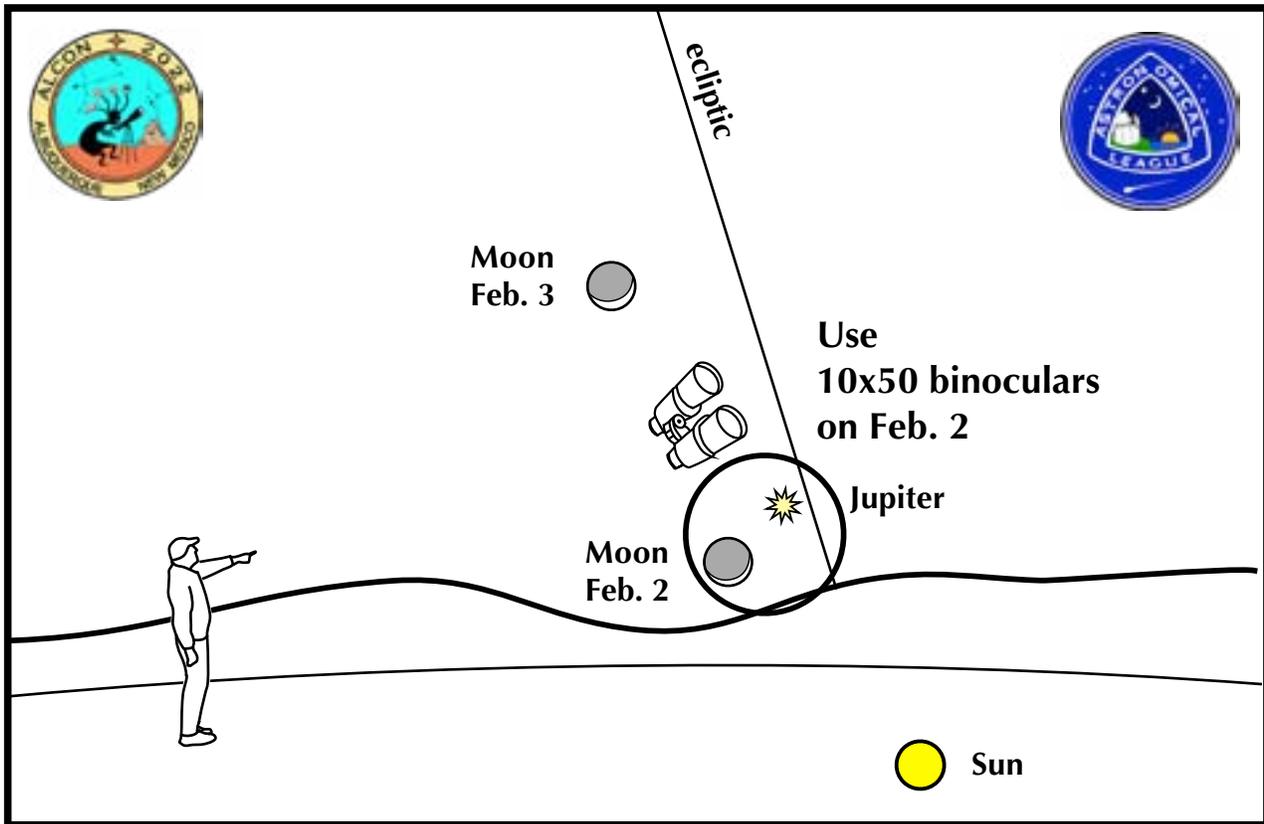
A: Examina las estrellas de las Pléyades y las Híades. **B:** Entre la "W" de Casiopea y Perseo se encuentra el Doble Cúmulo de Perseo. **C:** Las tres estrellas más occidentales de la "W" de Casiopea apuntan hacia el sur hasta M31, la Galaxia de Andrómeda, un óvalo "borroso." **D:** M42 en Orión es una nebulosa formadora de estrellas. **E:** Mire al sur de Sirio para ver el cúmulo estelar M41. **F:** M44, un cúmulo de estrellas apenas perceptible a simple vista, se encuentra al sureste de Pollux.





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If you can see only one celestial event in the evening this February, see this one.



- Look in the southwest beginning 30 minutes after sunset on February 2.
- Jupiter shines low above the horizon with the very thin crescent moon glowing immediately to its lower left.
- The moon is 1.7 days past new for East Coast viewers, and 1.9 days for West Coast observers.
- This is a good opportunity to observe the moon and fulfill the "young moon" requirement for the Astronomical League's Lunar Observing Program.



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Meade Model 622 Comet Tracker 6" (f/3.60)



Presale price of **\$215.00** plus fees for Contributing Members only.
Cloudy Nights & Astromart pricing will be **\$250.00** plus fees and shipping.

Made in the USA with clean optics. The signature Meade blue paint is beautiful. These OTAs are sought after by astro imagers for their fast, $f/3.60$ optics that have less coma than an equivalent Newtonian. Plus, no diffraction spikes! 6" of light gathering with a 549mm focal length with no chromatic aberration or diffraction spikes and less coma, is hard to replicate at a low price. By design, the focal plane is well placed for an SLR camera, though you would need to add a 2" nose piece to your camera.

As the "Cometracker" name suggests, these Schmidt-Newtonian telescopes are popular for visual use for comet hunting, as the field is large, bright, has no diffraction spikes, and shows less coma than an equivalent Newtonian. With a 25mm 60° "Super Plössl" eyepiece, this scope will deliver a breathtaking 2.7° field while staying under a 7mm exit pupil. A 1¼" eyepiece holder is included; you may need a 2" extension tube to get 2" eyepieces to come to focus.

The included manual German equatorial mount has bolted-on tube rings (no dovetail) to hold the OTA. One ring has been repaired as shown in the first photograph. The manual controls are all smooth. While not rock solid, the mount is plenty adequate to return nice images if fitted with a clock drive. Or attach a dovetail to the rings and use the OTA on your own mount.

We are selling "as-is." If you're looking for a fast, portable astrograph or a superb wide field visual instrument, this is an excellent telescope at a very reasonable price.

Dave Decker, for SDAA, Outreach@sdaa.org, 619.972.1003



San Diego Astronomy Association

SDAA Contacts

Club Officers and Directors

President	Dave Wood	President@sdaa.org	(858) 735-8808
Vice President	Kin Searcy	VicePresident@sdaa.org	
Recording Secretary	Gene Burch	Recording@sdaa.org	(858) 926-9610
Treasurer	Melany Biendara	Treasurer@sdaa.org	(619) 213-9887
Corresponding Secretary	Alicia Linder	Corresponding@sdaa.org	
Director Alpha	Pat Boyce	DirectorAlpha@sdaa.org	(619) 227-9614
Director Beta	Mike Chasin	DirectorBeta@sdaa.org	(858) 210-1454
Director Gamma	Dave Decker	DirectorGamma@sdaa.org	(619) 972-1003
Director Delta	Hiro Hakozaiki	DirectorDelta@sdaa.org	(858) 869-9507

Committees

Site Maintenance	Bill Quackenbush	TDS@sdaa.org	(858) 395-1007
Observatory Director	Ed Rumsey	Observatory@sdaa.org	(858) 722-3846
Private Pads	Mark Smith	Pads@sdaa.org	(858) 484-0540
Outreach	Dave Decker	Outreach@sdaa.org	(619) 972-1003
N. County Star Parties	-Vacant-	NorthStarParty@sdaa.org	
S. County Star Parties	-Vacant-	SouthStarParty@sdaa.org	
E. County Star Parties	Dave Decker	EastStarParty@sdaa.org	(619) 972-1003
Central County Star Parties	Dennis Ammann	CentralStarParty@sdaa.org	(619) 247-2457
Camp with the Stars	-Vacant-	CampWiththeStars@sdaa.org	
K.Q. Ranch Coordinator	Dennis Ammann	KQ@sdaa.org	(619) 247-2457
Newsletter	Andrea Kuhl	Newsletter@sdaa.org	(858) 547-9887
New Member Mentor	Dan Kiser	Mentor@sdaa.org	(858) 922-0592
Webmaster	Jeff Stevens	Webmaster@sdaa.org	(858) 566-2261
AISIG	Scott Dixon	AISIG@sdaa.org	(858) 673-9588
Site Acquisition	-Vacant-	SecondSite@sdaa.org	
Field Trips	-Vacant-	FieldTrips@sdaa.org	
Grants/Fund Raising	-Vacant-	Grants@sdaa.org	
Julian StarFest	-Vacant-	info@julianstarfest.com	
Merchandising	Gene Burch	Merchandising@sdaa.org	(858) 926-9610
Publicity	Jeff Flynn	Publicity@sdaa.org	(619) 806-6505
Loaner Scopes	Paul Krizak	loanerscopes@sdaa.org	
Governing Documents	TBD		
TDS Network	Dave Wood	TDSNet@sdaa.org	(858) 735-8808
Amateur Telescope Making	-Vacant-		
ALCOR (Astronomical League Correspondent)	Dave Decker	ALCOR@sdaa.org	(619) 972-1003

SDAA Editorial Staff

Editor - Andrea Kuhl

newsletter@sdaa.org

Assistant Editor: Craig Ewing

Have a great new piece of gear? Read an astronomy-related book that you think others should know about? How about a photograph of an SDAA Member in action? Or are you simply tired of seeing these Boxes in the Newsletter rather than something, well, interesting?

Join the campaign to rid the Newsletter of little boxes by sharing them with the membership. In return for your efforts, you will get your very own byline or photograph credit in addition to the undying gratitude of the Newsletter Editor. Just send your article or picture to Newsletter@SDAA.Org.



San Diego Astronomy Association

2022 Texas Star Party – Reminder to Submit Your Application To Attend TSP 2022

2022 Texas Star Party – Extension and Reminder to Submit Your Application To Attend TSP 2022
April 8, 2022

Fellow amateur astronomers and TSP veterans! We are extending the application period for 2022 Texas Star Party (April 24 – May 1). We will close this extension at midnight CDT January 15, 2022.

If you have already sent in your application, do not be concerned. Your application is in our database. And we apologize for your receiving this reminder/announcement of our reopening and extending the application window.

You must login to this website to apply to attend. If you do not have a Texas Star Party account, please click here <https://texasstarparty.org/create-account/> to create a new account.

If you already have a TSP account, please login https://texasstarparty.org/login/?redirect_to=https%3A%2F%2Ftexasstarparty.org%2F%3Flogged_in%3D1 and update your account as needed.

After you login to your account, please click here <https://texasstarparty.org/application-to-attend-tsp-2022/> to complete and submit your application for TSP 2022.

And for your consideration, we offer you. . .

Top Ten Reasons Not to Miss the Upcoming 2022 Texas Star Party!

1. Unequaled clear dark skies in the Davis Mountains. That is why they built McDonald Observatory up the road from our observing site.
2. Multiple rooming options to meet your budget, including RV and tent camping.
3. The Milky Way is ideally placed overhead during our April/May schedule.
4. Internet availability in many places at our observing site.
5. Vendors allow you to inspect and evaluate their products on site. No online purchase surprises.
6. Reasonable Covid precautions in place to allow you to finally enjoy an out-of-town vacation.
7. You can visit many places of interest for the whole family in the Davis Mountains, including: McDonald Observatory, the Museum of the Big Bend in Alpine, the Scenic Loop, Chihuahuan Desert Research Institute and Nature Center, Marfa Lights, native American petroglyphs, outstanding birding opportunities, nearby art museum and galleries, the VLBA radio telescope (National Radio Astronomy Observatory), the tours of the military Fort Davis of the Buffalo Soldiers, and many hiking trails nearby. You can even swim or scuba dive in San Solomon Springs at Balmorhea State Park. Guadalupe Mountains National Park, Carlsbad Caverns, Big Bend State Park, Monahans Sandhills State Park and Big Bend National Park are all within driving distance.
8. Clear, cool air and amazing vistas of the Davis Mountains to restore your soul in nature, after a long time being cooped up in the house or office.
9. The many activities connected to astronomy and telescopes within the Texas Star Party, such as afternoon talks by our peers, and evening talks, including Deborah Bird, one of the founders of Texas Star Party. Contests for art and astrophotography.
10. A chance to meet up with your astronomical friends you have not seen recently and make new friends.

TSP Staff are looking forward to seeing all of you at TSP 2022.

If you have any questions please contact TSP Housing at tsphousing@texasstarparty.org

Have a great year!
Regards,
TSP management.



San Diego Astronomy Association

NASA Night Sky Notes

February 2022



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.

Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Hang Out with the Twins of Gemini

David Prosper

The night skies of February are filled with beautiful star patterns, and so this month we take a closer look at another famous constellation, now rising high in the east after sunset: Gemini, the Twins!

If you're observing Orion, as discussed in last month's article, then Gemini is easy to find: just look above Orion's "head" to find Gemini's "feet." Or, make a line from brilliant blue-white Rigel in the foot of Orion, through its distinct "Belt," and then on through orange Betelgeuse. Keep going and you will end up in between the bright stars Castor and Pollux, the "heads" of the Gemini Twins. While not actually related – these stars aren't bound to each other, and are almost a magnitude apart in brightness – they do pair up nicely when compared to their surrounding stars. Take note: more than one stargazer has confused Gemini with its next-door neighbor constellation, Auriga. The stars of Auriga rise before Gemini's, and its brightest star, Capella, doesn't pair up as strikingly with its second most brilliant star as Castor and Pollux do. Star-hop to Gemini from Orion using the trick above if you aren't sure which constellation you're looking at.

Pollux is the brighter of Gemini's two "head" stars - imagine it has the head of the "left twin" - and located about 34 light-years away from our Solar System. Pollux even possesses a planet, Pollux b, over twice the mass of Jupiter. Castor - the head of the "right twin" - by contrast, lies about 51 light-years distant and is slightly dimmer. While no planets have been detected, there is still plenty of company as Castor is actually a six-star system! There are several great deep-sky objects to observe as well. You may be able to spot one with your unaided eyes, if you have dark skies and sharp eyes: M35, a large open cluster near the "right foot" of Gemini, about 3,870 light-years away. It's almost the size of a full Moon in our skies! Optical aid like binoculars or a telescope reveals the cluster's brilliant member stars. Once you spot M35, look around to see if you can spot another open cluster, NGC 2158, much smaller and more distant than M35 at 9,000 light-years away. Another notable object is NGC 2392, a planetary nebula created from the remains of a dying star, located about 6,500 light-years distant. You'll want to use a telescope to find this intriguing faint fuzzy, located near the "left hip" star Wasat.

Gemini's stars are referenced quite often in cultures around the world, and even in the history of space exploration. NASA's famed Gemini program took its name from these stars, as do the appropriately named twin Gemini North and South Observatories in Hawaii and Chile. You can discover more about Gemini's namesakes along with the latest observations of its stars and related celestial objects at nasa.gov.



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NASA Night Sky Notes

February 2022



Castor and Pollux are Gemini's most prominent stars, and often referred to as the "heads" of the eponymous twins from Greek myth. In Chinese astronomy, these stars make up two separate patterns: the Vermillion Bird of the South and the White Tiger of the North. What do you see? The Night Sky Network's "Legends in the Sky" activity includes downloadable "Create Your Own Constellation" handouts so you can draw your own star stories: bit.ly/legendsinthesky

Image created with assistance from Stellarium.



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NASA Night Sky Notes

February 2022



Montage of Gemini North, located on Mauna Kea in Hawaii, and Gemini South, located on Cerro Pachón in Chile. These “twin” telescopes work together as the Gemini Observatory to observe the entire sky.

Image Credit: NOIRLab Source: <https://www.gemini.edu/gallery/media/gemini-northsouth-montage>



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2022 TDS Star Party Schedule

Date	Type	Sunset	Astro. Twi.	Moonrise(set)	Illumination [†]	Notes
Feb-5	Public	5:25 PM	6:49 PM	(10:20 PM)	26%	
Feb-26	Member	5:43 PM	7:05 PM	4:27 AM	21%	Mercury Greatest Western Elongation - Feb 16 (AM)
Mar-5	Public	5:49 PM	7:10 PM	(9:04 PM)	12%	
Mar-26	Member	7:04 PM	8:27 PM	4:13 AM	34%	
Apr-2	Public	7:09 PM	8:33 PM	(8:49 PM)	3%	
Apr-30	Member	7:29 PM	9:00 PM	6:32 AM	0%	Mercury Greatest Eastern Elongation - Apr 29 (PM)
May-21	Public	7:44 PM	9:21 PM	1:37 AM	64%	
May-28	Member	7:49 PM	9:28 PM	5:06 AM	3%	Memorial Day Weekend
Jun-18	Public	7:59 PM	9:40 PM	12:11 AM	78%	Mercury Greatest Western Elongation - Jun 16 (AM)
Jun-25	Member	8:00 PM	9:42 PM	3:43 AM	10%	
Jul-23	Public	7:53 PM	9:29 PM	2:22 AM	22%	
Jul-30	Member	7:48 PM	9:22 PM	(9:25 PM)	5%	S. delta Aquariids peak night of Jul 29-30 (ZHR ^{††} 16)
Aug-20	Public	7:27 PM	8:55 PM	1:01 AM	37%	Saturn at Opposition on Aug 14
Aug-27	Member	7:19 PM	8:45 PM	7:30 AM	0%	Mercury Greatest Eastern Elongation - Aug 27 (PM)
Sep-17	Public	6:51 PM	8:14 PM	11:40 PM	54%	Neptune at Opposition on Sep 16
Sep-24	Member	6:42 PM	8:04 PM	6:20 AM	2%	Jupiter at Opposition on Sep 26
Oct-15	Public	6:15 PM	7:37 PM	10:21 PM	71%	Mercury at Greatest Western Elongation - Oct 8 (AM)
Oct-22	Member	6:07 PM	7:29 PM	5:06 AM	8%	Orionids peak night of Oct 20-21 (ZHR ^{††} 20)
Nov-19	Public	4:45 PM	6:11 PM	2:50 AM	21%	Leonids peak night of Nov 17-18 (ZHR ^{††} 15)
Nov-26	Member	4:43 PM	6:09 PM	(7:31 PM)	12%	Thanksgiving Weekend
Dec-17	Public	4:44 PM	6:13 PM	1:34 AM	38%	Geminids peak night of Dec 13-14 (ZHR ^{††} 150)
Dec-24	Member	4:48 PM	6:16 PM	(6:21:PM)	3%	Ursids peak night of Dec 21-22 (ZHR ^{††} 10)

[†] Illumination at meridian crossing.

^{††} Published *zenithal hourly rate(s)* ZHR vary widely between sources.

AmazonSmile Donations

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Send dues and renewals to P.O. Box 23215, San Diego, CA 92193-3215 or renew on-line. The notice that your membership in SDAA will expire is sent by email. Dues are \$60 for Contributing Memberships; \$35 for Basic Membership; \$60.00 for Private Pads; \$5 for each Family membership.