

# San Diego Astronomy Association

Celebrating Over 50 Years of Astronomical Outreach



**April 2023**

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

## *Program Meeting April 19th*

Topic: Dark Matter - Observational Evidence and Experimental Searches.  
Speaker: Dr. Eric Cotner is a data scientist and theoretical astroparticle physicist.

### **Next SDAA Business Meeting**

April 11th at 7:00pm  
10070 Willow Creek Rd  
San Diego, CA 92131  
Via Zoom

### **Next Program Meeting**

April 19th at 7:00pm  
Live stream

## **CONTENTS**

April 2023, Vol LXI, Issue 4	
Published Monthly by the	
San Diego Astronomy Association	
Incorporated in California in 1963	
Program Meeting.....	1
March Minutes.....	2
Night Sky Charts.....	6
Another Look.....	10
SDAA Contacts.....	15
NASA Night Sky Notes.....	16
TDS 2023 Star Party Schedule.....	18

Dr. Cotner graduated from UCLA in 2018 with a PhD in physics under the mentorship of Alexander Kusenko. The focus of his research was exotic dark matter candidates formed from scalar condensates in the early universe, which includes Q-balls, boson stars, and primordial black holes. It is an interesting blend of particle physics, conventional astrophysics, and physical cosmology. During his graduate studies, he taught a wide variety of undergraduate physics classes, ranging from introductory physics 101 for freshman biology majors to upper-division nuclear and particle physics for advanced junior/senior physics majors. He has won multiple awards for teaching and from 2014 - 2017 was a volunteer for UCLA's Explore Your Universe program.



**The April 2023 Program Meeting will be virtual via ZOOM**

### 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>



# San Diego Astronomy Association

## *San Diego Astronomy Association Board of Directors Meeting*

*March 14, 2023* – Unapproved and subject to revision

### **1. Call to Order**

The meeting was held via Zoom and was called to order at 7:04pm with the following board members in attendance: Dave Decker, President; Kin Searcy, Vice President; Mike Chasin Treasurer; Gene Burch, Recording Secretary; Dave Wood, Director; Bee Pagarigan, Director; Hiro Hakozaki, Director; Gracie Schutze, Director; Steve Myers, Primary Grid Reconstruction committee.

### **2. Approval of Last Meeting Minutes**

The February meeting minutes were approved.

### **3. Treasurers & Membership Report**

The treasurer's report was approved. Mike reported that final numbers for the banquet were very good and we are ahead of our overall budget projections for 2022/2023. We are still working with an attorney to resolve the counterfeit check that Chase Bank cashed on our account and it looks like we will need to take legal action. Mike is also looking at dividing some of our assets between banks to make sure that we meet the FDIC insurance requirements.

### **4. Standard Reports**

#### **a. Site Maintenance Report:**

No report, although it was noted that the trench along the observatory wall remains open and unprotected.

#### **b. Observatory:**

No report.

#### **c. Loaner Scope Report:**

Five telescopes currently out (SDAA#004 Meade LX90, #023 Orion XT10, #026 Zhumell 8", #028 Bushnell Voyager 8", SDAA#027 Orion AstroView on CG-5GT). SDAA#004 was exchanged, and #023, #026, and #028 were checked out, as planned, on Feb 18. I granted the lessee of #027 an extra month due to the poor weather and his lack of ability to use the equipment.

March 18 will be the next loaner drop off and pickup at TDS. I expect to exchange #027 at that time. The remaining loans are due back in May.

A new astrophotography rig will be joining the loaner fleet. The donated Celestron CGX will be assigned to the loaner program, and Dave Decker has offered to donate an 8" f/4 astrograph to pair with it. With a few additional accessories this will make for a superb beginner-to-intermediate imaging platform for SDAA members to use.

#### **d. Private Pad Report:**

We have 7 free pads and 10 people on the waiting list (one who is looking to upgrade).



# San Diego Astronomy Association

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e. Program Meetings Report:

March meeting will be Zoom only vice hybrid. April speaker is Eric Cotner whom we met at MTRP star party. IDA will have a slot also. Still working on a speaker for May (Zoom again). Next in-person program meeting will be June with Tim Thompson from Mt. Wilson and JPL. That will be hybrid.

Greater San Diego Science and Engineering Fair Professional society judging is Wednesday, 15 March. Review of the project material available on the fair showcase site indicated that we have a good crop of entries, including two past SDAA winners.

f. AISIG Report:

Dave Wood is working to get AISIG restarted.

g. Newsletter Report:

As always, the newsletter looks great – Thanks, Andrea!

h. Website Report:

Steve Myers reported that he is making progress on switching our email accounts to Google Workspace for Non-Profits. This is the first part of a long-term goal of consolidating our digital assets in one place and making access to them easier as Board members change.

i. Social Media:

No report

j. Outreach Report:

1. Foul weather again played havoc with our SDAA outreach events for the month of February, it was almost a duplicate of last month. We had to cancel a total of 7 activities, they were: two schools, TDS Public Night, Oakoasis County Park, Borrego Springs Library, Stars at West Sycamore, and K.Q. Ranch (covered with snow).

2. On the positive side, the five grade schools were so grateful to SDAA for supporting their Science/Astronomy Night(s)! They were: Rancho Elementary, Curie Elementary, Chula Vista Middle, Fuerte Elementary, and Morning Creek Elementary School(s). We almost cancelled Morning Creek Elementary because of clouds, but Dave Whigham and Sonny Adams were able to keep Jupiter in their crosshairs for one hour before this planet dropped into the tree line and cloud layer. Same for Fuerte Elementary as everyone was fighting the clouds that night, but gave the children three planets to see.

3. The big event for February was Comet C2022 E3 (ZTF) at Stars-in-the-Park on February 1st as noted in last month's report, with record breaking attendance. This report overlaps last month's reporting period in that the months are now covered from the first day to the last day of a given month.



# San Diego Astronomy Association

4. One rare event was Agua Caliente County Park on February 18th and 19th, requested by Ranger Cody Ambrose. Dennis Ammann, SDAA Outreach Director, was surprised at how many SDAA astronomers drove the 180-mile r/t and showed up on Saturday night in support of his Constellation Talk. Besides Dennis, the other four were: Bill Cecil, Craig Storms, Edwin Wilks, and Damon Blackman; all sharing the dark desert night sky with about 120 campers. Sunday night was a reduced audience of 50 campers, because of cloudy skies, with many campers leaving early during Presidents Day Weekend. Dennis soloed Sunday night, conducting the Constellation Talk and providing a look through his 12" Dob.

2023	February	YTD
Events Completed	9	14
Events Cancelled	7	15
Total Attendance	1280	1700

k. TARO Report:

Taro report – A trip up the hill found two major problems with the system. The primary server computer was in the process of failing. A refurbished main frame CPU has been purchased and will be installed the next trip up the hill. The Imaging train rotator was also found to be in need of service. An RMA was issued by Optec, and the rotator has been sent back for repair and servicing.

l. Cruzen Report:

The February excursion was successful, with Bee and I adding numerous finishing touches to the observatory. The concrete pad outside the south door was poured, red lamps were added to the desks, initial testing of the donated laptop + Stellarium to control the G11 was performed, and extensive notes were collected regarding use of the observatory. The observatory was cleaned, vacuumed, wiped down, and all the non-essential items were removed. These notes were translated into a rough draft of the full Cruzen Operations Manual, a 30-page *tour de force* that covers everything from facilities information to telescope operation to safety considerations.

During the March excursion Bee and I will take additional photos to flesh out the documentation, as well as complete the laptop configuration with the G-11. One more red LED lighting circuit needs to be installed in the storage cabinet, and some additional comfort items such as floor mats, grease board, visitor log, and a second stepladder, will be added. We will perform one more run-through of the documentation to verify that we didn't miss too much. We will also get information about Cruzen posted on the SDAA website and begin reaching out to initial beta testers.

If all goes to plan, in April we will have the beta testers (5-10 hand-picked members) join us for the first training session. These testers will then have the ability to use the observatory for several weeks, reporting maintenance/usability issues and documentation defects. After 8-12 weeks of beta testing, we will officially open the observatory to the membership, hosting the first formal training session for all eligible SDAA members. Training sessions will be held 2-3 times per year, and members who complete the training will be able to access a shared Google Calendar to reserve the facility.



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Unless there are objections from the board, the requirements for SDAA members to make use of Cruzen will be as follows:

- Contributing Full Member status in good standing
- At least one full year of tenure
- Completed Cruzen training no more than 3 years ago

This information, as well as guidance on how to attend training, rules for the facility, a link to the operations guide, and guidance on making reservations, will be available on the SDAA website. The reservation calendar will only be accessible by Cruzen-certified members.

m. Merchandise Report:

No sales in February.

n. Astronomical League Report:

Nothing to report.

o. JSF Report:

Bill Cecil has agreed to head up the Julian Star Fest in 2023. The Board assured Bill that we will support him and we will be looking for volunteers to help make the event another success. The first plan will be for Bill to get in touch with Dan and Sandy Kiser who did such a great job with JSF the last few years. He will also contact the Menghini Winery to find available dates.

p. Primary Grid Reconstruction Report:

Grid rebuild report – a meeting has been set for March 17 with the electrical engineer in order to discuss current system design status and moving forward on a consulting contract with his company.

## 5. Old Business:

- |    |  |        |
|----|--|--------|
| a. | Google Workspaces for Non-Profits – see website report   | Myers  |
| b. | JSF Coordinator – see JSF  | Decker |
| c. | Other old business – Gate – Mike Chasin reported that the one vendor who had made a reasonable quote has withdrawn their bid, and due to lack of responses from other companies, we're going to put the project on hold. | Decker |

## 6. New Business:

- |    |   |        |
|----|---|--------|
| a. | Funds Diversification – see Treasurers Report                     | Chasin |
| b. | Other new business – Spring Clean-up tentatively set for May 20th | Decker |

## 7. Adjournment: The meeting was adjourned at 8:53pm.

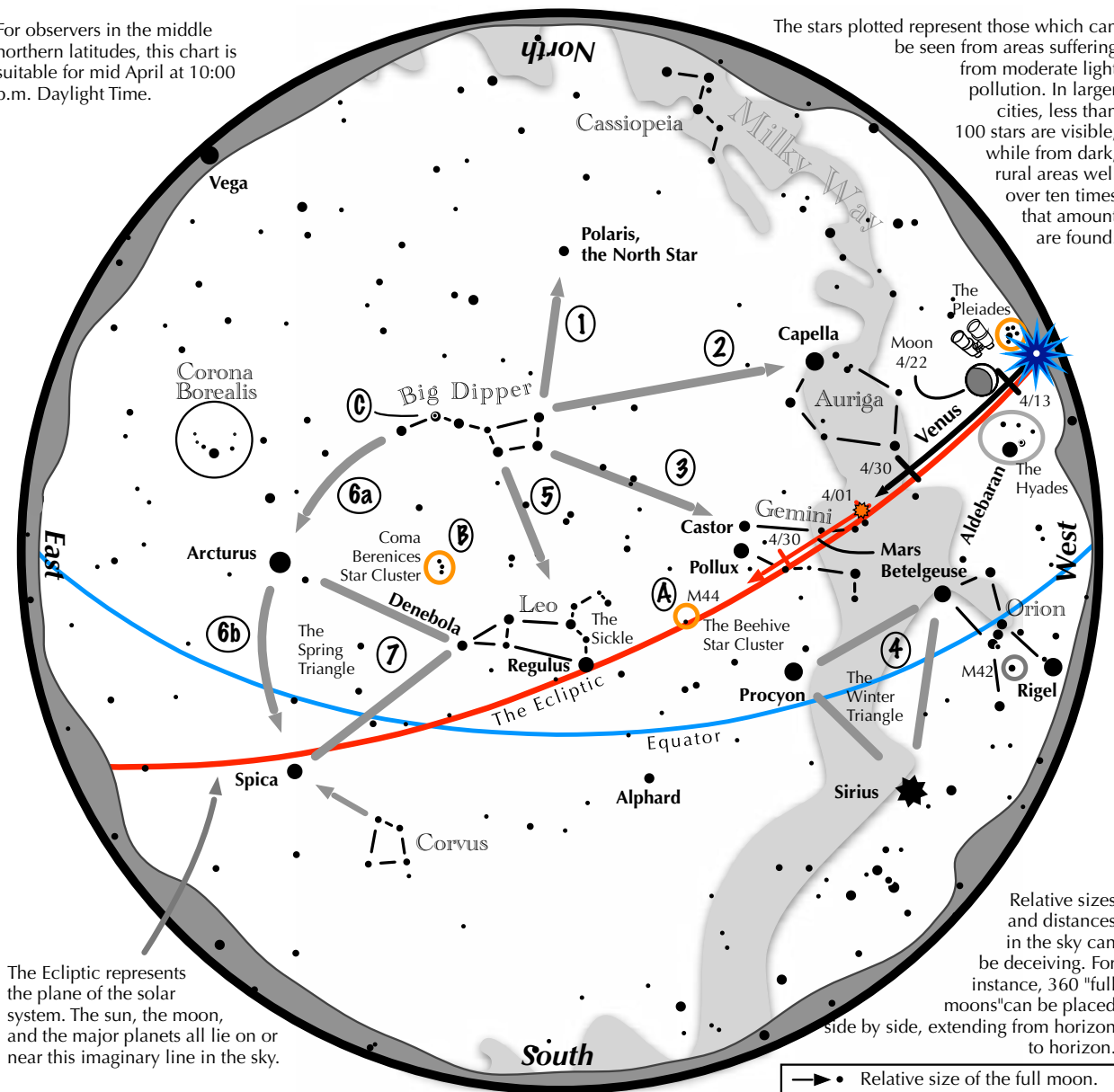


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## Navigating the April Night Sky, Northern Hemisphere

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

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.



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

- 1 Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
- 2 Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
- 3 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 4 Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
- 5 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 6 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
- 7 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

#### Binocular Highlights

- A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.  
B: Look nearly overhead for the loose star cluster of Coma Berenices.  
C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.



Astronomical League  
[www.astroleague.org/outreach](http://www.astroleague.org/outreach)

Duplication allowed and encouraged for all free distribution.



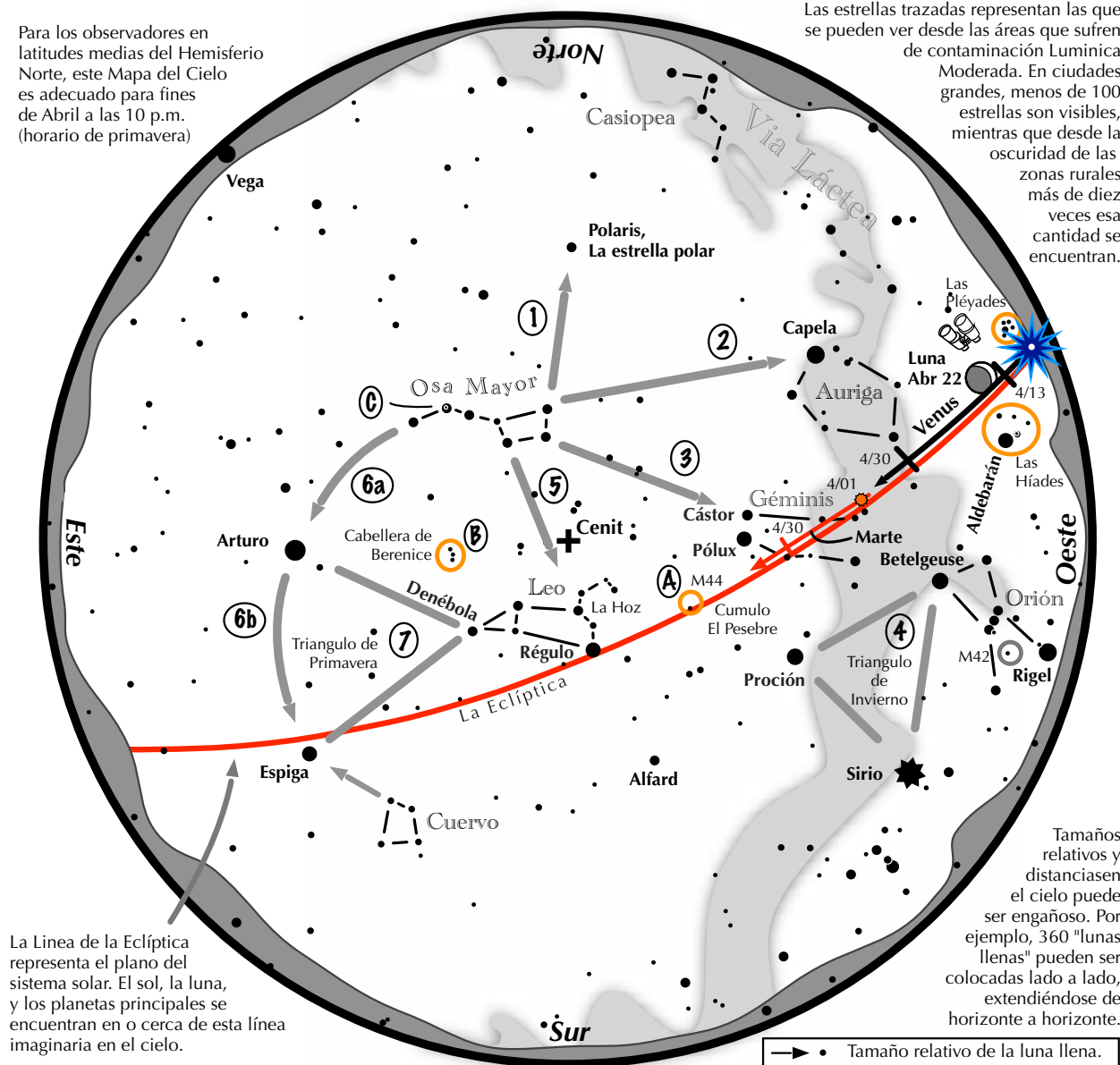


# San Diego Astronomy Association

## Navegando por el cielo nocturno de Abril

Para los observadores en latitudes medias del Hemisferio Norte, este Mapa del Cielo es adecuado para fines de Abril a las 10 p.m. (horario de primavera)

Las estrellas trazadas representan las que se pueden ver desde las áreas que sufren de contaminación lumínica 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 Haz una línea hacia el norte desde las dos estrellas en la punta de la Osa Mayor. Pasa por Polaris, la estrella polar.
- 2 Haz una línea a través de las dos estrellas superiores de la punta del tazón de la Osa Mayor. Llegaras a Capela en el noroeste.
- 3 A través de las dos estrellas diagonales de la Osa Mayor, dibuja una línea que apunta a las estrellas gemelas de Cástor y Pólux en Géminis.
- 4 Busque en el oeste-suroeste las brillantes estrellas del Triángulo de Invierno de Sirio, Proción y Betelgeuse.
- 5 Directamente debajo del tazón de la Osa Mayor se encuentra Leo con su estrella principal, Régulo.
- 6 Siga el arco del mango del tazón de la Osa Mayor. Primero cruza Arturo, luego continúa hacia Espiga, luego Cuervo.
- 7 Arturo, Espiga y Denébola forman el triángulo de primavera, un gran triángulo equilátero.

### Puntos destacados con binoculares

A: M44 (Cumulo El Pesebre), un cúmulo de estrellas apenas perceptible a simple vista, se encuentra al sureste de Pólux. B: Mira alto en el este para ver el cúmulo de estrellas perdidas de Cabellera de Berenice. C: Mizar brilla junto a una estrella más tenue, Alcor.

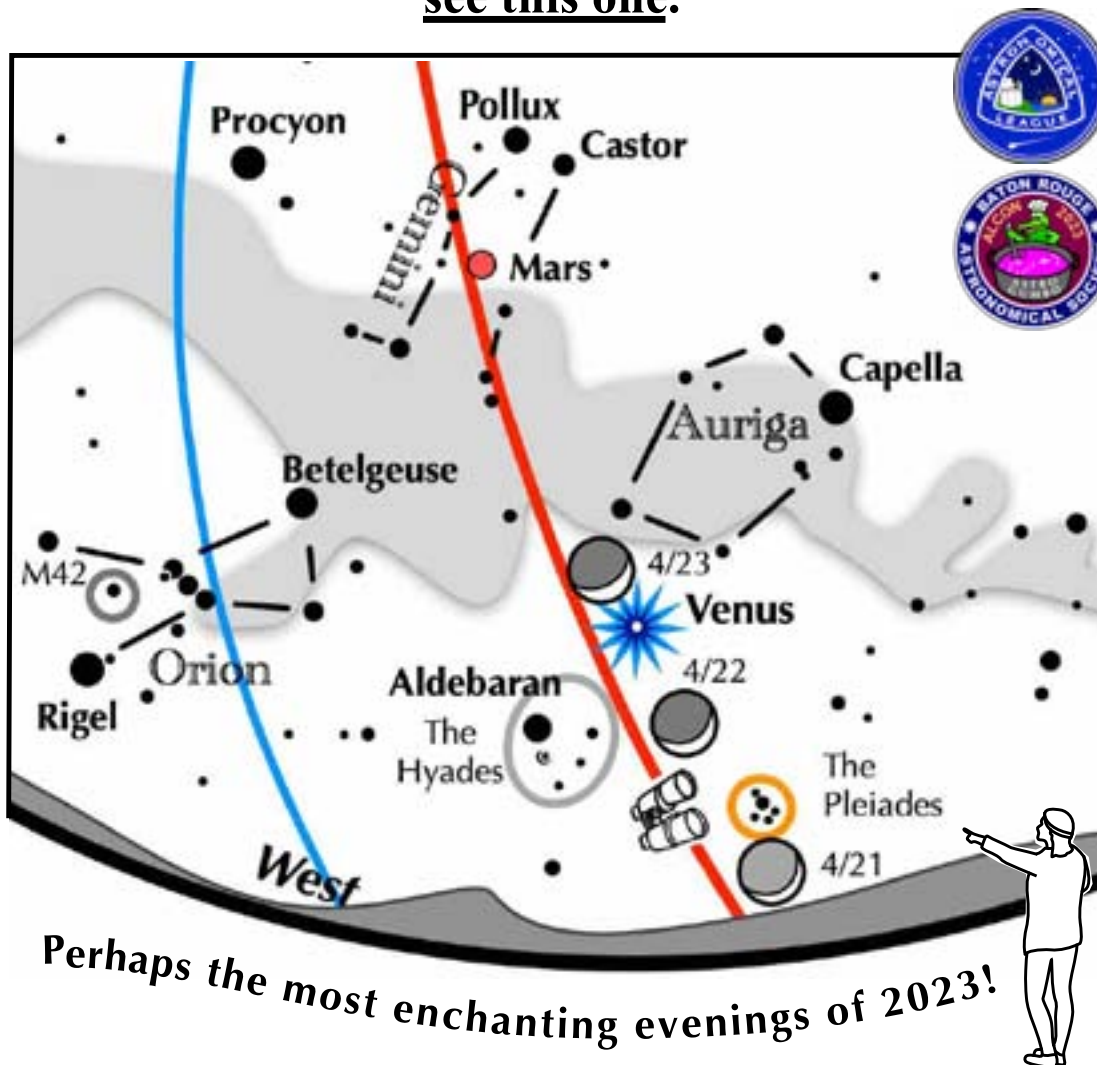


Liga Astronómica  
[www.astroleague.org](http://www.astroleague.org)  
/outreach

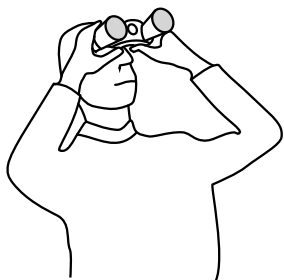


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If you can see only one celestial event this April,  
see this one.



*Perhaps the most enchanting evenings of 2023!*



Enhance the scene –  
use binoculars!

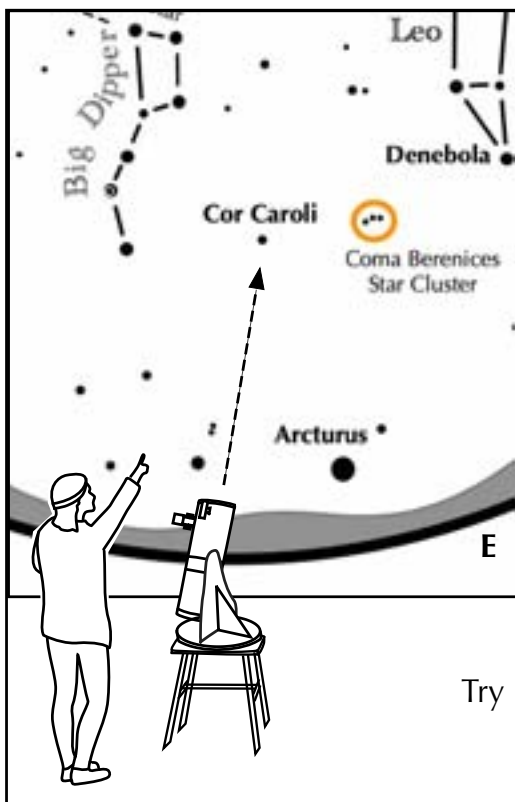
On April 21, 22, and 23, look low in the west-northwest 60 minutes after sunset.

- The crescent moon, glowing full with earthshine, floats just above the horizon in the bright twilight on April 21. Above it, lies the pretty Pleiades star cluster.
- On April 22, the slightly thicker, but more pronounced crescent moon moves between brilliant Venus and the Pleiades, and right of the Hyades star cluster.
- On the third night, the crescent moon stands commandingly above the scene.





# San Diego Astronomy Association



## Other Suns: Cor Caroli



### How to find Cor Caroli on an April evening

Look northeast toward the Big Dipper. A star, slightly dimmer than the handle stars, is placed near the center of the handle's curvature. That is Cor Caroli.

Suggested magnification: >20x

Suggested aperture: >2 inches

### Cor Caroli

A-B separation: 19 sec

A magnitude: 2.9

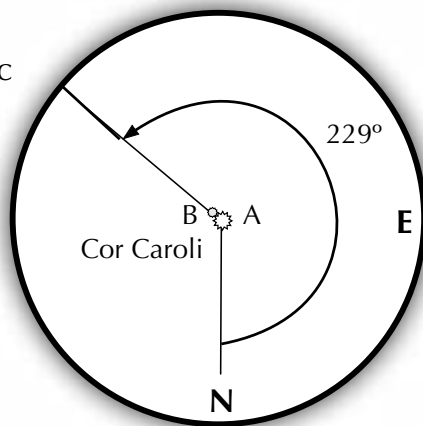
B magnitude: 5.5

Position Angle: 229°

A color: white

B color: pale blue

Try using steadily held and sharply focused 10x50 binoculars.





# San Diego Astronomy Association

## *Another Look*

April 2023 Another Look

Full Moon April 6, New Moon April 20

Native American call this the Red Grass moon, the Budding moon and the Flowering moon.

Other tribes called it the Fish moon, the Frog moon and the Breaking Ice moon.

Northeastern Native American tribes called it the Sugar Bush moon and the Sugar Maker moon.

In Islamic culture the night of the April Full Moon is called the Night of Innocence, Christians refer to the first full moon after Easter as the Paschal moon.

Today, we call the April Full Moon the Pink moon.

Leo Minor wasn't known as such in antiquity. Ptolemy didn't ascribe that area between the feet of Ursa Major and Leo as anything more than amorphous. The faint stars there generally assigned to Leo.

*Albrecht Dürer 1515*



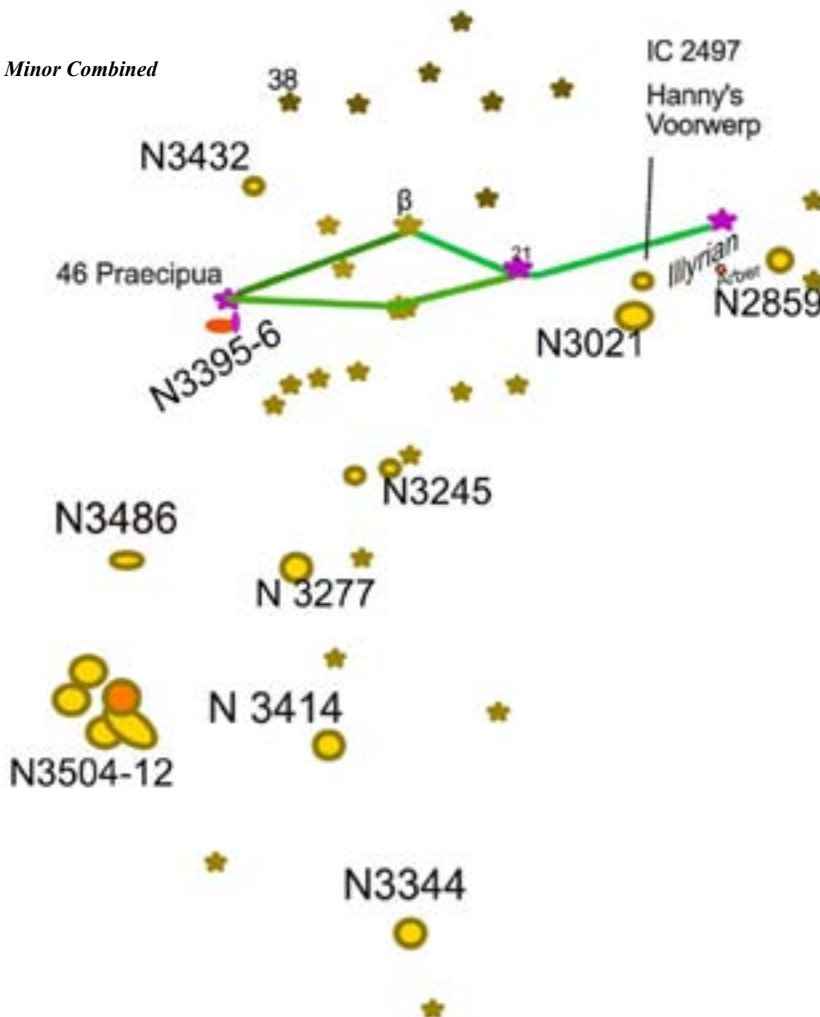
*Hevelius Leo Minor Combined*



Polish Astronomer and Cartographer Johannes Hevelius added the outline of a small lion between the drawing of the Great Bear and Leo. Later, Bayer added a Greek letter to one of the stars and Draper numbered many more.

Leo Minor has two named stars. The one, 46 Leonis Minoris has the name Praecipua and is the brightest star in LMi. The other is an 8<sup>th</sup> magnitude star with the Draper designation HD 82886 named Illyrian. The International Astronomical Union thought to give each country its own star and planet and HD 82886 was given to Albania. The Illyria were the ancient people of the Balkans and the Arber, its planet, the medieval name of the people of Albania.

One of the more interesting objects in Leo Minor is Hanny's Voorwerp. IC 2497 is 15<sup>th</sup> magnitude and I read that Hanny's Voorwerp is as faint as 19<sup>th</sup> magnitude. IC 2497 is a possibly great





# San Diego Astronomy Association

inclusion into our catalog of potential black holes. A decently condensed explanation of the physics can be found at: <http://cseligman.com/text/atlas/ic24a.htm#ic2497>.

<https://www.flickr.com/photos/avdhoeven/15741726033/in/photolist-5nqpdg-8ZPD0H-qsIEyW-rpiZp2-nn3TTy-99ABqD-wuaz1n-r1K45z-wM7mJh-6VwnkE-pZ3sHx-99uoLC-nrH8r7-ff7cPa-rEYeRY-rXu547-qxqvAq-F6DV6Y-kjHA1M-s91CpL-QZPzSC-r1x1So-ovEpXp-rF5XRg-LL5aAW-rF61fV-r1wZY9>



There are a couple of 10<sup>th</sup> magnitude galaxies in Leo Minor: NGC 3344 and NGC 3486. Both galaxies are face on and may be slightly barred in the case of N3486. N3344 is great but will take some star hopping skills to find it out there in the reaches of no-man's land. [hla.stsci.edu/cgi-](http://hla.stsci.edu/cgi-bin/display?image=hst_09042_44_wfpc2_f8...(color)%20NGC3486)



[bin/display?image=hst\\_09042\\_44\\_wfpc2\\_f8...\(color\)%20NGC3486](http://hla.stsci.edu/cgi-bin/display?image=hst_09042_44_wfpc2_f8...(color)%20NGC3486)

On the other side of Leo Min is Abell 779 and NGC 2859. A cluster of galaxies close to 11<sup>th</sup> magnitude N2859 and also alpha  $\alpha$  Lyncis.

<https://www.flickr.com/photos/113933437@N06/11961961204/in/photolist-2mzX9HH-2npX8y3-fH4csT-SxBHrX-Riyrkp-2kKM6du-riq6LG-2hsMriW-sVFvXW-2hsOaXh-exXzEZ-je3bjq-GoEwcJ-RLd5Nv>

It is common knowledge that Ursa Major has from prehistoric times been known as a Bear. I have read, however, that apparently this knowledge is uncommonly wrong. Among the different civilizations that grew in and around the confluence of the Tigris and Euphrates rivers that we typically think of as Mesopotamia and Babylonia, the asterism was known as “the constellation of the Long Chariot.” (The Origin of Ursa Major, Davis, G.A. Jr. 1946.) Likewise, per Davis, neither the Chinese, Egyptians, Arabs, or Persians had a bear. Also, even the Anglo-Saxon and Teutonic almost universally referred to it as a “Wain”, Wagon or in modern idiom, a plow. Whence then, you ask, the bear. Per Davis, a series of linguistic misconceptions and misspellings going as far back as Sanskrit has caused the constellation's parts, identified in antiquity as “stars” to become “bears”. This isn't an unusual circumstance, actually. We can find translation errors in our star names and constellations even as recently as Arabic to Latin and vice-versa.

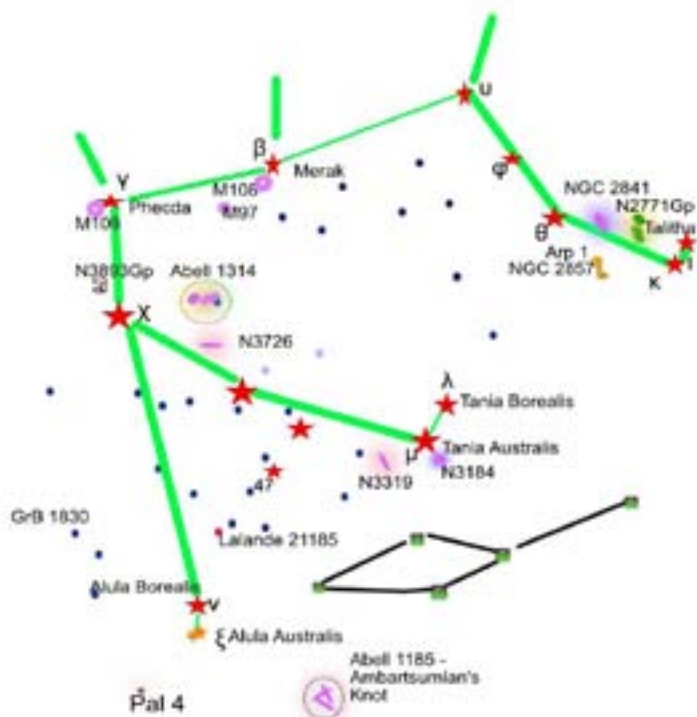




# San Diego Astronomy Association

Common or uncommon knowledge aside, the idea of a bear in the sky permeated the beliefs of cultures throughout history. I find it unlikely that the concept of a nation descending from an animal would pop up all over the world without social dissemination. Historians list too many native American nations identifying with animal ancestors for it to be coincidence. In the thousands of years of humanity's existence from Lucy to the pyramids of the Aztecs; ideas, knowledge and concepts traveled along with their herds up into Europe, west as far as Iceland and Greenland, and east and across the land bridge into the Americas. <http://judy-volker.com/StarLore/Art/HarmoniaMacrocosmica.html> -

This is some awesome astronomy artwork; you should take a look.



So, that brings us to the Greeks and Callisto and Arcas, mother and son transported into the heavens to become the greater and the lesser bear.

*Jove — snatched them through  
the air*

*In whirlwinds up to heaven and  
fix'd them there;*

*Where the new constellations  
nightly rise,*

*And add a lustre to the northern  
skies.*

**Ovid's "Metamorphoses"**

Normally we look at Ursa Major and see only the ladle. There are so many objects near, on and in the asterism that we can spend hours searching for large, small and interesting galaxies and globular clusters as well as a famous planetary nebula. But as you can see by the chart I made and the drawing of Ursa Major by Jordanis (<http://judy-volker.com/StarLore/Art/HarmoniaMacrocosmica.html>) showing his Jordan River between UMa and Leo, the legs and feet of Ursa are a treasure trove of bright, interesting and unusual stars and galaxies.

One very interesting star in Lalande 21185, at 7<sup>th</sup> magnitude the brightest red dwarf in the northern skies. It's down by the left rear foot of Ursa, close to Alula Borealis and Alula Australis. L21185 is very close to us and in the next ice age should be almost as close Alpha Centari. L21185 also has a couple of planets with long histories of discovery, disapproval and rediscovery.

Another very interesting star is Groombridge 1830. Also, near but on the other side of Ursa's paw, Gmb 1830 has a big proper motion and based on its distance from the sun, the highest proper motion we've measured so far. Gmb 1830 is a "halo" star, meaning it is rotating counter to our galaxies rotation and has probably an eccentric orbit around the Milky Way.





# San Diego Astronomy Association

Alula Borealis is Nu  $\nu$  Ursae Majoris and Alula Australis is Xi  $\xi$  Ursae Majoris and their names come from the Arabs as the “first leaps of the gazelle”. Both Nu and Xi are double. Nu is 3<sup>rd</sup> mag. And Xi is 4<sup>th</sup>. Nu is an easier double to split with our backyard telescopes.

Two objects also by the paw is Palomar 4, a very challenging globular and Abell 1185 a swarm of 13<sup>th</sup>, 14<sup>th</sup> and fainter galaxies. At least one, NGC 3550 appears to be a merge of at least two galaxies. Part of Abell 1185 is Ambartsumian’s knot, a small dot under 14<sup>th</sup> magnitude NGC 3561 that they think is a dwarf companion galaxy. Pol 4, like all Palomar globulars is tough. Its combined magnitude is given as 14, so your big scopes can find it, seeing it is another thing. It is faint and diffuse, but once you’ve identified it visually all you can say is “Wow”.

Tania Borealis and Tania Australis –  $\lambda$  (Lambda) and  $\mu$  (Mu) Ursae Majoris – “the second leap”, mark the right rear paw. They are both 3<sup>rd</sup> magnitude.

Talitha Borealis and Talitha Australis –  $\iota$  (Iota) and  $\kappa$  (Kappa) Ursae Majoris – “the third leap”, mark the front paw of Ursa. Both stars are 3<sup>rd</sup> magnitude. Kappa is a double system while Iota is a system with two double stars. The main star is 3<sup>rd</sup> magnitude while the companions are 9<sup>th</sup>, 10<sup>th</sup>, and spectroscopic.

Moving up into Ursa Major we have three Messier’s near the stars marking the hips of the bear. Messier 97, Messier 106 and Messier 108

[https://ocastronomers.org/wp-content/uploads/2018/12/M97-108\\_LA\\_31012007.jpg](https://ocastronomers.org/wp-content/uploads/2018/12/M97-108_LA_31012007.jpg)

[Larry Arnold](#)

[Arnie Rosner](#)

[https://ocastronomers.org/wp-content/uploads/2018/12/m109\\_01-28-03\\_150.jpg](https://ocastronomers.org/wp-content/uploads/2018/12/m109_01-28-03_150.jpg)

[https://ocastronomers.org/wp-content/uploads/2018/12/M51\\_LRGB\\_12-08-02\\_150.jpg](https://ocastronomers.org/wp-content/uploads/2018/12/M51_LRGB_12-08-02_150.jpg)

[Arnie Rosner](#)

Two very nice galaxies and one of the most famous planetary nebulas in the sky. As long as you are up there, move 14 degrees west to the area around the tail star, Alkaid, and find M51, technically in Canes Venatici, one of the most spectacular galaxies we can see.





# San Diego Astronomy Association

All three images in the mosaic can be found by following the links to the OCA website.

<https://ocastronomers.org/wp-content/uploads/2018/12/spring-galaxies2008-r3.Jpg> Bill Hall

Moving over to the 3<sup>rd</sup> magnitude theta  $\theta$  Ursae Majoris, the front “knee” are three objects of interest, one quite bright and the other two a bit of a challenge. NGC 2841 is 10<sup>th</sup> magnitude and tilted obliquely to us as the image by Bill Hall shows. Very close is the NGC 2771 group halfway between  $\theta$  and  $\iota$ , 3<sup>rd</sup> magnitude Talitha. I don’t suppose this group of galaxies has ever been officially named after NGC 2771, but a look though the NGC or Simbab will show four galaxies from, 12<sup>th</sup> to 15<sup>th</sup> magnitudes clustered together. Be sure to check out NGC 2769, a close neighbor, lenticular with a large dark lane.

Across from theta about 40 percent of the way to kappa, also 3<sup>rd</sup> magnitude, is number one on Arp’s List of Peculiar Galaxies. NGC 2857, it is a 2’ by 2’ face on open spiral that made Apr’s list because of its low surface brightness.

The left rear paw of UMa is made up of 3<sup>rd</sup> magnitude Tania Boraalis,  $\lambda$ , and 3<sup>rd</sup> magnitude double Tania Australis,  $\mu$ . There are a number of galaxies around the two stars, among the brightest are NGC’s 3202, 3205 and 3207. A little further up the leg is NGC 3319, an 11<sup>th</sup> magnitude barred spiral.

<https://www.flickr.com/people/detterline/>

Right next to mu  $\mu$ , is the magnificent 10<sup>th</sup> magnitude NGC 3184, the little pinwheel. This 7’ by 7’ face on spiral even has its own NGC’s embedded, just like its large cousin. Joel Kuiper at <https://astrophotography.nl/>

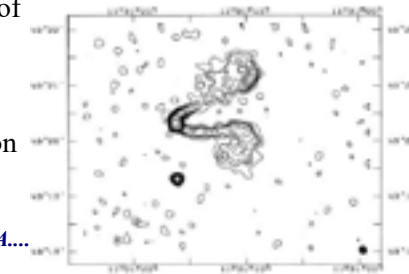


Up near Xi,  $\chi$ , Uma are three areas of interest. Abell 1314 is a cluster of hundreds of galaxies centered on a trio of 13<sup>th</sup> and 14<sup>th</sup> magnitude galaxies, one with the unusual name of Papillon, IC 708 and next door to IC 709 and IC 712. Papillon is 13<sup>th</sup> magnitude, IC 709 is almost 14<sup>th</sup> magnitude and IC 712 is 14<sup>th</sup>. Papillon is unremarkable visually but got its name from its energy intensity map.

<https://articles.adsabs.harvard.edu/pdf/1979A&A....77..183V>

Nearby is NGC 3726, 10<sup>th</sup> magnitude and 7 min. NGC 3893 is an 11<sup>th</sup>-magnitude spiral galaxy. The small faint galaxy to the upper right is NGC 3896, a 14<sup>th</sup> magnitude spiral, while the small round galaxy in the lower right corner is MCG 8-22-9. This is a 60-second image taken on 12 March 1994 at 07:55 UT.

Image at: [https://ocastronomers.org/wp-content/uploads/2018/12/NGC3893\\_20150418\\_CE\\_01.jpg](https://ocastronomers.org/wp-content/uploads/2018/12/NGC3893_20150418_CE_01.jpg)



Dark Skies,  
Dave Phelps





# San Diego Astronomy Association

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# San Diego Astronomy Association

NASA Night Sky Notes

April 2023



**This article is distributed by NASA's Night Sky Network (NSN).** The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

## Solar Eclipses Are Coming!

David Prosper

Have you ever witnessed a total solar eclipse? What about an annular solar eclipse? If not, then you are in luck if you live in North America: the next twelve months will see two solar eclipses darken the skies for observers in the continental United States, Mexico, and Canada!

Solar eclipse fans get a chance to witness an **annular eclipse** this fall. On **Saturday, October 14, 2023**, the Moon will move exactly in front of the Sun from the point of view of observers along a narrow strip of land stretching across the United States from Oregon to Texas and continuing on to Central and South America. Since the Moon will be at its furthest point in its orbit from Earth at that time (known as *apogee*), it won't completely block the Sun; instead, a dramatic "ring" effect will be seen as the bright edge of the Sun will be visible around the black silhouette of the Moon. The distinct appearance of this style of eclipse is why it's called an annular eclipse, as *annular* means *ring-like*. If you are standing under a tree or behind a screen you will see thousands of ring-like shadows projected everywhere during maximum eclipse, and the light may take on a wan note, but it won't actually get dark outside; it will be similar to the brightness of a cloudy day. This eclipse must only be observed with properly certified eclipse glasses, or other safe observation methods like pinhole projection or shielded solar telescopes. Even during the peak of the eclipse, the tiny bit of the Sun seen via the "ring" can damage your retinas and even blind you.

Just six months later, a dramatic **total solar eclipse** will darken the skies from Mexico to northeast Canada, casting its shadow across the USA in a strip approximately 124 miles (200 km) wide, on **Monday, April 8, 2024**. While protection must be worn to safely observe most of this eclipse, it's not needed to witness totality itself, the brief amount of time when the Moon blocks the entire surface of the Sun from view. And if you try to view totality through your eclipse viewer, you won't actually be able to see anything! The Moon's shadow will dramatically darken the skies into something resembling early evening, confusing animals and delighting human observers. You will even be able to see bright stars and planets - provided you are able to take your eyes off the majesty of the total eclipse! While the darkness and accompanying chilly breeze will be a thrill, the most spectacular observation of all will be the Sun's magnificent *corona*! Totality is the only time you can observe the corona, which is actually the beautiful outer fringes of the Sun's atmosphere. For observers in the middle of the path, they will get to experience the deepest portion of the eclipse, which will last over four minutes - twice as long as 2017's total solar eclipse over North America.

While some folks may be lucky enough to witness both eclipses in full – especially the residents of San Antonio, Texas, whose city lies at the crossroads of both paths – everyone off the paths of maximum eclipse can still catch sight of beautiful partial eclipses if the skies are clear. The Eclipse Ambassadors program is recruiting volunteers across the USA to prepare communities off the central paths in advance of this amazing cosmic ballet. Find more information and apply to share the excitement at [eclipseambassadors.org](https://eclipseambassadors.org). NASA has published a fantastic Solar Eclipse Safety Guide which can help you plan your viewing at [bit.ly/nasaclipsesafety](https://bit.ly/nasaclipsesafety). And you can find a large collection of solar eclipse resources, activities, visualizations, photos, and more from NASA at [solarsystem.nasa.gov/eclipses](https://solarsystem.nasa.gov/eclipses)



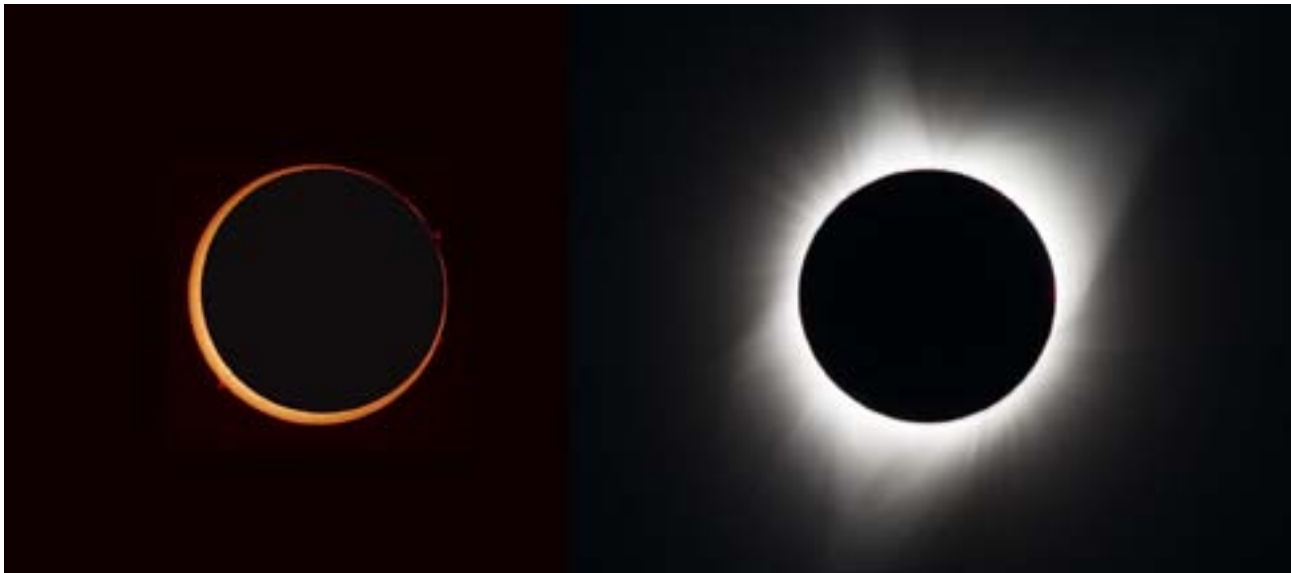
# San Diego Astronomy Association

NASA Night Sky Notes

April 2023



This detailed solar eclipse map shows the paths of where and when the Moon's shadow will cross the USA for the upcoming 2023 annular solar eclipse and 2024 total solar eclipse, made using data compiled from multiple NASA missions. Where will you be? This map is very detailed, so if you would like to download a larger copy of the image, you can do so and find out more about its features at: <https://svs.gsfc.nasa.gov/5073> Credits: NASA/Scientific Visualization Studio/Michala Garrison; eclipse calculations by Ernie Wright, NASA Goddard Space Flight Center.



Photos of an annular total solar eclipse (left) and a total solar eclipse (right). Note that the annular eclipse is shown with a dark background, as it is only safe to view with protection – you can see how a small portion of the Sun is still visible as the ring around the Moon. On the right, you can see the Sun's wispy corona, visible only during totality itself, when the Moon completely – or totally - hides the Sun from view. A total solar eclipse is only safe to view without protection during totality itself; it is absolutely necessary to protect your eyes throughout the rest of the eclipse! Credits: Left, Annular Eclipse: Stefan Seip (Oct 3, 2005). Right, Total Eclipse, NASA/Aubrey Gemignani (August 21, 2017)



# San Diego Astronomy Association

## 2023 TDS Star Party Schedule

Date	Type	Sunset	Astro. Twi.	Moonrise(set)	Illum. <sup>†</sup>	Notes	Hosts
4/15/2023	Member	7:18 PM	8:44 PM	4:29 AM	24.8%	Mercury at greatest eastern elongation. (4/11)	Jerry Hilburn
4/22/2023	Public	7:23 PM	8:51 PM	(10:27 PM)	8.6%	Lyrids peak night Apr 22-23 (ZHR 18)	Paul Krizak
5/13/2023	Public	7:39 PM	9:13 PM	3:03 AM	38.5%		
5/20/2023	Member	7:43 PM	9:20 PM	(9:14 PM)	1.6%	Mercury at greatest western elongation. (5/29)	Jerry Hilburn
6/10/2023	Public	7:56 PM	9:37 PM	1:36 AM	52.8%	Venus at greatest eastern elongation. (6/4)	
6/17/2023	Member	7:58 PM	9:40 PM	8:03 PM	0.3%		
7/8/2023	Public	7:59 PM	9:39 PM	12:07 AM	67.3%		Per Martin
7/15/2023	Member	7:57 PM	9:35 PM	4:36 AM	3.9%		
8/12/2023	Public	7:36 pm	9:06 PM	3:26 AM	12.2%	Perseids peak night of Aug 12-13 (ZHR 100)	Ed Rumsey
8/19/2023	Member	7:29 PM	8:57 PM	(9:23 PM)	10.9%	Saturn at Opposition. (8/27)	
9/9/2023	Public	7:02 PM	8:26 PM	2:17 AM	24.5%		
9/16/2023	Member	6:53 PM	8:16 PM	(7:52 PM)	3.0%	Neptune at Opposition. (9/19)	
10/7/2023	Public	6:25 PM	7:47 PM	1:07 AM	40.2%	Draconids Meteor Shower. (10/7)	
10/14/2023	Member	6:16 PM	7:38 PM	(6:22 PM)	0.0%	Annular Solar Eclipse. (partial here)	
11/4/2023	Public	5:55 PM	7:18 PM	11:54 PM	57.8%	Taurids peak night Nov 4-5. (ZHR 5)	
11/11/2023	Member	4:49 PM	6:14 PM	5:34 AM	2.8%	Uranus at Opposition - Nov 13	
12/9/2023	Member	4:42 PM	6:10 PM	4:22 AM	12.0%	Mercury at greatest eastern elongation. (12/4)	
12/16/2023	Public	4:44 PM	6:12 PM	(8:54 PM)	20.1%	Geminids peak night Dec 13-14 (ZHR 150)	

<sup>†</sup> Illumination at meridian crossing.

<sup>††</sup> Published *zenithal hourly rate(s)* ZHR vary widely between sources.

SDAA is now registered with the employer fund-matching platform Benevity. If your workplace offers matching charitable donations for non-profits and uses Benevity to distribute funds, you can now designate the San Diego Astronomy Association. Thank you for supporting the SDAA!

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