
San Diego Astronomy Association

Celebrating Over 50 Years of Astronomical Outreach



May 2024

<https://www.sdaa.org/>

A Non-Profit Educational Association
P.O. Box 23215, San Diego, CA 92193-3215



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Next SDAA Business Meeting

May 14th at 7:00pm
10070 Willow Creek Rd
San Diego, CA 92131
Via Zoom

Next Program Meeting

May 15th
Mission Trails Regional Park
Visitor and Interpretive Center
1 Father Junipero Serra Trail

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San Diego Astronomy Association
Incorporated in California in 1963

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Newsletter Deadline

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

May 15th Program

Topic: A Brief Introduction to Radio Astronomy and Some Powerful, Affordable Radio Telescopes You Can Put in Your Backyard without Irritating Your Family or Neighbors!

Speaker: Curt Kinghorn

The branch of Astronomy called Radio Astronomy uses radio waves instead of visible light to look at the sky. Interestingly, most of what we know about the universe comes from Radio Astronomy.

This presentation gives a brief introduction to Radio Astronomy, introduces projects (including participating in a worldwide citizen science project run by Stanford!) you can do with powerful Radio Telescopes that cost a few hundred dollars and can be set up in your backyard (without irritating your family or neighbors!) and will show you the results you can get (e.g., images of the spiral arms of our own Milky Way galaxy through the dust that blocks our optical view!) regardless of your skill level.



The meeting will be held via Zoom. See <https://sdaa.org/program-meeting/>

<https://us02web.zoom.us/meeting/register/tZMude-sqz4sGN1qXv7qSIBwnYp-gaQEZZ8LU#/registration>

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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San Diego Astronomy Association Board of Directors Meeting April 16, 2024 – Unapproved and subject to revision

1. Call to Order

The meeting was held via Zoom and was called to order at 7:09pm with the following board members in attendance: Dave Decker, President; Bee Pagarigan, Vice President; Mike Chasin, Treasurer; Gene Burch, Recording Secretary; David Wood, Corresponding Secretary; Hiro Hakozaki, Director; Gracie Schutze, Director; Kin Searcy, Director; Steve Myers, Director; member Curt Kinghorn.

2. Approval of Last Meeting Minutes

The March meeting minutes were approved.

3. Treasurers & Membership Report

Mike reported that membership dropped a little bit last month. He has reimbursed Steve Myers for work that's being done on the Lipp/Warming room building and has paid the science fair winners. He also renewed our Cyber insurance and Directors & Officers insurance, and overall, we're looking good.

4. Standard Reports

a. Site Maintenance Report:

LIPP/Warming Room Building Improvements – Main Scope of Work - reinforce weight-bearing walls that support observatory roll-back roof. Divert water from exterior walls. Steve is coordinating this project.

1) 1K payment made to Alexander to purchase supplies at Lowe's

2) Second payment made for supplies at Lowe's, \$3062.84

3) Work to begin upon delivery of materials on March 29, 2024

Pad #69 issue resolved; SDAA equipment rental form pending.

Dave Decker made initial contact for June 1st, 2024 spring cleanup EDCO dumpster rental. Committee members will follow up to make final arrangements for delivery/pickup on May 16th or 17th (two weeks out). Cost for 25- or 40-yard roll-off dumpster for five days is \$898.

b. Observatory:

Observatory is in excellent condition. Nothing else to report.

c. Loaner Scope Report:

Two loaner scopes are currently out, both due back in June. Five loaner scopes are out of the fleet for maintenance (or have not yet been added to the fleet):



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- SDAA-026 (8" Zhumell Dob) was returned severely out of collimation and missing the Telrad. A replacement Telrad will be purchased and billed to the lessee. After replacing the Telrad, recollimating, and inspecting the scope, this one will return to the fleet.
- SDAA-027 (C6-N + CG-5) mirror needs to be cleaned and the mount is still with the previous lessee. The mount will be returned shortly.
- SDAA-032 (8" astrograph + LX-75) this scope has been assembled from donated parts but is still missing a few pieces. Once those are sorted this one will enter the fleet.
- SDAA-035 (16" Meade Dob) needs some work on the altitude bearings to add a clutch, to make the scope usable.
- SDAA-036 (8" Meade SCT + iOptron MiniTower Pro) has been fully tested and is ready to enter the loaner fleet. Just need to get the documentation and photos together.

A new loaner scope (SDAA-037) has been added to the loaner fleet - another Coronado PST that was found in the storage box.

The donated 8" Dobsonian mentioned in last month's report has been placed in the storage container. It still needs to be inspected and tested before entering the fleet.

The loaner scopes webpage (<https://sdaa.org/available-loaner-scopes/>) has been updated, and now includes a reference to the loaner scope tracking spreadsheet, so that as scopes are checked in and out, the webpage will update instantly and automatically. This has been set up carefully using a second "public" Google Sheet that includes only *references* to a *range of cells* in the original Google Sheet, thus ensuring that information about past and current lessees is impossible to be leaked via this mechanism.

d. Private Pad Report:

We are proceeding with notifications for non-usage, approved by the Board on March 30. The Private Pad Policy Review Committee consisting of Hakozaiki/Schutze/Myers/Smith/Pagarigan reported the following:

Tasks for March/April 2024:

Identify members for specialized tasks (evaluating observatories and telescope equipment on private pads – Completed (Hiro, key coordinator)

Tentative Tasks for May 2024:

Structure/Equipment Evaluation Reports for Pads 52, 60 and 70

Committee to meet/discuss Hiro's findings (Hiro's report summary below)

New Private Pad Policy Outline – Start Rough Draft

Pad 70:

Hiro can provide detailed documents on System Design and Operations, however this will require more meetings with John, who is willing to help. It is very well designed, easy to understand, and highly organized. A person with the correct knowledge should be able to handle



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this observatory without any issue. Maintenance tasks should be straightforward due to its good design.

Telescope: A Paramount MX+ mount and counterweight are installed, along with a shipping box for the mount, which John mentioned he bought for a couple of hundred dollars.

Electrical Design: The electrical design is very well organized and easy to understand. The modular design also makes maintenance easy. However, there could be some room for improvement, particularly concerning the battery, as it requires a grid to charge when drained. All three Lithium Iron Phosphate Batteries are connected in parallel to produce a 12V output. Three inverters serve different purposes—one for power box items, one for a roof motor, and one for the rest of the observatory items.

Network/Computer: The observatory utilizes StarLink for internet access and Firewalla for OpenVPN, ensuring a secure connection without the need to track IP addresses. All network devices connect to Firewalla and receive local IP addresses. There are two computers—one for controlling imaging equipment such as the mount, camera, and telescope accessories, and another for managing other items like the All Sky Cam and Seeing monitor.

Observatory/Power Box Structure: Both the observatory and power box appear to be well-built with no apparent issues. The observatory has an extra roller for the roof, which shows some rust and may require replacement in a couple of years. Additionally, rust is noticed on the Seeing monitor mount. The observatory floor features an extra wood layer atop a concrete pad, allowing cables to be concealed under the wood floor, facilitating a clean setup between the telescope and computer.

Pad 60:

The building structure appears solid and in good condition. The roof rolls open and close smoothly, although some brush growth impedes it from fully opening. Minor maintenance work and cleaning are needed inside, as it was somewhat messy. There are a few dead mice and one live one inside, indicating a need to identify and fix the entry points. Hiro suggests having Gene evaluate it, as the building uses similar materials and paint to Gene's telescope case at his pad.

Pad 52:

Not accessible because of two locks on door. Need to find key or cut locks and replace.

e. **Program Meetings Report:**

April program meeting topic to be "Show and Tell Adventures" from Totality SDAA member trips. As of 4/14/24 evening seven members have sent media for slide show presentation. Board members encouraged to share.

May program speaker will be Curt Kinghorn who will discuss the proposed RASIG (Radio Astronomy Special Interest Group).



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Speakers for Science in Space at the ISS National Laboratory confirmation in progress. Possibly large enough topic to span two consecutive programs.

f. AISIG Report:

The Second AISIG meeting of 2024 featured SDAA AISIG members describing their favorite images and the processing that went into the image Zoom meeting attendance was light but the meeting video has been posted to the SDAA YouTube channel. Several message from AISG members have been received indicating they'd like to participate in a similar meeting. The next meeting will feature Russ Croman of RC Afirestro discussing his advances in A.I. generated process' for Pixinsight. No topic has been announced for the May AISIG meeting

g. Newsletter Report:

All looks great – Thanks, Andrea!

h. Website Report:

The new website for Julian Starfest is up and running and the SDAA store on Wild Apricot has been updated with the 2024 JSF information.

i. Social Media:

No report

j. Outreach Report:

Once again, March turned out to be a repeat of February with various cancellations because of clouds, rain, and snow. There were 7 cancelled events because of cloudy skies. Morning Creek and Albert Einstein Schools did not give up, even after setting clocks ahead one hour on March 10th. These two schools simply rescheduled on Friday nights so that the parents wouldn't have to worry about getting up for school the next day (Saturday). One school gave up completely after two cancellations, and will contact us in the fall. Stars-in-the-Park and K.Q. Ranch are competing who can be cancelled out the most each month of the year. The weather just isn't cooperating at all with these two venues. Ranger Kyle's Oakoasis County Park seems to be far enough inland and with a little elevation to escape the coastal marine layer, still a popular stargazing venue. There were two rare daytime events that were very successful: Greater San Diego Science & Engineering Fair (judging) on March 13th and Casa de Oro Public Library (solar observing) on March 21st.



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Here are the numbers for March:

2024	Previous Total	March	YTD
Completed	11	4	15
Canceled	9	7	16
Total Attendance	985	425	1410

k. TARO Report:

TARO's operation has been limited by the weather.

TARO Project report -

Current Active projects submitted by SDAA members - 10

Total programmed image time - Approximately 200 hours

Project completions last month - 1

We are still working on acquiring two specialized JC filters that can be installed in the camera filter wheel. These filters will allow TARO to participate in monitoring the upcoming nova outburst of T Coronae Borealis. Once these filters are installed, TARO will be able to participate in additional spectroscopic studies.

l. Cruzen Report:

Cruzen was reserved zero times in March. The observatory is in working order with no outstanding maintenance issues.

The next Cruzen training session will take place April 27 or May 4 (backup). E-mail was sent via Wild Apricot to eligible members on March 23. So far there are 17 members interested in attending the training session, two of which are already certified but wishing to refresh their knowledge.

m. Merchandise Report:

SDAA store on Wild Apricot has been updated and the new SDAA stickers have been added. One license plate and several stickers were sold.



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- n. Astronomical League Report:
Mark Smith has agreed to accept the position of Astronomical League Coordinator. Dave Decker is working with him to finish the annual membership report and payment to AL and to update all of the SDAA contacts for the AL database.

- o. JSF Report:
Held the first JSF committee meeting last month. Committee members each took up an assignment such as rental of tent, golf cart, restrooms, etc. Met with several food vendors in Julian to solicit interest in providing food during the event. Will follow up with each in the coming months. Response to club request for volunteers has been fair with several members offering to assist. Next committee meeting will be April 28.

- p. Primary Grid Reconstruction Report:
A two-hour site walk was accomplished with the Project manager of Baker Electric. A follow up meeting was completed further refining the objectives. Contact info for Paul Ericsson was provided to Baker on the premises that Paul might be able to provide additional engineer data. Dave is going to reach out again to Morrow Meadows

5. Old Business:

- a. Insurance Renewal (see Treasurer's Report) Chasin
- b. Chase Bank Settlement/NDA – waiting to confirm receipt of funds Chasin
- c. Spring Clean-up – set for June 1st and working on getting a dumpster Pagarigan
- d. Other Old Business – None Decker

6. New Business:

- a. RASIG (Radio Astronomy Special Interest Group) - Kinghorn
Member Curt Kinghorn made a nice presentation about creating a special interest group for those interested in Radio Astronomy. The Board supported the idea and Curt will start working on the plan and will make a presentation about RASIG at the May membership meeting.

7. Adjournment: The meeting was adjourned at 8:06pm.

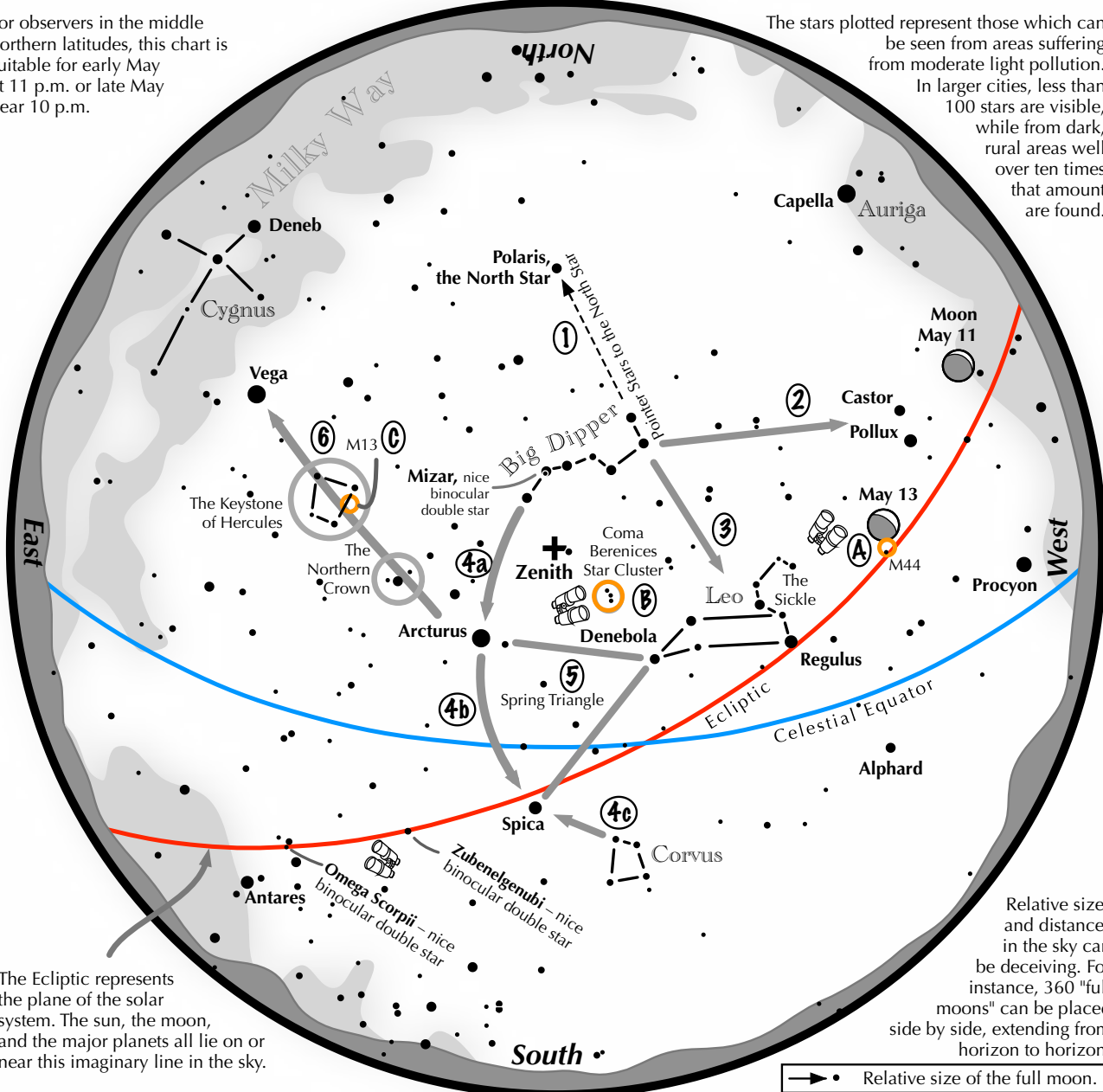


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Navigating the May Night Sky

For observers in the middle northern latitudes, this chart is suitable for early May at 11 p.m. or late May near 10 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 May night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line northward from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 3 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 4 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.
- 5 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 6 Draw a line from Arcturus to Vega. One-third of the way sits "The Northern Crown." Two-thirds of the way hides the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **B:** Look near the zenith for the loose star cluster of Coma Berenices. **C:** M13, a round glow from a cluster of over 500,000 stars.



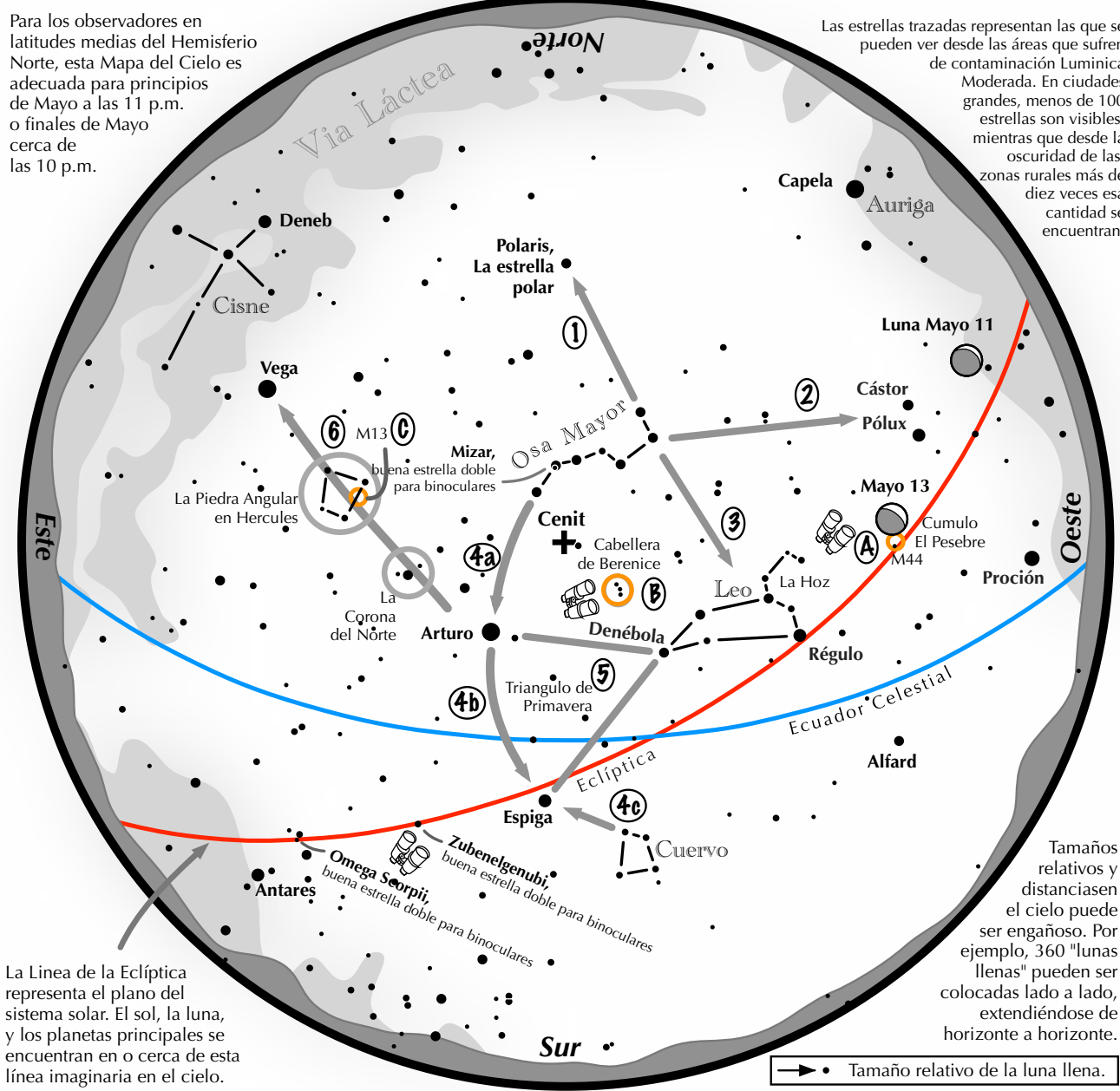


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Navegando por el cielo nocturno de Mayo

Para los observadores en latitudes medias del Hemisferio Norte, esta Mapa del Cielo es adecuada para principios de Mayo a las 11 p.m. o finales de Mayo cerca de las 10 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 Haz una línea hacia el norte desde las dos estrellas en la punta de la Osa Mayor. Pasa por Polaris, la estrella polar.
- 2 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. Directamente debajo del tazón de la Osa Mayor se encuentra Leo con su estrella principal, Régulo.
- 3 Siga el arco del mango del tazón de la Osa Mayor. Primero cruza Arturo, luego continúa hacia Espiga, luego Cuervo.
- 4 Arturo, Espiga y Denébola forman el triángulo de primavera, un gran triángulo equilátero.
- 5 Dibuja una línea desde Arturo a Vega. Un tercio del camino se encuentra "La Corona del Norte". Dos tercios de esa distancia llevan a la "piedra angular de Hércules." Se necesita un cielo oscuro para ver estas dos configuraciones estelares tenues.
- 6

Puntos destacados con binoculares

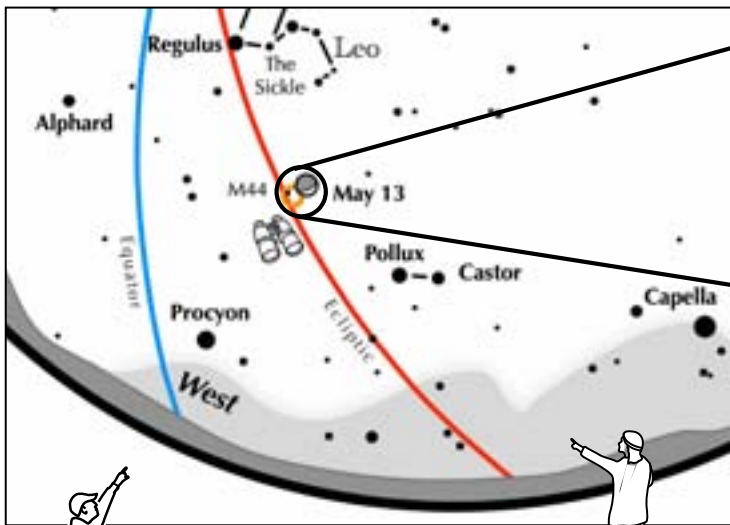
- A: M44 (Cumulo El Pesebre), un cúmulo de estrellas apenas perceptible a simple vista, se encuentra al sureste de Pólux.
- B: Mira alto en el este para ver el cúmulo de estrellas perdidas de Cabellera de Berenice.
- C: M13, un brillo redondo de un cumulo de más de 500,000 estrellas.



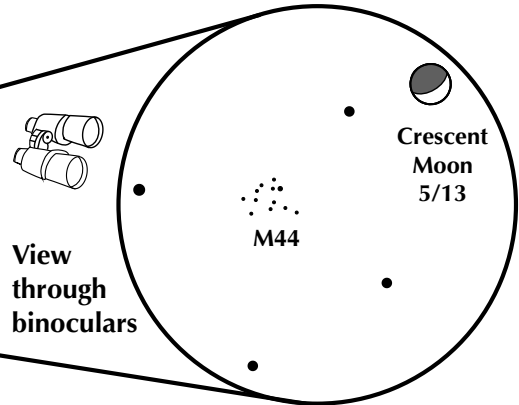


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In the early evening on May 13, try this challenge:



View to the west
on May 13
90 minutes after sunset



Crescent moon meets the Beehive

On the evening of May 13, the crescent moon floats right of M44, the Beehive star cluster. Look in the west 90 minutes after sunset.

Be sure to use binoculars to spot the many stellar bees of M44. The cluster has over 1000 stars, but only two dozen will be picked out with binoculars.



Even though they lie near each other in binoculars, they are nowhere near each other in three-dimensional space. M44 is 150 million times farther than the moon!

It has taken the light from M44's stars over 600 years to reach your eyes!



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Binoculars and Double Stars

A rewarding and challenging activity

<https://www.astronleague.org/binocular-double-star-observing-program/>



Effective Binocular Observing ...

- Binoculars must be precisely focused.
- Binoculars must be held steady. Mounted on a tripod is best.
- Adequate dark adaption is needed. Wait at least 15 minutes in the dark before meaningful observing begins. 30 minutes is better.
- Glare from a bright primary interferes with spotting a dim secondary. The greater the magnitude difference, the greater the difficulty splitting them.
- Steady atmospheric seeing is desired.
- Best observed when the double star has an altitude higher than 30°.

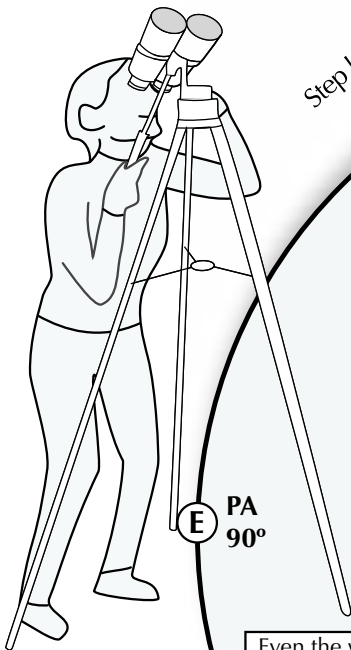
In Your Observing Notes:

- ✧✧ Brightnesses of the components.
- ✧✧ Separation of the components.
- ✧✧ Position Angle (PA).
- ✧✧ Colors of the components.
- ✧✧ Neighboring stars in the field?
- ✧✧ Seeing conditions.
- ✧✧ Atmospheric transparency.
- ✧✧ Altitude.

Rule of Thumb ...

Minimum true separation with 10 x 50 binoculars:

- ✧ 24 arc seconds for two stars of 4th magnitude. This equals 4 minutes apparent separation.
- ✧ For comparison, the full moon has a true diameter of 1800 arc seconds (=30 minutes).
- ✧ **True separation** is the angular space between stars as it appears to the unaided eye. **Apparent separation** is how it appears in binoculars.



Step back 1.5 m (4.75 ft) from this 150 mm (6 inch) printed field, and the 6° field will match 6° in the sky.

6° true angular field – typical for binoculars

Example Doubles

Stellar Magnitude

- 2 ●
- 3 ●
- 4 ●
- 5 ●
- 6 ●
- 7 ●
- 8 ●

- Alpha Capricorni
381", PA: 290°
- Delta Cephei
41", PA: 191°
- Σ1474 Hydrae
66", PA: 27°
- 56 Andromedae
203", PA: 298°
- Nu Draconis
61", 311°
- Alpha Ursae Majoris
385", 206°



Relative diameter of the full moon.

Separation distance

- 600" = 10'
- 300" = 5'
- 120" = 2'
- 60" = 1'
- 40" = 0.67'

Even the wider doubles appear close to each other. Two stars that have a tight separation, or a large magnitude difference, or a combination of the two are much more difficult to split, sometimes frustratingly so, but an enjoyable challenge nonetheless.



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The poster features a purple background with a central oval containing various astronomical symbols like galaxies, planets, and a horse. The text 'ALCON 2024' is written in large, bold, yellow-green letters. Below it, 'STARS AND ALL THAT JAZZ!' is written in a similar font. The dates 'JULY 17-20, 2024' are in white. Two circular logos are in the bottom right corner.

To register for ALCon, first click on the link, then choose "buy tickets."
<https://www.tickettailor.com/events/astronomicalsocietyofkansascity/1187693#>

It's ASKC's 100th anniversary! We are honored to be the official host for this year's Astronomical League Convention – ALCon 2024 – this July.

Held at the beautiful Overland Park DoubleTree Hotel

See you at ALCon!

Astronomical Society of Kansas City

<https://www.tickettailor.com/events/astronomicalsocietyofkansascity/1187693>



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Meanwhile Back in San Diego for The Partial Solar Eclipse...

By Dennis Ammann, SDAA Outreach Director

While everyone was viewing the total solar eclipse back east along the moon's 60-mile shadow, a few of us were left behind in San Diego to share the partial solar eclipse on Monday, April 8, 2024, with the public. Five of us were at the eastern side of the main fountain at Balboa Park, while SDAA Directors, Kin Searcy and Gracie Schutze, plus SDAA members A.C. Wood, and Dorothy Wood were out at Mission Trails Regional Park HQs sharing the sky with sixty people there.

Our 'sun-moon show' here in San Diego peaked at 11:11 a.m. with about 58% coverage by the moon under mostly clear skies, turning the sun into a banana shape. Unfortunately, right at 11:11 a.m., a large cloud blocked out the partial eclipse for a few minutes, but it wasn't thick enough to totally block out the sun.

Partial solar eclipse day, here in San Diego started out with very few clouds, then developing a few large ones floating by, causing the sun to occasionally go in and out of view. Most of us started setting up at 8:00 a.m. when the crowds also started to arrive. I estimated about 1,500 people were present, more than last year's partial solar eclipse on October 14, 2023, I estimated about 1,000.

There were five of us next to the eastern side of the Balboa Park fountain, in support of the Fleet Science Center's presence there educating the public about this astronomical event. The Fleet was nice enough to provide a long table and two chairs for us to use, plus a sign that displayed, "*Ask the Astronomer.*"

The SDAA contingent included: Doug Hansen who brought his Coronado 70mm H-Alpha refractor, Ralph Petrozello, Coronado 40mm H-Alpha refractor, Jennifer Koles, Celestron 8" SCT, and I brought my Orion 10" Dobsonian and Orion 90mm refractor. Annette Brown, my sister was working the 10" Dob and I my 90mm. Ralph brought his famous three ring binder of star size comparisons and Ritz Crackers (solar projector) with white index cards (projector screen) for people to focus the seven small holes onto the card and see the partial eclipse focused seven times on the card. Ralph and Dennis also brought colanders to show the people the partial eclipse even better, focused on the sidewalk.

During the max eclipse, I abandoned my 90mm, ran over to the northern edge of the fountain where the trees were and caught a glimpse of the trees projecting the eclipse on the sidewalk. They were 'dancing' a little bit because of a slight breeze. I then ran back to my scope as the person viewing told me the sun disappeared from view... so I quickly brought it back to the center field of view. I never did figure out how to stop the Earth's rotation, so I don't have to keep the sun-moon center in the eyepiece...

As quickly as it started, it ended just as quick and soon we were only seeing a small piece of the sun being taken out by the moon. Everyone was so nice, waiting in line, thanking us for showing them the partial eclipse, and pointing out the tiny sunspot that is as large as three Earths!

I can't wait to see the next partial solar eclipse on August 12, 2045!

Keep looking up!



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Two future Astrophysicists and their father



Annette Brown (Lt) & Jennifer Koles (Rt)



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Dennis Ammann (Lt) & Annette Brown (Rt)



Dennis' friend Ady Hom using colander as projector



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Getting that picture of the partial eclipse



Jennifer Koles with her 8 inch SCT



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Looking NW towards the Natural History Museum



Looking SW towards Fleet Science Ctr



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Looking west across the fountain



Partial Solar Eclipse 58% Coverage



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Ralph Petrozello (Lt) & Doug Hansen (Rt) with hats



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Another Look
May 2024 Draco

May 3, waning crescent, moon occults Saturn. 1.5 deg apart, in So Ca and Arizona it is a pre-sunrise event
May 4 waning crescent moon occults Mars, in So Ca and Arizona they are very close at sunrise
On May 31 the moon occults Saturn and Neptune. Both have a very close approach in the AM. The Saturn occultation will be visible from Tierra del Fuego and Neptune's from Cape Town.

The New moon in May is on the 7th at 2023 PDT The Full moon in May is on the 23rd at 0653 PDT
In Spanish the New Moon is Mayo Luna Ilena, in German Vollmond im Mai, in Latin Maii Plenam Lunam,
in Italian Luna Piena di Maggio, in French Pleine Lune de Mai, in Ukrainian Травневий Новий Місяць- Травневу Повну Мисяць' and in Greek Πανσέληνος Μαΐου, Spansélinos Maïou

Lots of early morning stuff to see. On May 9, Mercury is at greatest western elongation, on the 13th, Mercury is at its highest in the morning sky, and on the 14th Mercury is at dichotomy. (half moon shape). On May 18 Jupiter is at solar conjunction

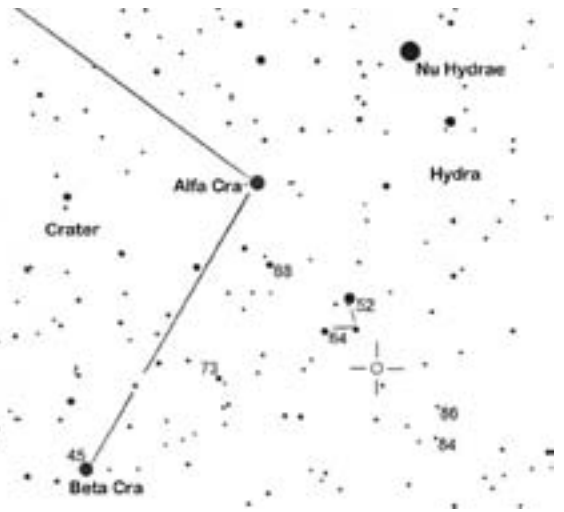
Latin Dragon, Spanish Dragòn,
French Dragon, German Drache,
Greek δράκων drakōn, Italian Drago
Meteors this month are the Eta Aquarids. They range from April 15 thru to May 27, peaking at May 05, around 0400.
The moon will be 26 days old, so should not be too great a hindrance.



Variable star this month is V Hydrae
<https://www.aavso.org/featured-variables>

"You are all poets." I told a gathering of amateur astronomers at the 1983 annual Texas Star Party. At first they reacted with silence. Then they began to agree. The common thread that binds amateurs together is a love of the grandeur and beauty of the starry deeps. While some may claim it's the science of astronomy that interest them. I believe that deep down it is the ultimate experience of the night sky that hold the real attraction.

"Deep Sky Wonders" Walter Scott Houston published in "Sky and Telescope" magazine.
<https://www.meredithdillman.com/art-shop/draco-constellation-art-print>



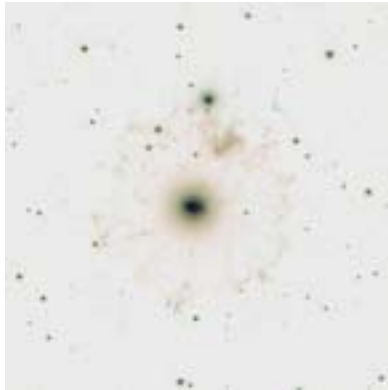
When Scotty wrote this, it was a preamble to a column on NGC 6543, the "Cat's Eye Nebula".
Scotty went on to talk about its appearance in everything from a 1" homemade refractor to a 4" Clark to a 20" Dob and even to the 60" at Mt. Wilson. He wanted you to look at the Cat's Eye and really see it. What is its color? Is it blue or do you see green? How big is it? What power are you using to get the best view? Can you see it's central star? Is it 9th or is at 11th magnitude? How about the shell? Scotty never heard from an amateur reporting on seeing it. Back then in the early days the shell wasn't thought of as possible. It wasn't until 2002 that APOD published an "Isaac Newton" image of the shell. What can we see with our modern optics and (hopefully) refined skills.? John Garrett uses a variety of amateur telescopes to record what the Cat's Eye will look like to you. The reverse image below shows what Eric Seavey captured in 2018.



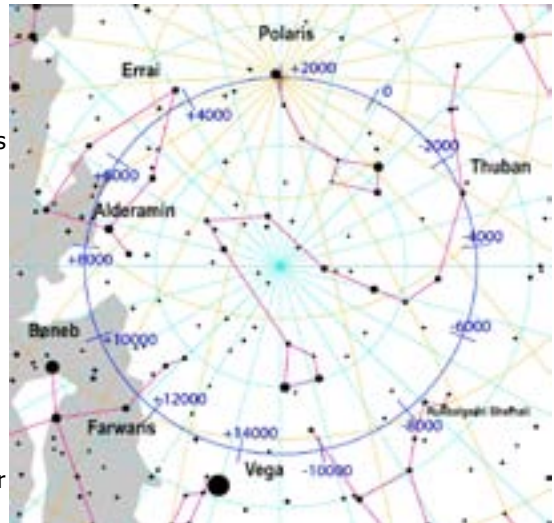
<http://www.jgscience.org/astronomy/messiers.html>
<https://ocastronomers.org/wp-content/uploads/2018/12/Cats-Eye-Nebula.jpg> Eric Seavey 2018



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The north ecliptic pole lies in Draco, and the south ecliptic pole in Dorado. It is usually explained that the earth wobbles on its axis like a kids top spinning in circles. The wobble the earth makes is a 25,800 year cycle and the cone is about $23\frac{1}{2}^\circ$ from the vertical. Deneb will be the pole star in about 8,000 years, Vega in about 12,000 years and Thuban will be back to being the north star



in 21,500 years. Can't wait.

The funnest story about Thuban is its relationship to the pyramid builders. Thuban was the pole star 4500 years ago and while it is clear that the ancient Egyptians of the 4th dynasty used astronomy to mathematically align the great pyramid, the science dates and the archaeological dates do not coincide to give Thuban any special role.

Draco contains eighty stars, including two of the 2^d magnitude, three of the 3^d, and sixteen of the 4th--

" The Dragon next, winds like a mighty stream:
Within its ample folds are eighty stars,
Four of the second order.
Far he waves His ample spires, involving either Bear."

Draco has 14 named stars that go back to very early in its defined life. γ Draconis is Eltanin, the brightest star in Draco at 2nd mag. The name come from the Arabic meaning the great serpent.

β Draconis's name is Rastaban meaning the head of the serpent. δ Draconis is named Altais meaning the goat.

ζ Draconis's name is Aldhibah coming from the Arabic for Hyenas.

Edasich is the name for ι Draconis. Edasich is famous. She is the first giant star found with a planet. Also she has a debris disk. The exoplanet's name is Hypatia. Edasich is derived from the Arabic for male Hyena, Hypatia who was named much later, from the Greek meaning highest or supreme.

χ Draconis and ϕ Draconis are named Batentaban Borealis and Batentaban Australis. Being right there at the first loop after the head of Draco, their name means the belly of the serpent.

α Draconis is more famous for its position than for its brightness. Its name is Thuban which means the snake and is between 3rd and 4th magnitude. His claim to fame came 6000 years ago when for 4300 years he was the pole star. There is some question about its variability. Different magnitudes have been given it over the centuries. Admiral Smyth in 1844 measured it at 3.25. Today it is measured half a magnitude fainter at 3.7.

ξ Draconis's name is Grumium, not Greek and not Arabic, but Latin, given its name by Ptolomy. Xi is down by Draco's jaw. Grumium comes from the Latin for snout.

Shǎowèi, κ Draconis, almost 4th magnitude, has an interesting history. On the chart you will see a partial oval from Thuban up past λ and on into Ursa Major and Camelopardolis. This is the "right wall" or historically, "the Second Star of Right Wall of Purple Forbidden Enclosure", representing the "Second Chief Judge". Kappa K also has an interesting history as an ignored pole star. Kappa was closest to the pole after Thuban vacated the spot for almost 1800 years but was never acknowledged because Kochab, β Ursae Minors, was also nearish and 2nd magnitude.





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Alsafi is the name for σ Draconis. It is historically a part of a three star asterism containing sigma, epsilon and tau. Alsafi is the official name of σ sigma. The name comes for the tripod that held the nomad's cook pot. Interestingly, it is also part of a kitchen in Chinese astronomy, marked on the charts and consisting of rho, pi, delta, epsilon and **64** Draconis.

Nu Draconis along with gamma, Mu and Xi make up the head of the dragon and the "Mother Camels" in Arabic. Kuma, the proper name for Nu, seems to have no etymology. If you ask Google, it will tell you it translates to the Japanese for bear.



You will find 42 Draconis up by the NEP in the curve of the neck. 42 is named Fafnir and its planet named Orbiter. Orbiter is a made up name referring the NASA space launches. Fafnir is a Norse dwarf that was turned into a dragon. The names were nominated to the exoplanets competition by Brevard County, FL.

I read and reread all of Frank Herbert's Dune books. Admiring the Freman and despising the Harkonnens. μ Draconis is Arrakis, now spelled Alrakis. Mu is a multiple star system. Alrakis B is a double and Alrakis C is at 14th magnitude. In the novels, Arrakis is a planet in the Canopus star system.

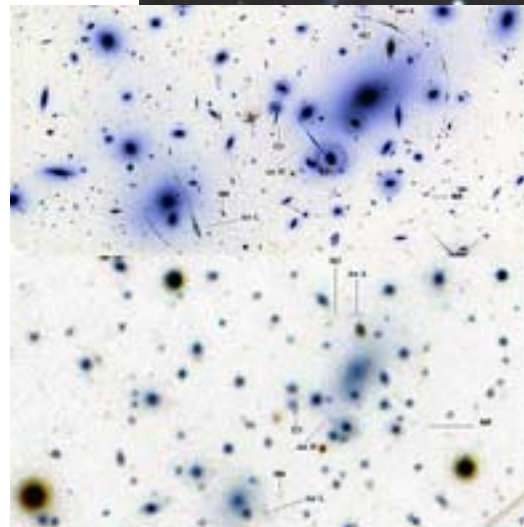
Draco is big, over 1000 square degrees, in the top ten of constellation's size. It has over 300 extrasolar planets, 19 galaxies of 12th magnitude and brighter and the number goes up to 29 when we go into the 13th.

There are two spectacular planetary nebula and two Caldwell objects, C-3, NGC 4236, up by κ kappa, is a loosely mottled galaxy that can be seen at 10th magnitude. C6 is NGC 6543, the Cats Eye Nebula. Burnham lists 116 double and multiple star systems and 49 variables.

There are a number of deep sky objects in Draco that would stretch the imagination and equipment of just about any amateur. Abell 2218 is huge. Nearly 10,000 galaxies and one of the strongest gravitational lenses known. Then there is the Tadpole galaxy, official name Arp 188, or the even more compelling name of UGC 10214.

<https://www.astrobin.com/full/288378/B/>

At 14th magnitude the Tadpole will not be easy to see. But it is possible to see the tidal tail and maybe even its disrupter galaxy hidden between its spiral arms with enough aperture.





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The professional images by Hubble of Abell 2218 are something to marvel at, but visually it will be hard to find. A diligent search found that the brightest galaxy in the frame is UGC413.

14" LX200R @ f/10, L=6x20' RGB=2x20', STL-11000XM, Paramount ME (Image by Rick Johnson, now deceased)

<https://images.mantrapskies.com/catalog/OTHER/ABELL2218/>

I included the specs on this image, finding it hard to believe that an amateur could do such work. If you connect to the link and blow up the image, the arcs show up quite well.



M102, 9th mag, also known as NGC 5866 has been an enigma since added to Messier's list. It was discovered in the late 1700's by Messier or maybe Méchain and almost certainly a decade later by Herschel. Since we amateurs today seem to believe the giants on whose shoulders we stand could do no wrong, the controversy over which galaxy they were talking about continued until recently when the IAU decided that M102 and 5866 were the same animal. Photographs tend to blow out the galaxy somewhat. A decent night and some power should resolve the dark lane in the middle of the spindle with even a six inch Newtonian. <https://oc astronomers.org/wp-content/uploads/2018/12/NGC-5866-36m-6F8r1-copy.jpg>

N4125 and N4236 are up by the tail of Draco and noticeable because they are both in the 10th magnitude. 4125 is a slightly flattened elliptical that Burham tells us has a bright nucleus that should

be easy for you to pick out. 4236 is different. It is a mottled spiral with faint surface brightness but as big as the 3/4 moon on its large dimension. Try to find the knots of star formation on the spiral arms.

https://www.coldphotons.com/zen_astro/astro_images/NGC4236_LRGB_web.jpg

<https://www.astrobin.com/full/252823/0/>

This rather remarkable image, of 4125 taken by Kathy Walter in 2016, also shows the supernova.



<https://www.astrobin.com/full/169092/0/>

N 5981, 82, 85 [Jussi Koponen](#)

<https://cosmic-colors.com/galaxies/draco-dwarf/> **Jarrett Trezzo**

You may be able to see 5982 visually. Its 11th magnitude with a somewhat brighter nucleus, but small.

5985 is 12th, the big spiral next to it and 5981 is the other edge-on galaxy, listed at 14[>] mag. The small group is known as the Draco Triple.

As we continue our discussion on Dwarf galaxies, Draco offers us an object that should be one of our easier. The Draco dwarf is 10th magnitude and, as you can see, has a number of stars usable as finders. The galaxy is listed as a spheroidal dwarf galaxy but is slightly more oval than round. Still, it is slightly larger than the full moon so I expect it to nearly fill the field of view of a 25mm to 32mm eyepiece.





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Draco is old. Writers concentrate on the Greek legends, with a few references to Phoenician, Chaldean and Roman authors. But, Draco goes back much further than that. 30,000 years ago Thuban was the pole star. That is near the peak of our last ice age and people were migrating from Africa to the east and to the west and Neanderthals were living in the frozen north. Draco was right there for the cave artists, hunters and spiritual leaders.

The stars of Draco have certainly moved, and our rock art could also be serpents and imaginative steeds.

What we do know is that our ancestors in the last ice age ascribed importance to that sinuous line of stars circling the north. And, as Scotty said; Since Then, Till Now, We are All Poets.
Dark Skys Dave





San Diego Astronomy Association

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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.



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NASA Night Sky Notes

May 2024



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 to find local clubs, events, and more!

May’s Night Sky Notes: Stargazing for Beginners

By Kat Troche

Millions were able to experience the solar eclipse on April 8, 2024, inspiring folks to become amateur astronomers – hooray! Now that you’ve been ‘bitten by the bug’, and you’ve decided to [join your local astronomy club](#), here are some stargazing tips!

The Bortle Scale

Before you can stargaze, you’ll want to find a site with dark skies. It’s helpful learn what your [Bortle scale](#) is. But *what is* the Bortle scale? The Bortle scale is a numeric scale from 1-9, with 1 being darkest and 9 being extremely light polluted; that rates your night sky’s darkness. For example, New York City would be a Bortle 9, whereas Cherry Springs State Park in Pennsylvania is a Bortle 2.



The Bortle scale helps amateur astronomers and stargazers to know how much light pollution is in the sky where they observe. Credit: International Dark Sky Association



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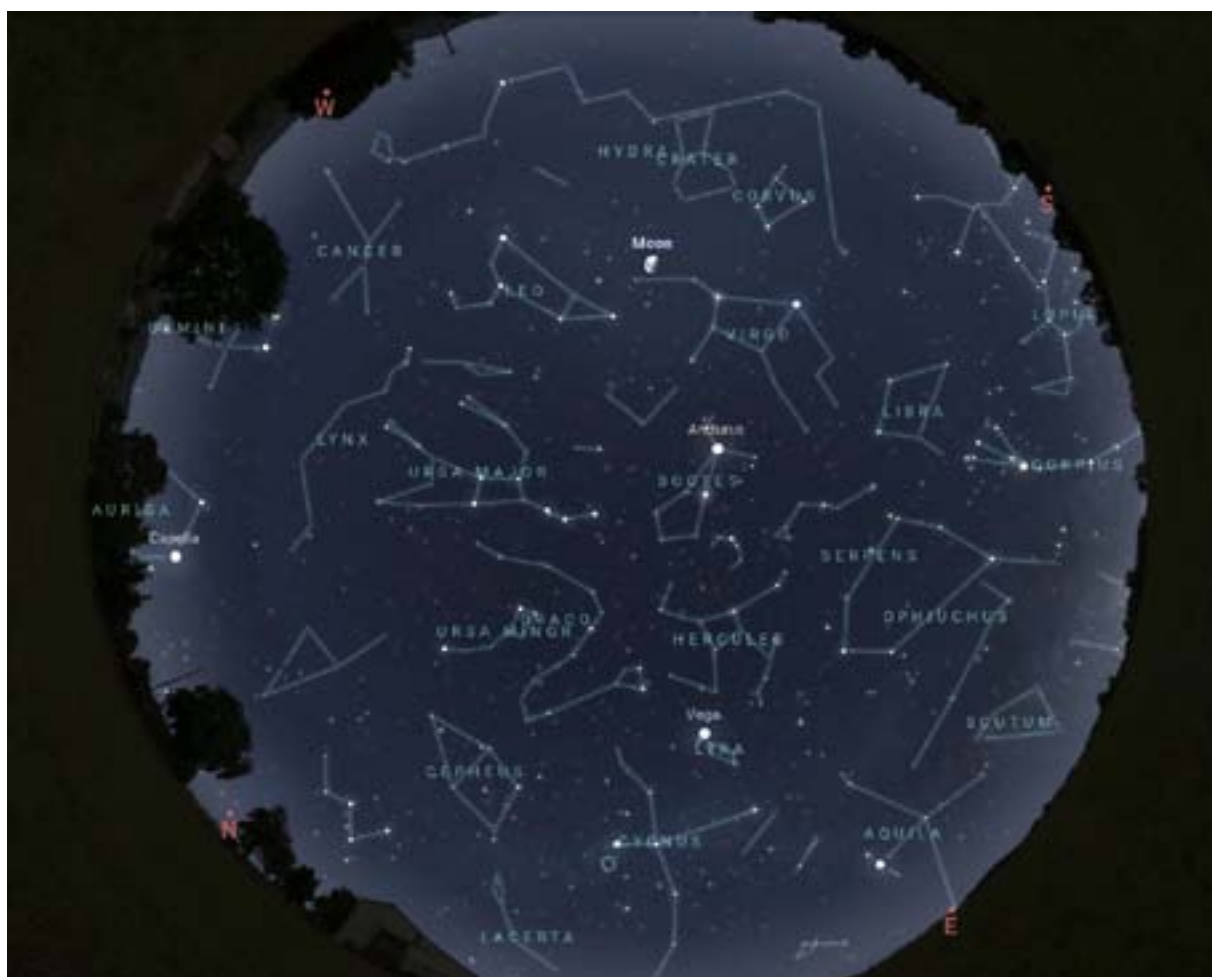
NASA Night Sky Notes

May 2024

Determining the Bortle scale of your night sky will help narrow down what you can expect to see after sunset. Of course, other factors such as weather (clouds namely) will impact seeing conditions, so plan ahead. Find Bortle ratings near you here: www.lightpollutionmap.info

No Equipment? No Problem!

There's plenty to see with your eyes alone. Get familiar with the night sky by studying star maps in books, or with a planisphere. These are great to begin identifying the overall shapes of constellations, and what is visible during various months.



A full view of the northern hemisphere night sky in mid-May. Credit: Stellarium Web.

Interactive sky maps, such as Stellarium Web, work well with mobile and desktop browsers, and are also great for learning the constellations in your hemisphere. There are also several astronomy apps on the market today that work with the GPS of your smartphone to give an accurate map of the night sky.



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NASA Night Sky Notes

May 2024

[Keep track of Moon phases](#). Both the interactive sky maps and apps will also let you know when planets and our Moon are out! This is especially important because if you are trying to look for bright deep sky objects, like the Andromeda Galaxy or the Perseus Double Cluster, you want to *avoid* the Moon as much as possible. Moonlight in a dark sky area will be as bright as a streetlight, so plan accordingly! And if the Moon is out, check out this Skywatcher's Guide to the Moon: bit.ly/MoonHandout

Put On That Red Light

If you're looking at your phone, you won't be able to see as much. Our eyes take approximately 30 minutes to get dark sky adapted, and a bright light can ruin our night vision temporarily. The easiest way to stay dark sky adapted is to avoid any bright lights from car headlights or your smartphone. To avoid this, simply use red lights, such as a red flashlight or headlamp. **The reason:** white light constricts the pupils of your eyes, making it hard to see in the dark, whereas red light allows your pupils to stay dilated for longer. Most smartphones come with adaptability shortcuts that allow you to make your screen red, but if you don't have that feature, use red cellophane on your screen and flashlight.

Up next: why binoculars can sometimes be the best starter telescope, with [Night Sky Network's](#) upcoming mid-month article through NASA's website!



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2024 TDS Star Party Schedule

Date	Type	Sunset	Astro. Twi.	Moonrise(set)	Closing	Illumination
Jan-06-24	Public	4:57 PM	6:24 PM	3:07 AM	9:30 PM	26.5%
Jan-13-24	Member	5:03 PM	6:30 PM	(7:50 PM)	9:30 PM	8.5%
Feb-03-24	Public	5:22 PM	6:47 PM	1:55 AM	9:30 PM	44.0%
Feb-10-24	Member	5:29 PM	6:52 PM	(6:39 PM)	9:30 PM	1.4%
Mar-02-24	Public	5:47 PM	7:09 PM	12:46 AM	10:00 PM	61.4%
Mar-09-24	Member	5:52 PM	7:14 PM	5:52 AM	10:00 PM	0.6%
Apr-06-24	Member	7:12 PM	8:37 PM	5:20 AM	11:00 PM	6.0%
Apr-27-24	Public	7:27 PM	8:57 PM	11:36 PM	11:00 PM	88.3%
May-04-24	Member	7:33 PM	9:04 PM	4:20 AM	11:30 PM	16.0%
May-11-24	Public	7:38 PM	9:12 PM	(11:53 PM)	11:30 PM	17.7%
Jun-01-24	Public	7:51 PM	9:31 PM	2:50 AM	11:30 PM	28.5%
Jun-08-24	Member	7:55 PM	9:36 PM	(10:31 PM)	11:30 PM	6.8%
Jul-06-24	Member	7:59 PM	9:40 PM	(9:07 PM)	11:30 PM	1.1%
Jul-27-24	Public	7:50 PM	9:24 PM	11:58 PM	11:30 PM	56.6%
Aug-03-24	Member	7:44 PM	9:17 PM	(7:44 PM)	11:30 PM	0.6%
Aug-31-24	Public	7:13 PM	8:38 PM	4:59 AM	11:00 PM	5.2%
Sep-07-24	Public	7:04 PM	8:28 PM	(9:20 PM)	11:00 PM	20.0%
Sep-28-24	Member	6:36 PM	7:58 PM	3:52 AM	10:30 PM	14.5%
Oct-05-24	Member	6:27 PM	7:48 PM	(7:54 PM)	10:30 PM	8.6%
Oct-26-24	Public	6:02 PM	7:25 PM	2:42 AM	10:30 PM	28.1%
Nov-02-24	Public	5:56 PM	7:19 PM	(6:30 PM)	10:00 PM	1.7%
Nov-30-24	Member	4:42 PM	6:09 PM	7:11 AM	9:30 PM	0.4%
Dec-21-24	Public	4:47 PM	6:15 PM	11:15 PM	9:30 PM	63.2%
Dec-28-24	Member	4:51 PM	6:19 PM	6:00 AM	9:30 PM	5.2%

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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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; \$40 for Basic Membership; \$70 for Private Pads; \$5 for each Family membership.