San Diego Astronomy Association

Celebrating Over 50 Years of Astronomical Outreach

May 2025

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

Next SDAA Business Meeting
May 13th at 7:00pm

Via Zoom

Next Program Meeting
May 21st

Via Zoom

CONTENTS

May 2025, Vol LXIII, Issue 5
Published Monthly by the
San Diego Astronomy Association
Incorporated in California in 1963

May 21st Progam Meeting

May 21, 2025
6PM to ~9:30PM

Speakers: Pat and Grady Boyce
Topic: From Backyard to Mount Wilson: The Evolution of Boyce-Astro

Since 2013, Boyce-Astro has grown from a local education project into a global network having engaged over 1,000 students worldwide in real astronomical research. With observatories at TDS, SRO, Las Cumbres, and now Mount Wilson's 60" and 100", its scope has expanded to photometry, spectroscopy, and data science. Pat and Grady Boyce will share how it all began, what's next—and how SDAA members and their families can get involved.

The meeting will be held via Zoom.

See https://sdaa.org/program-meeting/

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
April 8, 2025 – Unapproved and subject to revision

1. **Call to Order**
   The meeting was held via Zoom and was called to order at 7:03pm with the following board members in attendance: Dave Decker, President; Bee Pagarigan, Vice President; Mike Chasin, Treasurer; Kin Searcy, Recording Secretary; David Wood, Corresponding Secretary; Drew Koning, Director; Jerry Hilburn, Director; Ross Salinger, Director; and five SDAA members. BOD member absent and excused was Gracie Schutze, Director.

2. **Approval of Last Meeting Minutes**
   The March meeting minutes were approved by unanimous resolution. (Motion: D Koning/Second: D. Wood)

3. **Treasurers & Membership Report**
   The Treasurer's report was approved by unanimous resolution. (Motion: D. Koning/Second: J. Hilburn). SDAA membership is presently 784. California DOJ raffle filing fee and application submitted.

   SDAA received a record high March electric bill of $626.10 for the North meter that only reads usage for observatory row and the Cruzen. The average monthly bill is $207 and the Cruzen was not used in March due to the weather. Observatory owners present (J. Hilburn, R. Salinger, and B. McFarland) did not notice unusual activity such as EV charging, **Action BOD 04-01:** David Wood will put together a usage report in KWH for the observatory owners who will recommend how to address this issue.

4. **Standard Reports.** The February standard reports are included as submitted with Board discussion and action in italics.

a) TDS Operations Report for April 2025 **Pagarigan/Myers**

* Private Pads to be inspected and identified with respective numbers on a date TBD by Private Pad Committee Members.
* Member request to install red lights for guidance at TDS main gate – work in progress
* TDS Spring Clean-up scheduled for April 26, 2025. *See Old Business.*
* Per J. Hilburn, Justin planned to begin TDS road repair the weekend of April 4, 2025. *Jerry Hilburn reported that the road work was completed from Tierra Del Luna to the SDAA gate for $3K. SDAA may have to fund this work every three years.*

b) Lipp Observatory **Rumsey**

Weather finally got to us. All three scheduled star parties this month were canceled. The University of San Diego star party has been rescheduled for Sunday, April 27th. The scope is performing well.

c) Loaner Equipment **Krizak**

30 loaner items are currently out. 3 were returned in March and 13 checked out.

The donated MiniTower Pro with 8" SCT has been reviewed, tested, and documented as SDAA-78. It is now listed on the website and is available for members to loan out.

The donated XT10i is still pending evaluation and testing. *Dave Decker agreed to help.*

I have photos of the Celestron SE wedge tripod but still need to get an ad together that we can include in an upcoming newsletter.

I also still need to try assembling the Orion dob dolly to see if it's worth keeping, selling to members, or discarding.

d) Storage Facility **Krizak**

All but one of the banquet auction items have been picked up now. It's been months now with no response from the winner on the last item (which I think sold for like $2) so I'm going to call the banquet auction item delivery process "done" and move on.

We are still pending a long-term plan for the Bill Lucas Newtonian. My suggestion stands to move it to the TDS storage box until a plan can be formalized.

There are two folding tables at the storage facility donated by a member, which I need to move out to TDS. I'm hanging onto a third donated table as it's handy to have a table to work on when working in the facility.

The storage facility remains in good condition and is seeing regular use.

e) Private Pads **Smith**

We currently have 7 unleased pads plus Pad 70. I just leased my first pad in 8 months. *Mark Smith attributed the lack of activity to the electrical shutoff on the South grid.*

f) SDAA Private Pad Policy Committee **Gracie/Mark/Bill/Bee**

For Board Action;

Proposal submitted by Mark Smith regarding restructure and unification of the Pad Policy Committee and Pad Chairperson. *This proposal is covered under New Business.*

g) SDAA Monthly Programs Report for April, 2025 **Pagarigan/Searcy/Dorothy Wood**

Work in progress:

* Program speaker schedule for remainder of year work in progress
* Speaker fee of $200 permitted on trial basis
* Tap in-house expertise speakers to reduce cost

Tasks Completed:

* May speaker scheduled – SDAA Member, Pat Boyce, will present Boyce Astro
* April meeting moved to 4/24 and will be in-person at MTRP, topic IDA, program will include a documentary film and star party. Cathy Handzel, Dave Decker, Kin Searcy are POC's.

Dave Decker explained that the SDAA/IDA/MTRP event is focused on showing of an IDA movie about dark skies in California with a SDAA star party on the terrace and dark sky-related displays. This supports IDA's mission as well as MTRP's application as a Dark Sky Place. Arrangements are being made to Zoom the event as the SDAA April program meeting since tickets for the event have all been claimed.

Recognizing SDAA's support for this event and the fact that SDAA outreach events are open to the public at no cost, the BOD unanimously adopted a motion to approve $1500 to support the 24 April event at MTRP. (Motion: D. Decker/Second: R. Salinger).

h) AISIG **Wood**

During last month's meeting, one of our members expressed interest in discussing their experience setting up a robotic telescope system at a remote telescope farm in Texas. This month, Wes Mitchell shared his involvement in establishing a robotic telescope system at the Starfront Observatory, situated near Rockwood, Texas, under Bortle 1 skies. His account sparked a good discussion both during and after the meeting. Several AISIG members expressed curiosity about the possibility of "time sharing" a pier at the observatory.
Due to the scheduling of the main SDAA membership meeting there will be no AISIG meeting in April

i) Newsletter **Kuhl**

Nothing new to report this month.

j) Website

Stevens

Nothing new to report this month.

k) SDAA Social Media Report for March 2025 **Pagarigan**

SDAA Podcast Hosts **Pagarigan/Morquecho**

Tasks WIP or Completed

* Video/Audio from SDAA Events undergoing edit
* Program schedule for 2025 work in progress
* Targeting June for pilot podcast broadcast

l) Outreach Report **Ammann**

The first week of March ended our busy school season. It would have been a lot busier, but the weather had other plans. We had to cancel eight events because of foul weather, disappointing many schools. Five events survived in foul weather of March, two are worth a mention. Ocean Beach Elementary School surprised us with a clear dark sky, right next to the ocean! About 150 students and parents were delighted viewing Venus, Jupiter, and Mars. Although only Craig Storms and Dennis Ammann were available, they were mobbed in a pleasant way. The other March success was K.Q. Ranch with Brad and Braydon Jameson taking over for Dennis' absence. They ran that event like a finely oiled Swiss watch, under a dark night sky above them for the campers to view.

Here are the numbers for February:

2025	Previous Total	March	YTD
Completed	14	5	19
Canceled	18	7	25
Total Attendance	1245	355	1600

The BOD noted that due to weather, more events were cancelled than completed is 2025.

m) TARO **Wood**

TARO is fully operational, but operations were still hampered by the weather with less than 10 hours of actual imaging time in March.

Projects completed - 0
New Project requests - 0
Total current projects in the Scheduler - 7
Total Imaging hours - 125 hours

n) Cruzen **Salinger**

Nothing much to report regarding the Cruzen. We had one user about a week ago who only stayed a couple of hours. I'm planning a new training session in April when the weather is better and more predicable in advance.

o) Merchandise Report **Burch**

Nothing new to report.

p) Astronomical League Report **Smith**

Nothing to report. I'm trying to come up with ways to entice more members into the AL.

q) JSF Report **Vacant**

See discussion and motion in Old Business.

r) Grid Reconstruction **Wood**

North Grid Reconstruction

A design review meeting was held on March 13th at Neal Electric's corporate headquarters in Carlsbad. Attendees included Jake Henselmeier, project manager, Troy Estrema, Special Projects, Ed Rumsey, and David Wood. We were also introduced to Sam Passanisi, president of Neal Electric. The meeting centered on critical aspects of the project's electrical infrastructure, particularly single-line diagrams, trenching details, and electrical site plans. The objective was to refine the initial electrical system design drawings for submission to SDG&E. Neal Electric's project tasks include:

1. A revision of the electrical requirements for Cruzen Observatory along with a review of all calculated voltage drop calculations for the private observatories

2. Provide a GANTT chart indicating project timelines and milestones

3. Provide a Schedule of Values indicating project payment milestones

David Wood expects both SDG&E and County approvals are expected in two to four months. North and South grid projects are separate contractual actions, but Neal will ensure that civil engineering work (trenching) for both will occur at the same time.

s) Membership Project Committee **Hilburn**

First MPC meeting will be Wed night, April 9.
Initial committee membership is:

Jim Love
Mark Smith
Woody Schlom
Bob Davidson
Prascilla Morquecho
Tom Kennedy
Sapi Gilani
Peter Binfield

A board motion to confirm the membership will be scheduled for next month.

t) Strategic Planning Committee **Decker**

The initial meeting of the Strategic Planning Committee was held on March 27 via Zoom.
The members who joined that meeting are:

Damon Blackman
John Downing
Brad Freese
William Cheney
Anthony Long
Peter Li

The meeting agenda included an informal "meet and greet", review of the committee charter, and review of the SDAA Mission Statement. This introductory meeting laid the groundwork for setting up a collaborative environment and documenting our initial high priority goals. Our next meeting is scheduled for April 9.

The committee is seeking Board approval for membership as documented in the charter. The Chairperson is to be determined.

The BOD unanimously approved a motion to approve the membership. (Motion: D. Decker/Second: R. Salinger)

5. Old Business

a) Cleanup. EDCO roll-off bin will arrive 24 April. **Action Item BOD 04-02:** J. Hilburn will generate a Wild Apricot blast to members about the event.

b) DocuSign. D. Decker has been investigating use of DocuSign for SDAA COI statements and it could be used for other official documents such as private pad leases. **Action Item BOD 04-03:** J. Hilburn and D. Koning coordinate to setup DocuSign for SDAA.

c) JSF Coordinator. There is still no JSF Coordinator and action is needed ASAP to secure contracts and permits. There was a general sense that SDAA should sponsor a major public event in Southern California but maybe JSF is not the best option under current conditions. The BOD unanimously approved a motion to motion to skip JSF in 2025 and set up a committee to explore further festival-like options. (Motion: R. Salinger/ Second: K. Searcy). **Action Item BOD 04-04:** D. Decker will inform Menghini.

6. New Business

a) Pad Policy Committee. The board reviewed a charter for the Private Pad Policy Committee presented by M. Smith. This committee incorporates the existing private pad chairman responsibilities and Pad Policy Committee into a single committee. New responsibilities will include harmonizing private pad and TDS site rules and incorporating new grid procedures as they are established. The BOD unanimously approved a motion to approve the charter as amended during the discussion and appoint Mark Smith as chairman. (Motion: K. Searcy/ Second: R. Salinger)

b) Greater San Diego Science and Engineering Fair (GSDSEF) awards. SDAA participates in the GSFSEF as a Professional Society with its own awards including cash, SDAA membership, and an opportunity to present their projects at an SDAA program meeting. The projects were of very quality and the SDAA judges voiced a need to a member who can evaluate neural networks on the team. The BOD unanimously approved a motion to approve sending the budgeted $5000 to the science fair winners as recommended by the SDAA judges. (Motion: K. Searcy/Second: M. Chasin)

c) SDAA Asset Inventory. As part of the expanded audit requirements, SDAA needs an inventory of SDAA property. As the first step, D. Decker accepted an action item to instruct SDAA committee chairmen to inventor SDAA property under their cognizance and to forward the lists to M. Chasin for consolidation. **Action Item BOD 04-05**. J. Hilburn volunteered to inventory virtual assets **Action Item BOD 04-06**.

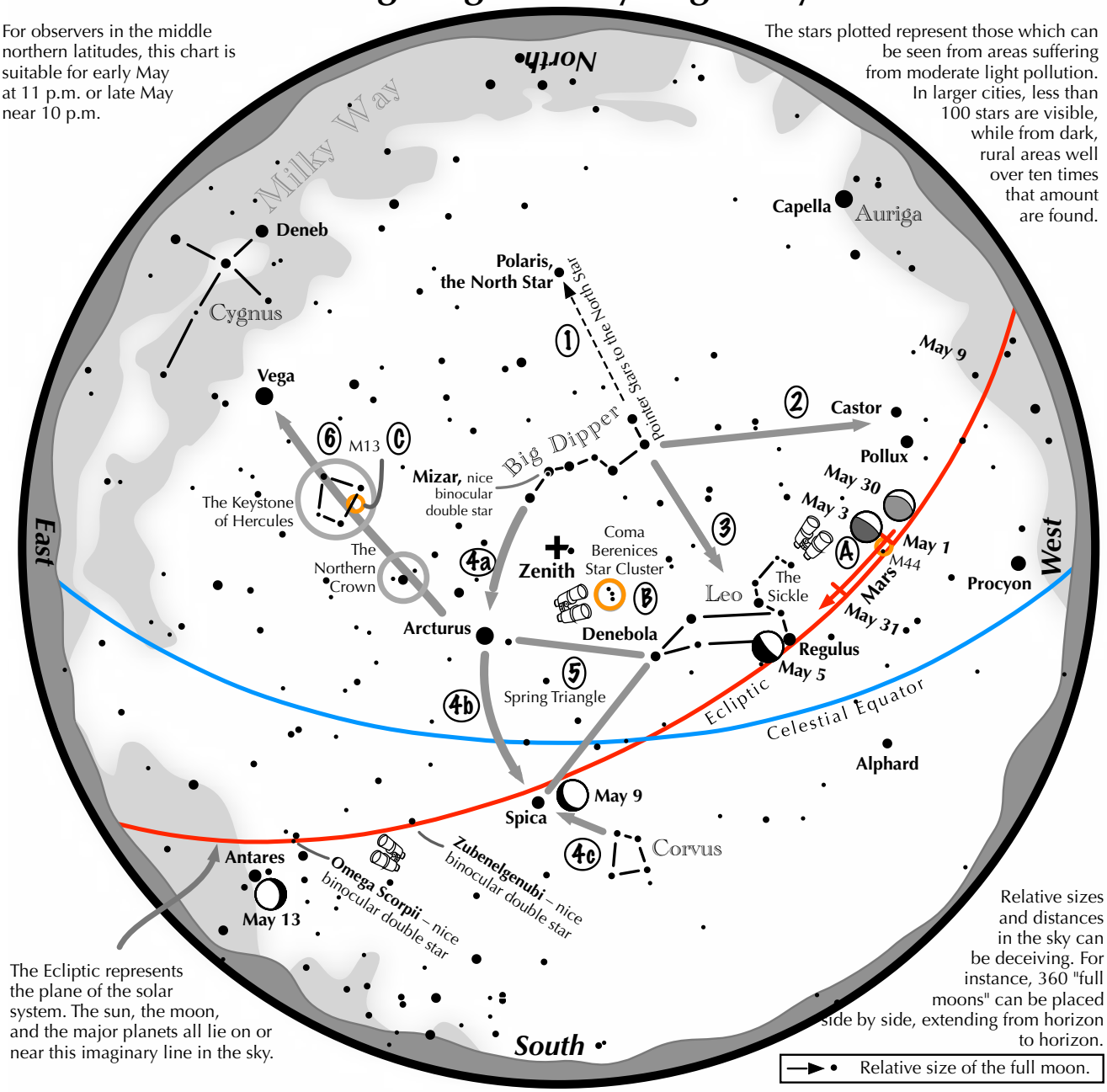
7. Adjournment: The meeting was adjourned at 9:04pm.

San Diego Astronomy Association

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.

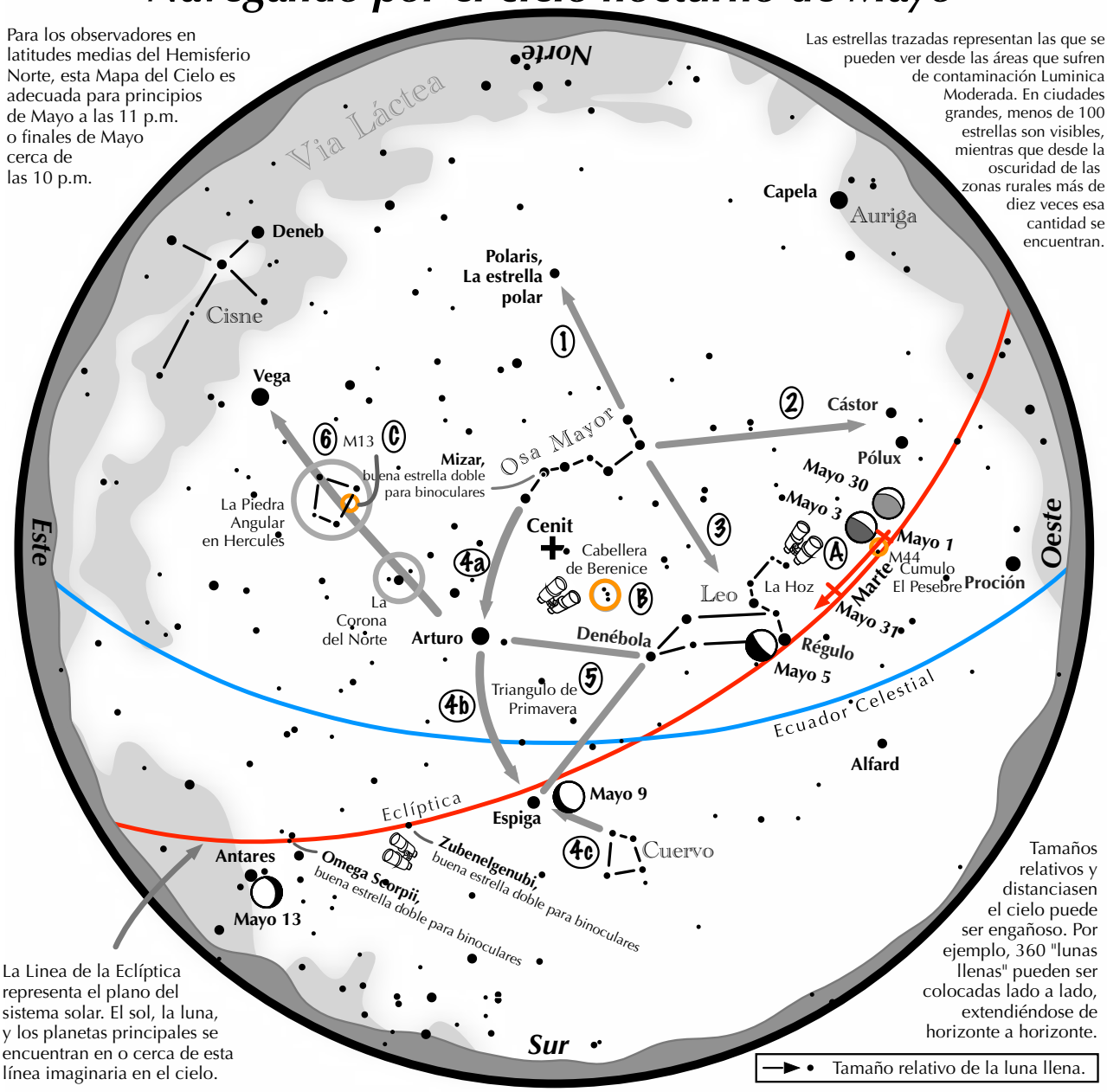
Binocular Highlights

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.

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 Linea 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 distanciasen 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.
3. Directamente debajo del tazón de la Osa Mayor se encuentra Leo con su estrella principal, Régulo.
4. Siga el arco del mango del tazón de la Osa Mayor. Primero cruza Arturo, luego continúa hacia Espiga, luego Cuervo.
5. Arturo, Espiga y Denébola forman el triángulo de primavera, un gran triángulo equilátero.
6. 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.

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.

Traducción al español por Dr. Salvador Aguirre

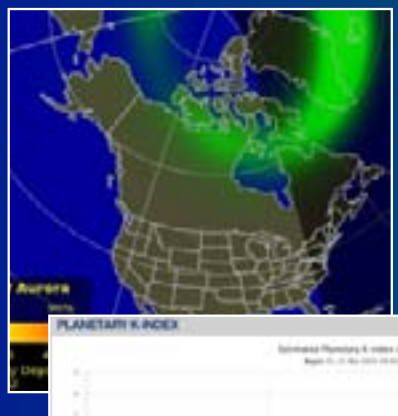
Space Weather Observing Program

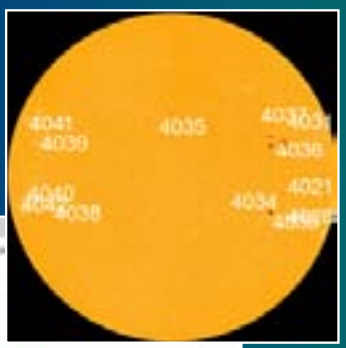
The solar wind greatly affects Earth's magnetic field and those effects can be measured using an inexpensive home-made magnetometer.

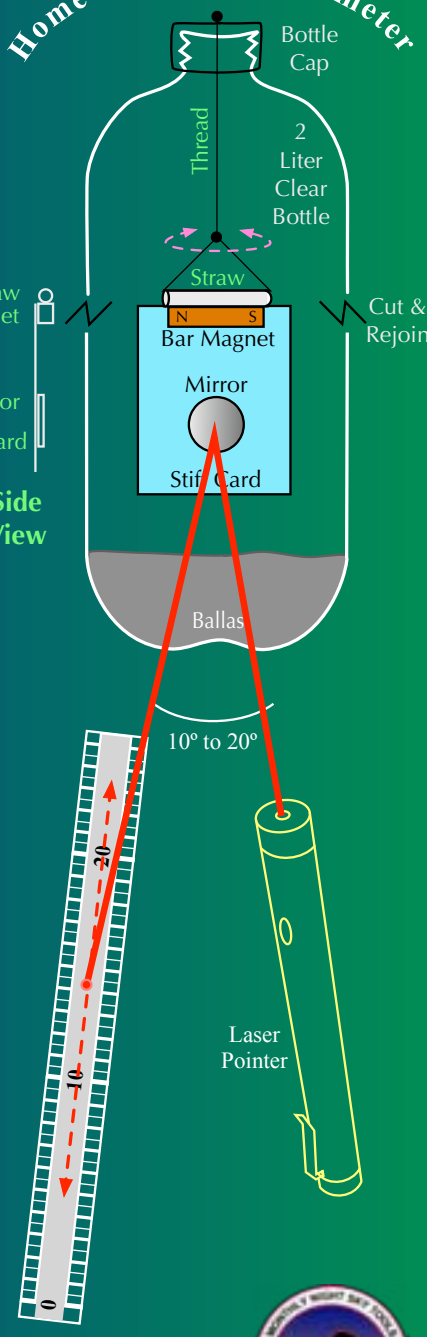
Space Weather Observing Program

- Construct and use your own magnetometer.
- Do a minimum of 100 observations on at least 100 different days.
- Note the location on the meter (or yard) stick where the reflected laser spot is located.
- The 2 liter magnetometer, the laser, and the measuring stick must be located where they will not be disturbed during the program.

- Compare your data with NASA's Planetary K-Index.
- Note sunspot activity as found on Spaceweather.com.
- Note auroral activity as found on Spaceweather.com.







For complete details on this fascinating program:
https://www.astroleague.org/space-weather-observing-program/

2503

Mare Orientale

... this most astounding impact basin is only partially seen

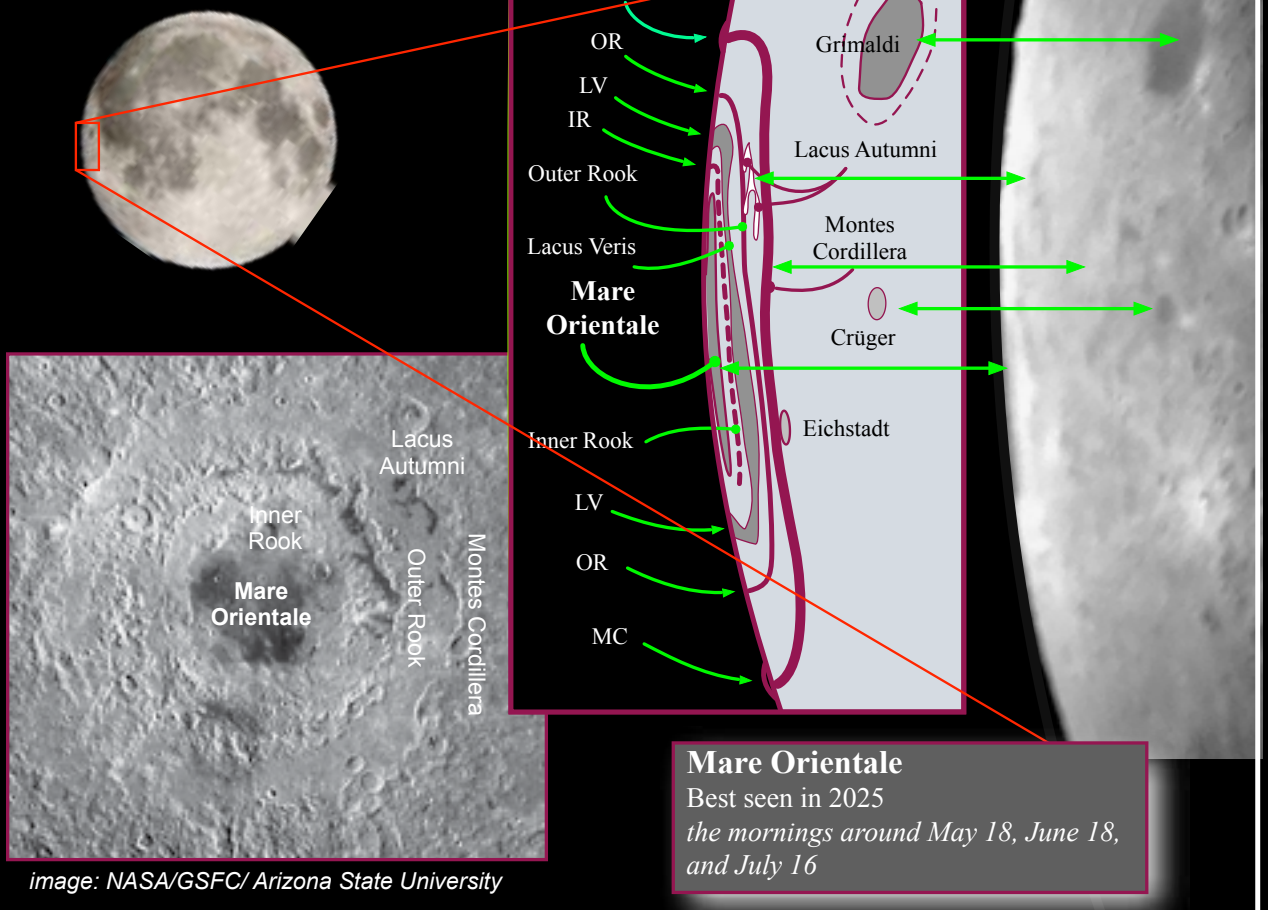


image: NASA/GSFC/ Arizona State University

Mare Orientale
Best seen in 2025
the mornings around May 18, June 18, and July 16

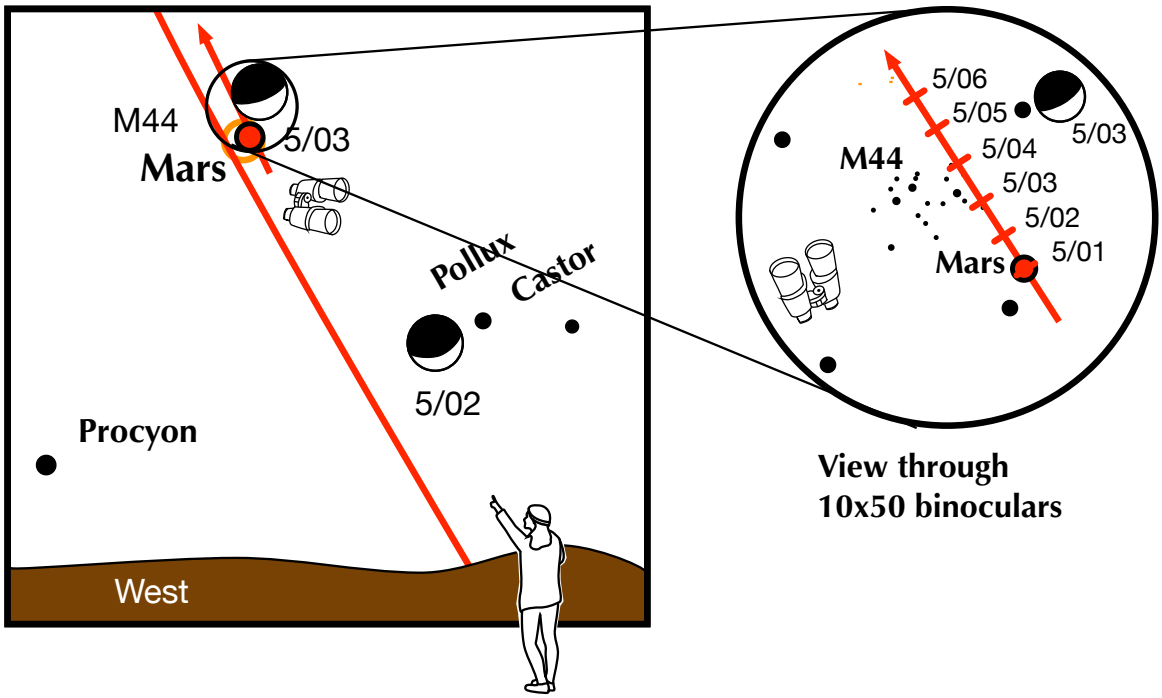
A good viewing of Mare Orientale requires that the Moon be at or near maximum western libration. This happens on three, four, or five days in some, but not all months. Of course, it should not hide in the lunar night, which immediately eliminates fifteen days each month. The three mornings leading up to new Moon are also poor times because the waning thin crescent lies too close to the horizon to give a sharp enough image for a clear, meaningful view.

As a result, opportunities for studying Mare Orientale are infrequent, occurring on fewer than twenty days each year. Generally, four months running present three, four, or five good opportunities each, followed by a string of nine or ten months that present no suitable occasions for viewing it. And then there is the weather!

Identifying Orientale's fascinating features demands steady seeing and moderate magnification.

2504

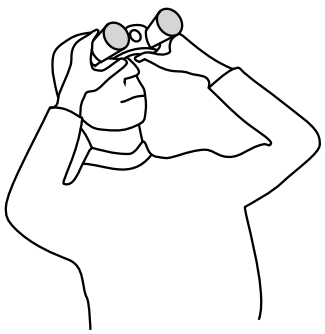
If you can see only one celestial event this month, see this one.



Beginning on May 1, look to the west-northwest 90 minutes after sunset.

• The twin stars of Gemini, Castor and Pollux, will be found forming a horizontal bar low above the horizon.

• On the following evening, the crescent moon moves near Pollux, almost forming a straight line with it and Castor.



• Red Mars slides toward M44, aka the Beehive Star cluster. Use binoculars to find Mars inching closer to the many stellar bees.

• On May 3, the thick crescent moon joins Mars sitting to the upper left of the red planet and above the bees.

• Over the next few evenings, the Red Planet moves past M44, leaving it on May 5.

Private Pad News

by Mark Smith

A short update on the Private Pad Rewire effort. The process has begun, but it will be a long process, and it is unlikely we'll see power restored to the Private Pads until sometime next year. While the preliminary design work had been started even before the BOD formally approved the effort, there is still a lot of work to be done including detailed designs and permitting before we can break ground on the project. Progress on the design and permitting are likely to be fairly slow. The actual construction work will likely be the fastest part of the entire project.

In the meantime, there is a great deal of work that needs to be done to prepare the club for the new grid. Private Pad usage rules need to be reviewed, the lease structure needs to be re-evaluated (it hasn't changed in decades), polices need to be reviewed and updated, and the club needs a better way of dealing with the improvements on the pads. With this in mind, the BOD has decided to put the "committee" back into the Private Pad Committee. A charter for the committee was presented and approved at the last BOD meeting and I'm not recruiting members. Private pad ownership IS NOT a pre-requisite for being on the committee, especially as Private Pad rules and policies overlap with the general TDS rules and policies.

If you are interested in serving on the Private Pad Committee, please let me know. In addition, if you are already a Pad Lessee, please continue to sign into your pad whenever you are at TDS whether you set up on your pad or are using the Public Pads. Although Pad Usage requirements have been waived while there is no power on the pads, the Private Pads Usage Data are the best TDS usage tracking information that we currently have.

If you have any feedback, are interested in leasing a Private Pad, or just have questions about them, please don't hesitate to contact me at pads@sdaa.org or emarksmi@san.rr.com.

Astronomical League Notes

By Mark Smith

As the weather improves and we get back outside, I'd like to return to the Astronomical League Observing Programs this month. We've barely scratched the surface of what the League has to offer with respect to Observing Programs, but these two are somewhat unique.

I'd like to start with the Asterisms Program. It comes in 3 levels; Naked Eye, Binoculars, and Telescope. The first two levels will earn you a certificate while the 3rd will earn you a certificate and a pin. The Naked Eye objects are, as expected, fairly easy to find. Items like Orion's Belt, the Big Dipper, and the Summer Triangle are familiar to most of us, and we could probably complete that part of the program with little effort. The Telescope list (the Binocular List is just the subset of the Telescope List you can find with Binoculars) is more in depth and while there are familiar objects like the ET Cluster, 37, Christmas Tree Cluster, and M6, there are also objects I've never heard of (the Shark, Tennis Racket, and Gas Pump Handle for example). These objects are scattered across the sky making this program easy to work on at any time of year.

The second program I'd like to talk about is the Double Star Observing Program. I'll admit that double stars have always fascinated me. There are a huge variety of them out there and some of them have great contrasts in magnitude and/or color. There are 100 objects on the list, but some of them are actual triples or even quads and a few of them are VERY close together making splitting them a challenge. The League claims that this can be done with a 60mm telescope, and it probably can, but that would be a challenge. As with the Asterisms Program, these objects are scattered across the sky so it can be worked on throughout the year.

If you are interested in what you've read, I invite you to explore what the Astronomical League has to offer and use it to help guide or enrich your astronomy. You may even decide to join the next time you renew your SDAA membership. If you have any questions about the Astronomical League, please don't hesitate to contact me at ALCOR@SDAA.org.

Astronomical.League

on Facebook ...

Monthly sky maps,
Observing activities,
AL LIVE sessions,
League news & a whole lot more!

AL YouTube Channel

Observing Program Previews: What a program requires of the Observer.

Our View from Earth: How to find interesting celestial objects in three minutes. Perfect for club viewing.

San Diego Astronomy Association

SDAA Contacts

Club Officers and Directors

President	Dave Decker	President@sdaa.org	(619) 972-1003
Vice President	Bee Pagarigan	VicePresident@sdaa.org	(760) 703-6183
Recording Secretary	Gene Burch	Recording@sdaa.org	(858) 926-9610
Treasurer	Mike Chasin	Treasurer@sdaa.org	(858) 210-1454
Corresponding Secretary	Dave Wood	Corresponding@sdaa.org	(858) 735-8808
Director Alpha	*-Vacant-*	DirectorAlpha@sdaa.org	
Director Beta	*-Vacant-*	DirectorBeta@sdaa.org	
Director Delta	Gracie Schutze	DirectorDelta@sdaa.org	(619) 857-0088
Director Gamma	Kin Searcy	DirectorGamma@sdaa.org	(858) 586-0974

Committees

Site Maintenance	Committee	TDS@sdaa.org	
Observatory Director	Ed Rumsey	Observatory@sdaa.org	(858) 722-3846
Private Pads	Mark Smith	Pads@sdaa.org	(858) 484-0540
Outreach	Dennis Ammann	Outreach@sdaa.org	(619) 247-2457
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	
New Member Mentor	Dan Kiser	Mentor@sdaa.org	(858) 922-0592
Webmaster	Jeff Stevens	Webmaster@sdaa.org	(858) 566-2261
AISIG	Dave Wood	AISIG@sdaa.org	
Site Acquisition	*-Vacant-*	SecondSite@sdaa.org	
Field Trips	*-Vacant-*	FieldTrips@sdaa.org	
Grants/Fund Raising	*-Vacant-*	Grants@sdaa.org	
Julian StarFest	Bill Cecil	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	
Cruzen Observatory Director	Ross Salinger	cruzen@sdaa.org	
TARO Observatory Director	Dave Wood	TARO@sdaa.org	
TDS Network	Dave Wood	TDSNet@sdaa.org	(858) 735-8808
TDS Operations	Bee Pagarigan	TDS@sdaa.org	
ALCOR (Astronomical League Correspondent)	Mark Smith	ALCOR@sdaa.org	(858) 484-0540

SDAA Editorial Staff
Editor - Andrea Kuhl
since April 2011
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.

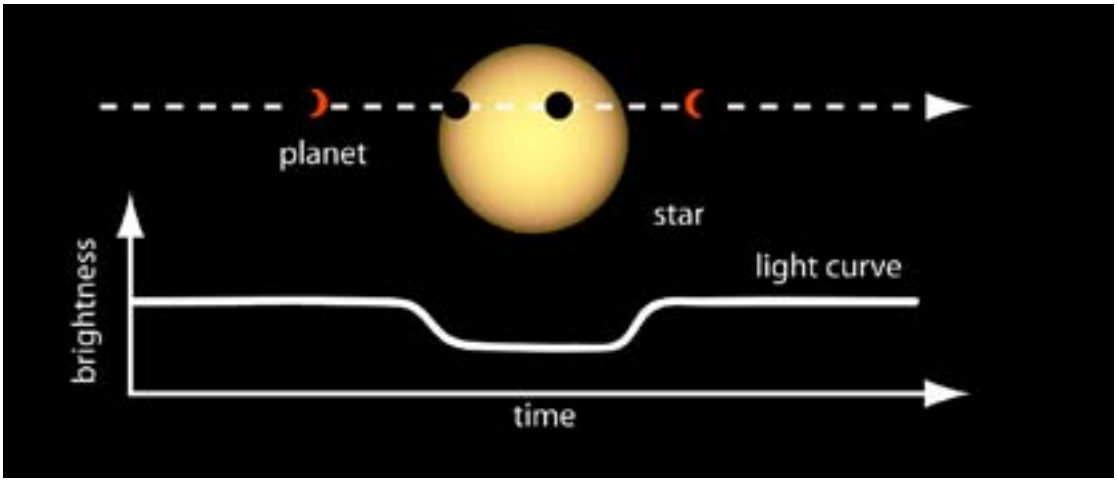
This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit go.nasa.gov/nightskynetwork to find local clubs, events, and more!

May's Night Sky Notes: How Do We Find Exoplanets?

By: Dave Prosper
Updated by: Kat Troche

Astronomers have been trying to discover evidence that worlds exist around stars other than our Sun since the 19th century. By the mid-1990s, technology finally caught up with the desire for discovery and led to the first discovery of a planet orbiting another sun-like star, Pegasi 51b. Why did it take so long to discover these distant worlds, and what techniques do astronomers use to find them?

The Transit Method

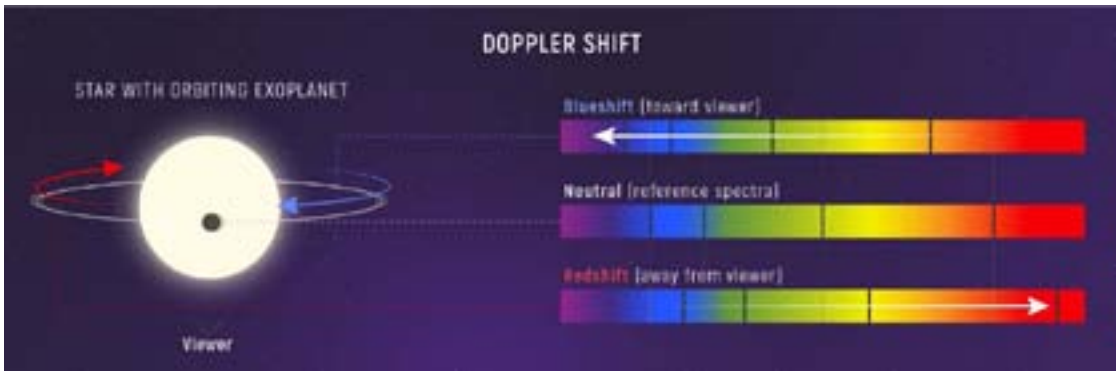


A planet passing in front of its parent star creates a drop in the star's apparent brightness, called a transit. Exoplanet Watch participants can look for transits in data from ground-based telescopes, helping scientists refine measurements of the length of a planet's orbit around its star. Credit: NASA's Ames Research Center

One of the most famous exoplanet detection methods is the **transit method**, used by Kepler and other observatories. When a planet crosses in front of its host star, the light from the star dips slightly in brightness. Scientists can confirm a planet orbits its host star by repeatedly detecting these incredibly tiny dips in brightness using sensitive instruments. If you can imagine trying to detect the dip in light from a massive searchlight when an ant crosses in front of it, at a distance of tens of miles away, you can begin to see how difficult it can be to spot a planet from light-years away! Another drawback to the transit method is that the distant solar system must be at a favorable angle to our point of view here on Earth – if the distant system's angle is just slightly askew, there will be no transits. Even in our solar system, a transit is very rare. For example, there

were two transits of Venus visible across our Sun from Earth in this century. But the next time Venus transits the Sun as seen from Earth will be in the year 2117 – more than a century from now, even though Venus will have completed nearly 150 orbits around the Sun by then!

The Wobble Method



As a planet orbits a star, the star wobbles. This causes a change in the appearance of the star's spectrum called Doppler shift. Because the change in wavelength is directly related to relative speed, astronomers can use Doppler shift to calculate exactly how fast an object is moving toward or away from us. Astronomers can also track the Doppler shift of a star over time to estimate the mass of the planet orbiting it. Credit: NASA, ESA, CSA, Leah Hustak (STScI)

Spotting the Doppler shift of a star's spectra was used to find Pegasi 51b, the first planet detected around a Sun-like star. This technique is called the **radial velocity or "wobble" method.** Astronomers split up the visible light emitted by a star into a rainbow. These spectra, and gaps between the normally smooth bands of light, help determine the elements that make up the star. However, if there is a planet orbiting the star, it causes the star to wobble ever so slightly back and forth. This will, in turn, cause the lines within the spectra to shift ever so slightly towards the blue and red ends of the spectrum as the star wobbles slightly away and towards us. This is caused by the blue and red shifts of the planet's light. By carefully measuring the amount of shift in the star's spectra, astronomers can determine the size of the object pulling on the host star and if the companion is indeed a planet. By tracking the variation in this periodic shift of the spectra, they can also determine the time it takes the planet to orbit its parent star.

Direct Imaging

Finally, exoplanets can be revealed by **directly imaging** them, such as this image of four planets found orbiting the star HR 8799! Space telescopes use instruments called **coronagraphs** to block the bright light from the host star and capture the dim light from planets. The Hubble Space Telescope has captured images of giant planets orbiting a few nearby systems, and the James Webb Space Telescope has only improved on these observations by uncovering more details, such as the colors and spectra of exoplanet atmospheres, temperatures, detecting potential exomoons, and even scanning atmospheres for potential biosignatures!

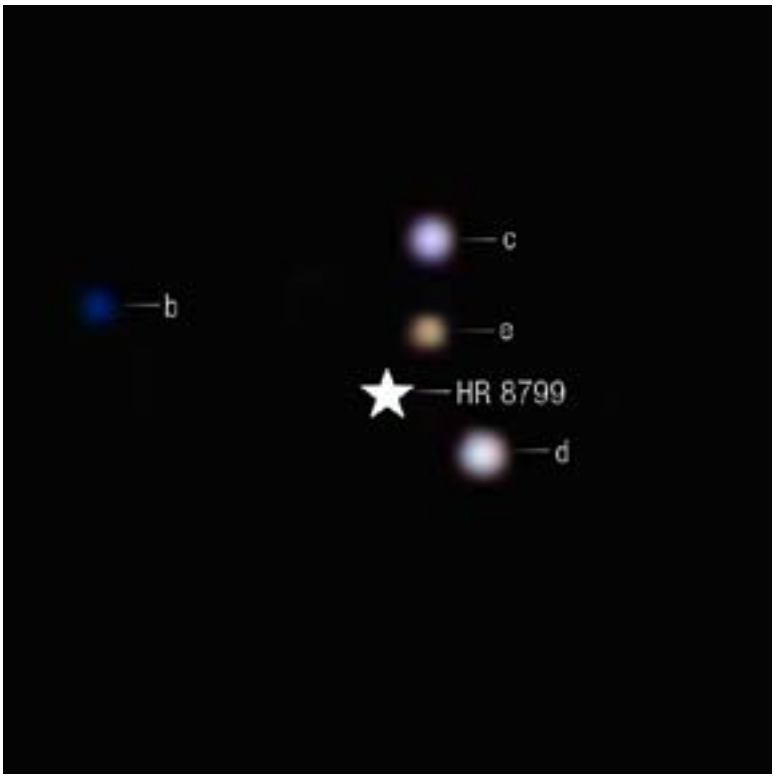


Image taken by the James Webb Space Telescope of four exoplanets orbiting HR 8799. Credit: NASA, ESA, CSA, STScI, Laurent Pueyo (STScI), William Balmer (JHU), Marshall Perrin (STScI)

You can find more information and activities on NASA's Exoplanets page, such as the Eyes on Exoplanets browser-based program, The Exoplaneteers, and some of the latest exoplanet news. Lastly, you can find more resources in our News & Resources section, including a clever demo on how astronomers use the wobble method to detect planets!

The future of exoplanet discovery is only just beginning, promising rich rewards in humanity's understanding of our place in the Universe, where we are from, and if there is life elsewhere in our cosmos.

2025 TDS Star Party Schedule

Date	Type	Sunset	Astro. Twi.	Moonrise(set)	Closing	Illumination
Jan-04-2025	Public	4:56 PM	6:23 PM	(10:11 PM)	9:30 PM	28.3%
Jan-25-2025	Member	5:15 PM	6:40 PM	4:44 AM	9:30 PM	16.3%
Feb-01-2025	Public	5:21 PM	6:46 PM	(9:08 PM)	10:00 PM	14.9%
Feb-22-2025	Member	5:40 PM	7:02 PM	3:26 AM	10:00 PM	31.8%
Mar-01-2025	Public	5:46 PM	7:08 PM	(8:00 PM)	10:00 PM	5.0%
Mar-29-2025	Member	7:06 PM	8:30 PM	(7:47 PM)	11:30 PM	0.2%
Apr-19-2025	Public	7:21 PM	8:49 PM	1:47 AM	11:30 PM	65.5%
Apr-26-2025	Member	7:26 PM	8:56 PM	5:45 AM	11:59 PM	1.7%
May-17-2025	Public	7:42 PM	9:17 PM	12:27 AM	11:59 PM	79.6%
May-24-2025	Member	7:46 PM	9:24 PM	4:16 AM	11:59 PM	8.6%
Jun-21-2025	Member	7:59 PM	9:41 PM	2:50 AM	11:59 PM	19.3%
Jun-28-2025	Public	8:00 PM	9:41 PM	(10:55 PM)	11:59 PM	15.1%
Jul-19-2025	Public	7:55 PM	9:32 PM	1:29 AM	11:59 PM	32.1%
Jul-26-2025	Member	7:51 PM	9:26 PM	(9:22 PM)	11:59 PM	5.2%
Aug-16-2025	Public	7:31 PM	9:00 PM	12:15 AM	11:59 PM	46.0%
Aug-23-2025	Member	7:23 PM	8:50 PM	7:39 AM	11:59 PM	0.4%
Sep-13-2025	Public	6:56 PM	8:19 PM	11:06 PM	11:00 PM	60.5%
Sep-20-2025	Member	6:47 PM	8:09 PM	6:27 AM	11:00 PM	1.1%
Oct-18-2025	Member	6:11 PM	7:33 PM	5:17 AM	10:30 PM	7.1%
Oct-25-2025	Public	6:04 PM	7:26 PM	(8:37 PM)	10:30 PM	16.9%
Nov-15-2025	Public	4:47 PM	6:12 PM	3:07 AM	9:00 PM	18.1%
Nov-22-2025	Member	4:44 PM	6:10 PM	(6:26 PM)	9:00 PM	6.3%
Dec-13-2025	Public	4:43 PM	6:11 PM	1:58 AM	9:00 PM	33.2%
Dec-20-2025	Member	4:46 PM	6:14 PM	(5:17 PM)	9:00 PM	0.7%

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!

MEMBERSHIP INFORMATION

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.