# San Diego Astronomy Association Celebrating Over 50 Years of Astronomical Outreach



May 2023

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

#### Next SDAA Business Meeting

May 9th at 7:00pm 10070 Willow Creek Rd San Diego, CA 92131 Via Zoom

**Next Program Meeting** May 17th at 7:00pm Live stream

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

### **Program Meeting May 17th**

Topic: Focus on Palomar Observatory Speaker: Steve Flanders, Kin Searcy, others



2023. In commemoration, SDAA will focus on the history, construction, and science of the observatory and the iconic telescope that was the largest effective telescope in the world from its dedication until Keck in 1993. Although no longer the largest, Palomar Observatory is an active research observatory with modern instrumentation, on sky an average of 300 nights per year, that has facilitated groundbreaking discoveries such as quasars, brown dwarfs, supernovae, exoplanets, and the familiar Green Comet. The image above is of the dedication on June 3, 1948.

#### The May 2023 Program Meeting will be virtual via ZOOM

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

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



### San Diego Astronomy Association Board of Directors Meeting

April 11, 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; Alicia Linder, Corresponding Secretary; Dave Wood, Director; Bee Pagarigan, Director; Gracie Schutze, Director; Steve Myers, Primary Grid Reconstruction committee.

#### 2. Approval of Last Meeting Minutes

The March meeting minutes were approved.

#### 3. Treasurers & Membership Report

The treasurer's report was approved. Mike reported that we're doing well and so far, our utility costs are under budget. He has renewed our Wild Apricot subscription for 2 years, paid our Science Fair winners and transferred money from checking to savings. We're still planning on switching banks and Mike has received a quote for Directors & Officers insurance and we hope to start coverage in April. We will probably need to schedule a meeting with the attorney to review our options in our continuing attempt to recover the \$5,000 lost when Chase Bank cashed a fraudulent check on our account.

#### 4. Standard Reports

#### a. <u>Site Maintenance Report:</u>

No report other than the Spring Clean-up will be on May 20<sup>th</sup>.

#### b. <u>Observatory:</u>

Winter weather continues to pound TDS. We almost got in one star party in March. Equipment is in great condition. Opened the roof to 90% clouds which didn't break for the 2 hours we waited. Was a nice afternoon/evening at TDS anyway. April will be better!

#### c. Loaner Scope Report:

SDAA-004 Meade LX-90; SDAA-023 Orion XT10; SDAA-026 Zhumell; SDAA-027 beginner astrophotography rig; SDAA-028 Bushnell Voyager. All but SDAA-027 are due back in May; SDAA-027 is due back in June. When I have some spare time (probably in May), I'll collect the Celestron CGX and 8" Astrograph and work on getting that loaner setup tested and documented. I think we're going to have a lot of interest in that set.

d. <u>Private Pad Report:</u>

We reviewed the proposal to put a SkyShed Dome on Pad 43, and after viewing the very detailed plans and pictures of the site, tentatively approved the plan pending a few small details to be worked out with the pad holder and Mark Smith.

#### e. <u>Program Meetings Report:</u>

Program meetings from April through July are covered, so the next available open date is August 16. June will be in-person at Mission Trails and we will try to have it available on Zoom as well. Science Fair winners have been invited to present and are being scheduled.



- f. <u>AISIG Report:</u> Dave Wood is working to get AISIG restarted.
- g. <u>Newsletter Report:</u> As always, the newsletter looks great – Thanks, Andrea!
- h. <u>Website Report:</u> Jeff Stevens has set up a page on the SDAA website for the Cruzen Observatory. https://sdaa.org/cruzenobservatory/
- i. <u>Social Media:</u> No report
- j. <u>Outreach Report:</u>
  Once again weather impacted our ability to complete events. Of the (5) completed, (2) were schools where we were well received. It is good to be back in schools again.

2023	March	YTD
Events Completed	5	20
Events Cancelled	6	20
Total Attendance	540	2240

Here are numbers for March:

#### k. <u>TARO Report:</u>

Still awaiting the return of the rotator from Optec - An RMA was issued but they are behind on repairs.

#### I. <u>Cruzen Report:</u>

The March excursion has the Cruzen observatory essentially ready for SDAA members to use it. In March, we finished up the final few items:

- Laptop is now cabled to the G11 mount and has been tested with ASCOM + Stellarium to control the mount. The laptop has a red filter installed.
- Adjustable red lighting was added to the storage cabinet, so the eyepieces are easier to see.
- Photos were taken for inclusion in the operations manual
- The operations manual has been finalized to v1.0 and has been professionally printed and bound.

• The SDAA.org website now has a Cruzen Observatory page. Bee and I are working on getting a list of ~10 SDAA members together for the initial training session, scheduled for April 22. These initial training attendees will help us improve the documentation and will use the observatory for several weeks to validate the reservation process and the facility configuration. The first training will be held in a few months, probably July or so, and every six months after that.



- m. <u>Merchandise Report:</u> A few shirts and a hat were sold.
- n. <u>Astronomical League Report:</u> Nothing to report.

#### o. <u>JSF Report:</u>

Bill Cecil reports that JSF 2023 is scheduled for August 11th – 13th. Thanks to Dan and Sandy Kiser for providing us with all the information they have from their years running JSF. This was a big help and should make it easier for us to have another successful JSF this year. Bill has received quotes for the restrooms, golf cart, tent and dumpster and is working on the rest of the logistics, including vendors and donations for raffle prizes. Bill has an article ready for the May newsletter and we need volunteers to help out. We'll also be sending out an email blast via Wild Apricot asking for help.

#### p. <u>Primary Grid Reconstruction Report:</u>

A Zoom meeting was held on March 20th with Paul Ericson, the electrical engineer from Stentec and Ed Rumsey. We discussed electrical usage over the past 2 years and how best to move the project forward. Two items of note:

1) We may upgrade the 100-amp service that was installed last year to service the upper grid with a 200 amp service and split the power between two meters, one for the private observatories and a new electrical service to service the Lipp Observatory and warming room, the bath rooms and the public pads.

2) In the past we've been estimating the project costs to be in the \$65,000 to \$75,000 range. This estimate may be somewhat low - Paul thought we might be in the \$100K plus neighborhood when the 1st phase is completed. - Paul is working on holding the engineering costs down to the \$5-\$6k range by convincing Stantec to donate some of the engineering resources (CAD development, Permit generation) to the club

#### 5. Old Business:

6.

a.	Update on Google Workspace Email	Myers
	Steve reported that we're close to making the switch to Google We	orkspaces, and just need to finalize the
	Training, Roles, Time-frame and post cut-over support	
b.	Spring Clean-up is set for May 20 <sup>th</sup>	Decker
c.	Other Old Business - none	Decker
New	Business:	
a.	By-laws Clarification re: Savings Account	Decker
	We need to have a meeting to clarify the by-laws regarding how m	uch we can spend.
b.	Pad 43 – see Private Pad report	Smith
c.	Site Rules Interim Policies – Mike C is working on an updated	Decker
	Site Rules policy and will forward it to the Board for review.	
d.	Other New Business - none	Decker

7. Adjournment: The meeting was adjourned at 9:12pm.













Beginning in the second week of May, look to the west-northwest 90 minutes after sunset.

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

• Red Mars, sporting a brightness mid way between those two stars, rises nightly, eventually sliding directly to their left.

• On **May 16**, the three luminaries form a straight line, effectively creating another member of Gemini, the Triplets!



• Look at Venus, brilliantly shining below them. Can you see the moderately bright star Mebsuta in the glare of Venus? Binoculars will certainly help.

• The bright stars Procyon and Capella act like opposing bookends for the scene.

• Over next two weeks, watch Mars approach M44, the Beehive cluster, and Venus move near Castor and Pollux.







#### **Otros Soles: Iota & Kappa Boyero** Cómo encontrar a Iota y Kappa en una tarde de mayo

Mire hacia Noreste hacia la Osa Mayor. Siga la curva del mango hasta que interseccione con la Estrella brillante Arturo. De la estrella final de Osa Mayor dirija su mirada al Horizonte Noroiental, esta linea pasa por las estrellas lota, Kappa y Theta Boyero.

#### **lota Boyero** A-B separació

A-B separación: 39 sec A magnitud: 4.8 B magnitud: 7.4 PA: 32° A & B color: blanca

### Kappa Boyero

A-B separación: 13 sec A magnitud: 4.5 B magnitud: 6.6 PA: 235° A & B colores: blanca





#### May 2023 Another Look Notes

New Moon! The New Moon in May is Friday May 19, 2023 11:53 AM EDT or 3:53 PM UTC May Full Moon is May 5; The Full Flower Moon in May describes all the flowers blooming in spring. Native Americans called it Budding Moon, Egg Laying Moon, and Planting Moon. The Anglo-Saxon name is Milk Moon, while the Celtic and Old English names are Mothers' Moon, Bright Moon, Hare Moon, and Grass Moon. In Spanish it is La Luna Ilena, in French it is La Plein Lune and in Italian La Luna Piena.



the gills with galaxies...There are so many galaxies that its makes more sense to only talk about the ones Messier listed as not comets.

In Ptolemy's time, Coma Berenices was not a constellation but a sprinkling of stars he assigned to Leo, a sort of a tuft in its tail that was probably what we see now as Melotte 111, over by Gamma γ. Then, Caspar Vopel included her on his globe in the mid 1530's. Mercator placed her on his globe in the mid 1500's, in Mercator's case he named the constellation Hair. then, none other but the illustrious personality Tycho Brahe, in 1602, cataloged the stars separately.

Looking at Coma Berenices the constellation, Wow, she's great. Then, when you read the histories of Berenice the person, you'll find that her life was full of politics, family and sadly, loss. Berenice was a queen of Egypt in the later years of the Ptolemaic dynasty during Greek's ascendancy. Berenice's



husband, also her brother, went to war and we are told that Berenice promised her hair to Aphrodite if her husband came home safely. Thus, it happened and Berenice's hair was placed in a temple to Aphrodite soon after which it was promptly stolen. Clearly this was done by divine intent and Berenice's hair was placed in the heavens for all to admire.

Of course there is not all that much to admire with just your eyes alone. Back in her time, the dark skies along the Nile allowed us to see a sprinkling of fainter naked eye stars. Alpha, Beta and Gamma are the three brightest stars in Coma, each at 4<sup>th</sup> magnitude. Alpha's name is Diadem and is a double of equal 5<sup>th</sup> magnitude stars. 5<sup>th</sup> magnitude 41 Comae Berenices has a planet and 31 Comae Berenices has been foisted with the rather unfortunate name of Polaris Galacticum Borealis, a misspelling, as the closest star to the North Galactic pole. By the way, since Polaris is feminine, the correct spelling should be Polaris Galactia Borealis. I doubt either will catch on.



Firmamentum Sobiescianum

Canis Venatici is another story. Considered by Ptolemy as "unformed" stars in Ursa Major it wasn't until Hevelius added the dogs to his atlas in 1687 that that area was identified as a constellation.

Again, as happened before, Canis Venatici became a constellation by miss-translation. In Ptolemy's text, some of the stars in <u>Boötes</u> represent the Herdsman's club or even a shepherd's crook as can be seen on a few very old celestial globes. This was before the alternate designation of Bootes as hunting the bear rather than a shepherd or herdsman. The translator loosely translated the Greek word for club to the Arabic for spear-shaft with a hook, what we would identify today as a Halberd. When the Arabic phrase he used was later translated to Latin, the translator erred again and mistook one of the Arabic words as meaning dogs.

Early in the 1500's a mathematician and mapmaker named Petrus Apianus drew his chart <sup>302</sup> with dogs. Later that century Mercator, same one as before, followed with his globe showing





the dogs. Hevelius was next in the 17<sup>th</sup> century showing his now famous collection of new constellations.

The constellation chart of the dogs is from two pages of Elijah Burrit's "Geography of the Heavens" published in 1873 and found in the Library of Congress. I clipped pieces from two separate maps and merged them together.

The northern dog Hevelius named <u>Asterion</u> or <u>Star</u> and the southern dog <u>Chara</u>, meaning <u>Joy</u>.

The name Chara later began to be used specifically to refer to the star Chara –  $\beta$  Canum Venaticorum.

So, in 1690 Hevelius added the Giraffe, the Unicorn, the Little Lion, the Little Triangle, Herschel's Telescope and the Lynx. The drawing above is a portion if the frontispiece of Hevelius's atlas "<u>Firmamentum</u> <u>Sobiescianum</u>" printed in 1687. It shows Lynx, Canis Venatici, Vulpecula, Leo Minor and Lacerta. In the top left is Cerberus, since forgotten as is Herschel's Telescope.



Canes Venatici contains four named stars. The star names are Chara, Cor Caroli, La Superba, and Tuiren.

La Superba has interest because it is the brightest carbon star of its designation in the sky, meaning it is very red. Cor Caroli is a double but the interesting one is 12<sup>th</sup> magnitude Tuiren, HAT-P-36. Tuiren has a Jupiter sized planet named Bran. The names come from Irish folklore.

Between the two constellations are four globular clusters; M3-6th mag., M53-7th mag, NGC 5053-9th mag and NGC 4147- 10<sup>th</sup> magnitude. https://ocastronomers.org/wp-content/uploads/2019/01/M53-00X-LRGB-A2B-OCA.jpg https://ocastronomers.org/wp-content/uploads/2019/01/m003.jpg https://www.flickr.com/search/?text=ngc 4147

Coma Berenices contains Messier objects: M53, M64 (Black Eye), M85, M88, M91, M98, M99, M100. and the Caldwell objects: C35, C36, C38.





Canis Venatici has Messier's M3, M51 (Whirlpool), M63 (Sunflower), M94, M106, and the Caldwell objects: C21, C26, C29, C32 (Whale).

In addition there is NGC 4565 (Needle) [Joe Neu's favorite], Melotte 111, the Coma Star Cluster and the Coma Galaxy Cluster.

There are a number of Caldwell objects close to each other at the border between the two constellations, all great star party objects. Caldwell's 32-Whale, 35-Coma Star Cluster, 36 and 38-Needle. Coma\_Cluster\_CE\_20040409\_01.jpg

Needle Galaxy (NGC 4565) – Bill Hall https://ocastronomers.org/wp-content/uploads/2018/12/NGC4565-80mC6F875r.jpg

Whale Galaxy (NGC 4631, Caldwell 32, Arp 281)

https://ocastronomers.org/wp-content/uploads/ 2018/12/ngc4631-whale.jpg Greg Pyros2007 Larry Arnold

https://ocastronomers.org/wp-content/uploads/ 2018/12/NGC4559\_CE\_20050312\_01.jpg Chuck Edmonds 2005







The individual galaxies

are each in the 9<sup>th</sup> magnitude, so easy to find. C35, the Coma Cluster is more for pleasurable galaxy hopping, striving to identify each galaxy as you find it.

The other three Caldwell objects are Caldwell 21, C26the Silver Needle and C29, all big and all 10<sup>th</sup> magnitude.

NGC 5005 (Caldwell 29) https://www.astrobin.com/3iza07/?q=ngc 5005 Aurelio55

https://www.flickr.com/search/?text=caldwell 26 Crowson 2020

NGC 4449 https://www.astrobin.com/ccnrzb/J/?q=ngc 4449 Robert S





Also near the border between the two constellations near Gamma

 $\gamma$  Com is the Coma Star Cluster, also known as Melotte 111 and Collinder 256. Mel 111 is a nice



sprinkling of 5<sup>th+</sup>magnitude stars. As previously mentioned, some references state that Mel 111 was the original Berenices Hair. Melotte 111 https://nicolasillustrations.co

There are some very interesting regions sprinkled about the two constellations. Between Beta and Gamma Comae Berenices is a number of stunning areas. Close to Beta is the North Galactic Pole (Polaris Galactia Borealis). Between it and Beta is NGC 4889 13<sup>th</sup> mag.– Caldwell 35 and one of the central galaxies of the Coma Cluster – Abell 1656. Further along ate NGC 4559, 10<sup>th</sup> mag. – Caldwell 36, followed soon after by NGC 4565 10<sup>th</sup>



mag. – Caldwell 38 and Gamma Comae Berenices, anchored by the huge Comae Berenices Star Cluster, Melotte 111, chock full of 4<sup>th</sup> and 5<sup>th</sup> magnitude stars. Near Gamma is 10<sup>th</sup> magnitude NGC 4274, brightest member of a compact group.

#### https://www.astrobin.com/245205/?q=ngc 4490 Carsten Dosche 1916

There is also an interesting area around Beta Canum Venaticorum. The planet Tuiren is near. Very close to the "Cocoon" galaxy, NGC 4485 and its companion NGC 4490.



Down near the bottom of Cvn near C32, the Whale, is a very interesting galaxy that deserves some study. NGC4656 and NGC4647 are what appears to be a single highly distorted 11<sup>th</sup> magnitude galaxy spread out on it long axis, slightly resembling a hockey stick. In actuality, there are two galaxy nuclei to find.



https://cseligman.com/text/atlas/ngc46a.htm

Near the center is NGC 4656 and at the top of this image at the crook of the shaft is NGC 4657.

At long last we come to that swarm of galaxies near Coma Berenices border with Virgo. There are seven bright Messier galaxies grouped together: M's 64, the black eye, 85, 88, 91, 98, 99 and 100.



https://ocastronomers.org/wp-content/uploads/2019/01/m098.jpg

**M98** has an almost edge on tilt towards us so it is narrow and long. At 10<sup>th</sup> magnitude it is bright and should hold up to some magnification. It is almost 10 min across, so you may be able to see some detail in the arms.





**M91** is interesting. Although it is a magnitude faint than many of its neighbors at 11<sup>th</sup>, it is one of those distinct barred galaxies that show off very nicely. I massaged this image to bring out the spiral arms a



M88

little more. You can see the original by clicking on the hyperlink.

https://ocastronomers.org/wp-content/uploads/2019/01/m088.jpg - 30second exposure, taken on 15 May 1994

Tilted away or maybe towards us at what looks like a 60° angle, 10<sup>th</sup> magnitude M88 is one of the crown jewels of the Virgo cluster.



https://ocastronomers.org/wp-content/uploads/2018/12/M99-colorized.jpg

**M99** is another supernova hunting ground. It is 10<sup>th</sup> magnitude Be sure to try to see how the one spiral arm juts out from the main galactic disk. Is there

maybe an invisible companion near?

#### https://ocastronomers.org/wp-content/uploads/2019/01/m100.jpg

**M100** is one of the largest members of the Virgo cluster and is very bright at 10<sup>th</sup> magnitude. It has two bright spiral arms and a bright nucleus. M100 is also a happy hunting ground for supernova searchers, the last one in 2006. If you have a slightly larger telescope, look for M100's 15<sup>th</sup> magnitude companion galaxy NGC 4323.

The <u>Black Eye Galaxy</u> (Messier 64) is a spiral galaxy with an apparent magnitude of 9.36, it is a laboratory in the study in galactic dynamics.





https:ocastronomers.org/wp-content/uploads/ 2018/12/M64-36mddpccdshpr1-copy.

**M85** is a double galaxy field made up of a large 10<sup>th</sup> magnitude spiral and a smaller 11<sup>th</sup> magnitude barred spiral. It is also a hunting ground for supernova.



http:www.astronomersdoitinthedark.com/index.php?c=135&p=500

This is beautiful piece of sky. Of course this is just a primer on these beautiful spring constellations. Deep dives into galaxies and clusters of galaxies and even more await you.

Dark Skys

Dave Phelps



	<b>SD</b> AA	Contacts	
	Club Officers	s and Directors	
President	Dave Decker	President@sdaa.org	(619) 972-1003
Vice President	Kin Searcy	VicePresident@sdaa.org	
Recording Secretary	Gene Burch	Recording@sdaa.org	(858) 926-9610
Treasurer	Mike Chasin	Treasurer@sdaa.org	((858) 210-1454
Corresponding Secretary	Alicia Linder	Corresponding@sdaa.org	
Director Alpha	Dave Wood	DirectorAlpha@sdaa.org	(858) 735-8808
Director Beta	Hiro Hakozaki	DirectorBeta@sdaa.org	(858) 869-9507
Director Delta	Gracie Schutze	DirectorDelta@sdaa.org	(619) 857-0088
Director Gamma	Bee Pagarigan	DirectorGamma@sdaa.org	(760) 703-6183
	Com	mittees	
Site Maintenance	Ben Grunbaum	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	(858) 547-9887
New Member Mentor	Dan Kiser	Mentor@sdaa.org	(858) 922-0592
Webmaster	Jeff Stevens	Webmaster@sdaa.org	(858) 566-2261
AISIG	-Vacant-	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	Paul Krizak		
TARO Observatory Director	Dave Wood	TARO@sdaa.org	
Governing Documents	TBD		
TDS Network	Dave Wood	TDSNet@sdaa.org	(858) 735-8808
Amateur Telescope Making	-Vacant-		
ALCOR (Astronomical League	Correspondent) Dave Decker	ALCOR@sdaa.org	(619) 972-1003

SDAA Editorial Staff

Editor - Andrea Kuhl newsletter@sdaa.org Assistant Editor: Craig Ewing Have a great new piece of gear? Read an astronomy-related book that you think others should know about? How about a photograph of an SDAA Member in action? Or are you simply tired of seeing these Boxes in the Newsletter rather than something, well, interesting?

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



### FOR SALE: Astro-Physics Mach 1 GTO - Full Package





At long last, I have come into possession of a higher-capacity mount at a price I could not refuse, and so I will be parting with my beloved Mach1 GTO CP3. I am sure whomever takes it will cherish it and put it to good use. It is in Excellent condition, purchased in 2011, and comes with GTOCP3 with the "Q" chip, GTO Keypad, 4 x 9 lb. AP counterweights, 1 x 6 lb. AP counterweight, 1.125" CW shaft, Casady LSafety CW shaft safety stop, RAPAS, Eagle Pier, Pelican cases for the mount, accessories and counterweights, and Orion bag for the Eagle Pier.

#### New / Excellent Condition Values

#### Mount/Accessories:

- 2011 Mach1 mount Excellent Condition \$6,350.00
- 8.5" dovetail mounting plate fits Losmandy D-series dovetail plates (DOVELM2) \$120.00
- 1.125" Counterweight Shaft (M8084-B) \$72.00
- 9 lb. Counterweights x 4 (9SLCWT) \$740.00
- 6 lb. Counterweight x 1 (6SLCWT) \$165.00
- Right Angle Polar Align Scope (RAPAS) \$445.00
- RAPAS Adapter for Mach1 (RAPM1) Original end cap included \$109.00
- GTO Keypad with Keypad Protector \$980.00

Mount/Accessories Subtotal: - \$8,981.00

#### **Pier/Tripod:**

- 2011 Eagle Pier excellent minor scuffs along leg lock tracks \$1,550.00
- Soft Bag for Eagle Pier (Orion) \$70.00

Pier/Tripod Subtotal: - \$1,620.00

#### Cases:

• Pelican Cases for Mount, Accessories, and CWs - \$600.00 Cases Subtotal: - \$600.00

#### Total: \$11,201.00 (minus >25%) \$ 8,400.00

Paypal+4%, buyer pays shipping/insurance

More pictures available upon request

My ad is up on Astromart.com – Ad 563301

If you are not on Astromart, I can be reached at:

Cell: 858-442-2030 Email: timothyadamlewis@gmail.com



### Julian StarFest 2023

Julian StarFest brought to you by the San Diego Astronomy Association will be August 11-13, 2023 at the Menghini Winery, located outside the town of Julian. The town is famous for its apple pies, specialty shops, restaurants and back country hospitality.

Events planned for StarFest include:

- Free public star party on Saturday night, August 12
- Camping availability for tent and RV campers from August 11 to 12
- Exhibits by major telescope and accessory vendors
- Lectures by astronomers
- Electronically assisted viewing of the sun and night sky
- Food and beverage vendors
- Astronomy games and crafts for kids
- Raffle for donated astronomy equipment on Saturday
- Optional behind the scenes tour of the Mount Laguna Observatory on Saturday, available to a limited number of visitors
- Julian StarFest is operated by a volunteer staff. Please contact the JSF Coordinator if you are interested in supporting this great SDAA event.

For more information, please contact <a href="mailto:info@julianstarfest.com">info@julianstarfest.com</a>



				-			
Date	Туре	Sunset	Astro. Twi.	Moonrise(set)	Closing	Illum. <sup>†</sup>	Hosts
5/13/2023	Public	7:39 PM	9:13 PM	3:03 AM	10:30 PM	38.5%	
5/20/2023	Member	7:43 PM	9:20 PM	(9:14 PM)	10:30 PM	1.6%	Jerry Hilburn
6/10/2023	Public	7:56 PM	9:37 PM	1:36 AM	11:00 PM	52.8%	
6/17/2023	Member	7:58 PM	9:40 PM	8:03 PM	11:00 PM	0.3%	
7/8/2023	Public	7:59 PM	9:39 PM	12:07 AM	11:00 PM	67.3%	Per Martin
7/15/2023	Member	7:57 PM	9:35 PM	4:36 AM	11:00 PM	3.9%	Igor von Nyssen
8/12/2023	Public	7:36 pm	9:06 PM	3:26 AM	11:00 PM	12.2%	Ed Rumsey
8/19/2023	Member	7:29 PM	8:57 PM	(9:23 PM)	10:30 PM	10.9%	
9/9/2023	Public	7:02 PM	8:26 PM	2:17 AM	10:00 PM	24.5%	Joe Fox (need a trainer)
9/16/2023	Member	6:53 PM	8:16 PM	(7:52 PM)	10:00 PM	3.0%	
10/7/2023	Public	6:25 PM	7:47 PM	1:07 AM	9:30 PM	40.2%	Paul Krizak
10/14/2023	Member	6:16 PM	7:38 PM	(6:22 PM)	9:30 PM	0.0%	Igor von Nyssen
11/4/2023	Public	5:55 PM	7:18 PM	11:54 PM	9:00 PM	57.8%	
11/11/2023	Member	4:49 PM	6:14 PM	5:34 AM	8:00 PM	2.8%	
12/9/2023	Member	4:42 PM	6:10 PM	4:22 AM	8:00 PM	12.0%	
12/16/2023	Public	4:44 PM	6:12 PM	(8:54 PM)	8:00 PM	20.1%	

### 2023 TDS Star Party Schedule

Illumination at meridian crossing.

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.