

# The Eyepiece



SW FL Astronomical Society, Inc.  
PO Box 100127  
Cape Coral FL 33910



Hi Everyone!  
We hope all of you have survived the tornadoes, cold weather

and clouds.

We have a fun meeting planned for February. Well traveled member Joe Dermody will present a short (20 minute) photo and video report about his recent trip to Antarctica for the December 4th total solar eclipse followed by a 40 minute multimedia presentation about Meteors (more info on page 3).

We have some cool outreach events coming up.

## NOT TO MISS:

- Seahawk Park star parties: 1/29/22 & 3/26/2022
- Moore Observatory First Fridays Feb 4th Contact Tom Segur
- Edison Day of Discovery/STEM-tastic on Feb 12th
- Burrowing Owl Festival Sat.

2/26/22.

If you are interested in helping at any of the events please contact Brian so that you can get details about the event. Most require us to be setup prior to their posted start times and limit vehicle traffic after a certain time. Please contact Brian at: swfaspres@gmail.com. MUCH more info in Brian's President's resport on page 4.

If you're in to Astrophotography, we have our monthly meeting on February 15th at 6:30pm. At that meeting I'm planning on a presentation on the ASI AIR unit and system, plus follow ups on APP. Usually plenty of other topics come up. Don't be shy if you're a newbie, we all were at one point, and I was just last year. We're all still learning (tip, point up for the stars). More on Astrophotography on page 5.

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## Monthly Meetings

Our monthly meetings are held on the **first Thursday** of each month. The meetings begin at 7:30pm.

*This month's meeting will be a combined live and Zoom meeting! Masks should be worn if attending in person at the Calusa Planetarium.*

*Joe Dermody has arranged to show a special Meteor talk that he filmed.*

FEBRUARY 2022						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	✓ <b>New Moon</b> ✓	1	2	<b>General Meeting</b> 7:30 pm	✓ <b>Observatory Viewing</b>	3 4 5
6	7	8	9	10	11	✓ 12 <b>Edison Day Outreach</b>
13	14	<b>Astro SIG</b> 6:30 pm	15	✓ <b>Full Moon</b>	16	17 18 19 ✓ <b>Solar Observing</b>
20	21	22	23	24	25	✓ 26 <b>Burrowing Owl Festival</b>
27	28					

## Moore Observatory Dates

Observation sessions typically begin about 30-45 minutes after it is dark enough to see the stars and continue as long as stargazers linger. Prior to complete darkness, visitors can not be admitted into the observatory as the equipment needs to be setup and aligned with the stars each time but early arrivers are welcome to enjoy views of the lake and the scenery of the campus from the lakeside picnic tables.

The public sessions are free and held at least once monthly from September through May, weather permitting.

Feb 4, 2022  
Mar 4, 2022  
Apr 1, 2022  
May 6, 2022

Also, the club conducts solar observing on the 3rd Saturday morning of each month. Contact for all observing events is:

Thomas Segur  
[tsegur479@comcast.net](mailto:tsegur479@comcast.net)  
941-249-8726

Each meeting will have its own link/meeting ID (see below).

So, mark your calendar for:

Feb. 3rd, 2022

How to use Zoom.

1. Download the software for smartphone, tablet or computer  
Click the link sent out for the meeting. Here's the link for our meeting  
[Join the Zoom Meeting at:  
https://widener.zoom.us/j/96373045138](https://widener.zoom.us/j/96373045138)

Meeting ID: 963 7304 5138

One tap mobile:

+16465588656,,96373045138# (or)  
+13017158592,,96373045138#

2. Click on window that appears, "Join Zoom Meeting".  
3. Then "Join Computer Audio"  
4. On entering the meeting, audio is going to be "off" by default. Press down and hold your space bar to talk. Both Brian and the presenter will be unmuted by default. This is being done to cut down on background noise, as it seems to accumulate as our numbers increase.



## February Program: *Meteors*

At the February 3rd meeting, SWFAS member Joe Dermody will present a short (20 minute) photo and video report about his recent trip to Antarctica for the December 4th total solar eclipse. Although the eclipse was obscured by clouds, Joe's presentation includes spectacular scenery, preparations for the eclipse, the eclipse (as experienced), along with star parties onboard the ship, while camping in Antarctica and in the Falkland Islands. Following that, Joe will show a 40 minute recording he made of astronomer Bob King's professional presentation about Meteors and related phenomena. Bob King has a monthly column "Explore the Night with Bob King" in Sky & Telescope magazine and also offers an interesting blog at: [astrobob1.blogspot.com](http://astrobob1.blogspot.com)

It's about a 40 minute presentation that we'll present from the planetarium and on Zoom.

Robert (Bob) P. King (known professionally as AstroBob), is an American photographer, writer, and an amateur astronomer. He publishes an astronomy blog called Astro Bob which is "widely read and respected". King started his Astro Bob blog in 2008 to share knowledge on astronomy events and discoveries from NASA.

His articles have also been published online with Sky & Telescope and Universe Today. He published his first book *Night Sky With the Naked Eye* in 2016. Emily Lakdawalla of The Planetary Society says the book contains "practical advice on photographing sky phenomena". His second book was reviewed in Astronomy Now.

### "Meteors" by Sky & Telescope columnist Bob King ("Explore the Night Sky") aka "Astro Bob"



## President's Report

### Brian Risley - SWFAS President

Again, we have a fun meeting planned for February. Joe Dermody will present a short photo and video report about his recent trip to Antarctica for the solar eclipse followed by a presentation about Meteors (more info on page 3).

We need all hands on deck helping with some outreach events coming up.

#### NOT TO MISS:

- **Seahawk Park star parties: 1/29/2022, 3/26/2022, 4/9/2022, 4/30/2022, 5/21/2022.**
- **Moore Observatory First Fridays Feb 4th Contact Tom Segur**
- **Edison Day of Discovery/STEMtastic on Feb 12th**
- **Burrowing Owl Festival Sat. 2/26/22.**
- **We have the Rotary Park Star Party on Friday 3/4/2022.**

**We are now scheduled for a display at Edison Day of Discovery/STEMtastic on Feb 12th 10am -2pm. We will need help manning scopes and the booth.**

Please contact me so that you can get details about the event and sign up to help. Most require us to be setup prior to their posted start times and limit vehicle traffic after a certain time.  
Contact me at: [swfaspres@gmail.com](mailto:swfaspres@gmail.com).

### 2022 Dues

If you have not sent in your check for your 2022 dues, please do so upon reading this announcement.

**Dues are an affordable \$25.**

Make check out to:  
Southwest Florida  
Astronomical Society  
PO Box 100127  
Cape Coral, FL 33910

## Star Parties

These are the dates for the Saturday Night star parties:

1/29/2022, 3/26/2022, 4/9/2022,  
4/30/2022, 5/21/2022.

For 1/29, we may have a NP rep there taking pictures for a March Article. We can possibly expect more public out there for the March and April events.  
Rotary Park Star Party on Friday 3/4/2022.

- Burrowing Owl Festival Sat. Feb. 26th
- We arrive around sunset. Some objects may be visible before it gets dark.

We are now scheduled for a display at Edison Day of Discovery/STEMtastic on Feb 12th 10am -2pm. We will need help manning scopes and the booth.

## Club Officers & Positions

President/Equipment  
Brian Risley  
[swfaspres@gmail.com](mailto:swfaspres@gmail.com)  
239-464-0366

Vice President/Programs  
Mike McCauley  
[mmccauley13@comcast.net](mailto:mmccauley13@comcast.net)  
860-982-5022

Secretary  
Don Palmer  
[swfas.sec@gmail.com](mailto:swfas.sec@gmail.com)  
239-334-3471

Treasurer/AL Coordinator  
John MacLean  
[john.maclean@comcast.net](mailto:john.maclean@comcast.net)  
239-707-3365

Charlotte Event Coordinators  
Tony Heiner  
[verahei@aol.com](mailto:verahei@aol.com)  
941-457-9700

Thomas Segur  
[tsegur479@comcast.net](mailto:tsegur479@comcast.net)  
941-249-8726

Viewing Coordinator  
Chuck Pavlick  
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239-560-1516

Newsletter/Website  
Mike Jensen  
[info@jensenone.com](mailto:info@jensenone.com)  
913-304-0495

FSW Punta Gorda Moore Observatory  
Director Thomas Segur  
[tsegur479@comcast.net](mailto:tsegur479@comcast.net)  
941-249-8726

Club Librarian  
Maria Berni  
239-940-2935

Club Historian  
Danny Secary  
[asecary@gmail.com](mailto:asecary@gmail.com)  
239-470-4764

Calusa Nature Center Planetarium Direc-  
tor Heather Preston  
[heather@calusanature.org](mailto:heather@calusanature.org)  
239-275-3435



## *Astrophotography (SIG)*

### *Special Interest Group*

Join Our New Astrophotography Special Interest Group (SIG) – Mike Jensen, Group Lead

#### **REGULAR MEETINGS**

**Regular meetings have been set for the 3rd Tuesday of each month at 6:30 on Zoom. The next meeting is Tuesday February 15th at 6:30.**

<https://us02web.zoom.us/j/81077794455?pwd=MHJVL2VvZGZRK3JyM1d5QVJiZE-1TUT09>

Meeting ID: 810 7779 4455  
Passcode: Phot@SIG



I thought I'd provide a little update on our Astro SIG group. We've been meeting for 6 months now. We have 22 on our email list and it grows by about 4-5 each month. I get at least a couple of inquiries through the website each week.

**I REALLY** want to encourage those who are just getting in to the hobby to get to our monthly meeting, reach out on our email list or shoot me a note to include a specific topic on the agenda. I want to share some about my own progress in this hobby. I've been shooting

The cool thing I'm really liking about the group is the sharing of info, helping and teaching each other. And the "pop up" meetings.

We have members of ALL skill levels and that's what makes it so great! Almost all of us started with a DSLR and a long lens. Some started as astronomy observers who decided to photograph what they were looking at.

wide field DSLR stars for years. Milky Way, star trails, that kind of thing. In Oct. 2020 I got an SA tracker for my birthday and started taking longer exposures. Then I joined this group in November and got to know people like Linwood, Ray and Don. I picked their brains on what I should be doing. Yes there were MANY emails and many opinions. There still are! We started this group in August and pulled in a few more people who were really in to this and a few more who were really curious. So, here we are.

Sometimes we ask ourselves ***why we got in to such a complex and difficult hobby***. For me, it's simple, I LOVE seeing the wonders of the night sky, and because I'm a photographer, I LOVE recording it and turning it in to art. To make those images we fret and fret about the weather, we lug pretty heave gear to mosquito infested dark sky areas and then we have fun! We watch the night sky! I can't think of a much better way to spend an evening! If you're interested, I hope you'll join us! Feel free to contact me at 913-304-0495 or [info@jensenone.com](mailto:info@jensenone.com).

Here's some images on our Target of the Month - The Orion Nebula. Here's Don Bishop's setup (upper right).



## M42 The Orion Nebula by Don Bishop





## *Astro SIG Target of the Month*

### **The Great Orion Nebula - M42**

**by Mike Jensen**

Here's a couple of images of M42, the The Great Orion Nebula. For those new to Astrophotography, the shot on the right was taken in March 2021 from Big Cypress. I used a Sony A7Riii on a Star Adventurer sky tracker. The image below was taken after I upgraded my gear (8 month wait for gear on a container ship). During the 8 months, I studied and talked to the members of our club.



This was one of the tougher images to take. Originally I started taking 30 second images. The Orion Nebula is one of the closest (and brightest) to our solar system. The key here is to shoot the nebula without “blowing out/overexposing” the core.

So, this is a composite image. 130 x 30 second images of L, R, G, B, & Ha combined with 100 x 10 second images of the same channels. The images are then placed over each other and the core is masked out of the longer exposed image.

Image taken on a Sky Watcher EQ6-R Pro GoTo mount, Williams Optic 61 with ZWO ASI 1600mm, driven by ASIAIR Plus.

## *Astro SIG Target of the Month*





## The Cone Nebula by Linwood Ferguson (S. Part of NGC 2264)

This was a difficult target to process, I had trouble finding a color pallet I liked, and not even sure this is it (it is in SHO version of ForaxX's approach).

I imaged this over about a week between Christmas and New Years. I tried adding back in RGB stars without luck, so settled for letting PCC do some correction, then tweaking them in post a few times.

While I did not get many colors, it did preserve the texture nicely. This represents 168 x 300s of Ha, 142 x 300s of Sii, and 133 x 300s of Oiii. The Oiii did not provide much detail. That's a total of about 37 hours. I got LRGB also but discarded it as not terribly helpful.



### ***February's Target of the Month The Rosette Nebula***

The Rosette Nebula (also known as Caldwell 49) is an H II region located near one end of a giant molecular cloud in the Monoceros region of the Milky Way Galaxy. The open cluster NGC 2244 (Caldwell 50) is closely associated with the nebulosity, the stars of the cluster having been formed from the nebula's matter.

The cluster and nebula lie at a distance of 5,000 light-years from Earth<sup>[3]</sup> and measure roughly 130 light years in diameter. The radiation from the young stars excites the atoms in the nebula, causing them to emit radiation themselves producing the emission nebula we see.

## The Horsehead & Flame Nebulas - IC 434 by Mike Jensen

This was shot the last week of the year. The images are 300 seconds each, about 21 per channel (L, R, G, B, Ha) for a total of 8.75 hours of imaging integration time. It was processed in APP (Astro Pixel Processor) and then finished in Photoshop and Topaz Denoise.



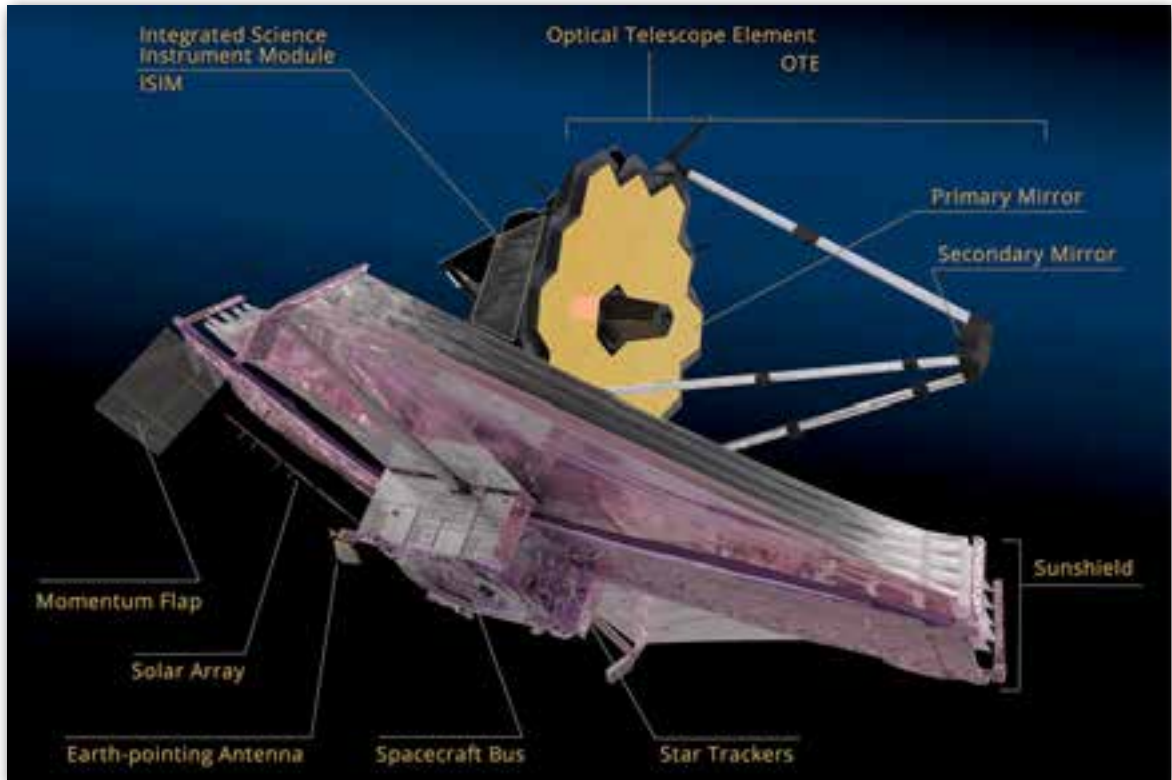


## Webb Gets Closer To Taking Images Next Step: Mirror Alignment

Compiled by Mike Jensen from news sources.

Thirty days outbound from Earth, the James Webb Space Telescope will slip into its parking orbit nearly a million miles away, an ideal spot to scan the heavens in search of faint infrared light from the first generation of stars and galaxies.

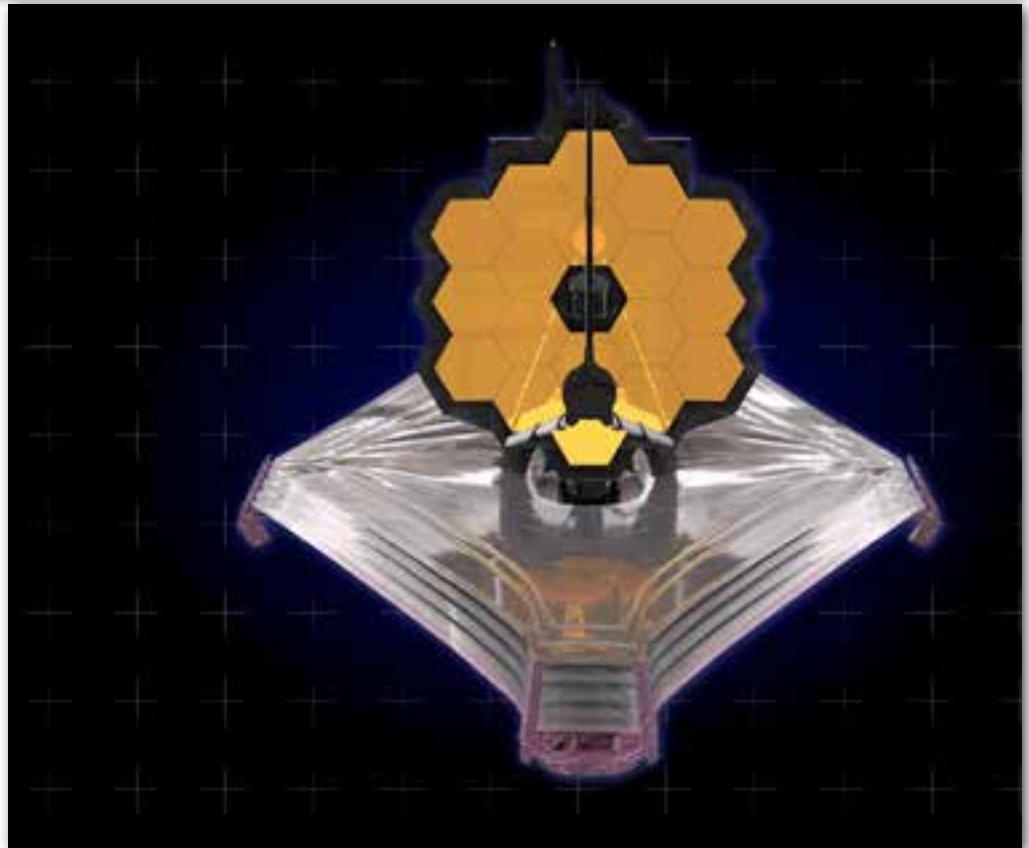
But getting there — and successfully deploying a giant sunshade, mirrors and other appendages along the way — was just half the fun.



Scientists and engineers now have to turn the \$10 billion Webb into a functioning telescope, precisely aligning its 18 primary mirror segments so they work together as a single 21.3-foot-wide mirror, by far the largest ever launched.

Engineers remotely completed a multi-day process to raise each segment, and the telescope's 2.4-foot-wide secondary mirror, a half-inch out of the launch locks that held them firmly in place during the observatory's Christmas Day climb to space atop a European Ariane 5 rocket.

Now fully deployed, the 18 segments currently are aligned to within about a millimeter or so. For the telescope to achieve a razor-sharp focus, that alignment must be fine-tuned to within 1/10,000th of the width of a human hair using multiple actuators to tilt and even change a segment's shape if required.



“Our primary mirror is segmented, and those segments need to be aligned to a fraction of a wavelength of light,” said Lee Feinberg,

optical telescope element manager at NASA's Goddard Space Flight Center. “We're not talking microns, we're talking a fraction of a wave-

length. That's what's tricky about Webb."

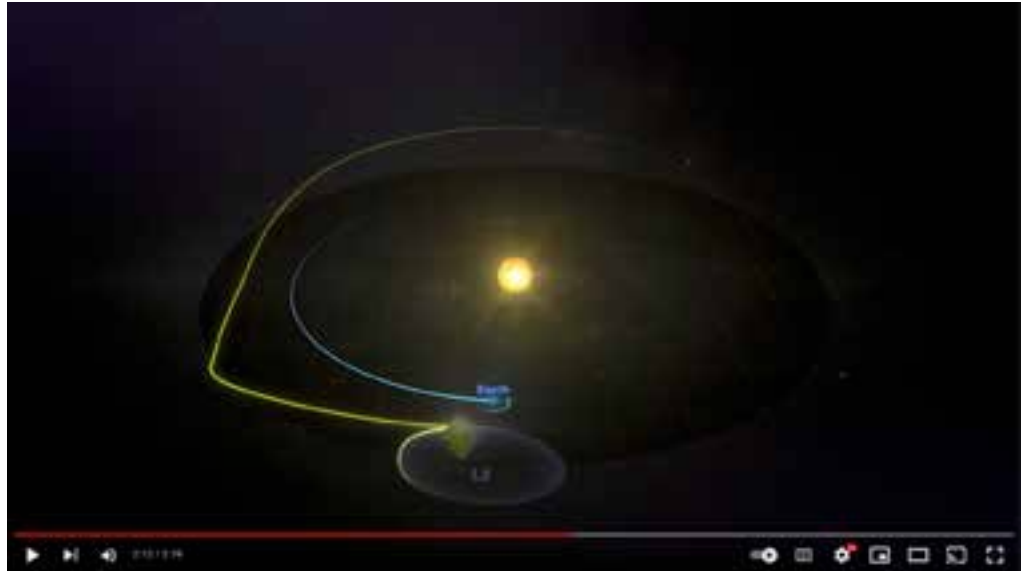
### ***Powerful enough to detect the heat of a bumble bee as far away as the moon***

Once aligned and its instruments calibrated, Webb will be 100 times more powerful than Hubble, NASA says — so sensitive to infrared light that it could detect the faint heat of a bumble bee as far away as the moon.

Each mirror segment was ground to a prescription that takes into account the deforming effects of gravity on Earth and their expected shrinkage in the ultra-low-temperatures of space. They were so precisely figured that if one was blown up to the size of the United States, the 14,000-foot-high Rocky Mountains would be less than 2 inches tall.

But If Webb was aimed at a bright star today, the result would be 18 separate images "and they're going to look terrible, they're going to be very blurry," Feinberg said in an interview, "because the primary mirror segments aren't aligned yet." That's the next major hurdle for the Webb team, mapping out and then tilting each segment in tiny increments, merging those 18 images to form a single exactly focused point of light. It's an iterative, multi-step process expected to take several months to complete.

But first, the telescope must get into orbit around Lagrange Point 2, 930,000 miles from Earth where the gravity of sun and Earth combine to form a pocket of stability that allows spacecraft to remain in place with a minimum expenditure of fuel.



Animation: The James Webb Space Telescope's Orbit

It's also a point where Webb's sunshade, the size of a tennis court, can work to maximum advantage, blocking out heat from the sun, Earth, moon and even warm interplanetary dust that otherwise would swamp the telescope's sensitive infrared detectors.

As of Saturday, the mirror segments had cooled down to around minus 340 Fahrenheit, well on the way to an operational temperature of around minus 390, or less than 40 degrees above absolute zero.

### ***Getting ready to capture "wow" images***

With the orbit insertion burn behind them, engineers will press ahead with mirror alignment, one of the most complex aspects of Webb's already complicated deployment.

Each 4.3-foot-wide hexagonal primary mirror segment features six mechanical actuators in a "hexapod" arrangement on the back side, allowing movement in six directions. A seventh actuator can push or pull on the center of a segment to ever so slightly distort



its curvature if needed. After Webb's Near Infrared Camera, or NIRCam, cools down to its operating temperature, Webb will be aimed at a bright star so the instrument can map out the reflections from all 18 segments, creating a mosaic showing their relative size and position.

The mirror segments then will be adjusted one at a time, using one actuator then another, to properly aim each one. Additional mosaics will be made as the process continues and depending on the results, the alignment process may have to be repeated.



## *The Astronomical League*

As a member of the Southwest Florida Astronomical Society you are automatically also a member of the Astronomical League, a nationwide affiliation of astronomy clubs. Membership in the AL provides a number of benefits for you including receipt of The Reflector, the AL's quarterly newsletter, use of the Book Service, through which you can buy astronomy related books at a 10% discount. You can also participate in the Astronomical League's Observing Clubs. The Observing Clubs offer encouragement and certificates of accomplishment for demonstrating observing skills with a variety of instruments and objects. These include the Messier Club, Binocular Messier Club, the Herschel 400 Club, the Deep Sky Binocular Club, and many others. To learn more about the Astronomical League and its benefits for you, visit <http://www.astroleague.org>



### **Reflector Magazine**

You should have received an email from the Astronomical League linking to your digital copy of the December 2021 Quarterly Reflector magazine on around December 6, You can also directly access copies via the web at <https://www.astroleague.org/reflector>

### **Monthly highlight of the Astronomical League Observing Programs Advanced and Specialized Astronomical League Observing Programs**

This month we will summarize five of the most advanced deep-sky programs available along with the variable star observing program.

**Active Galactic Nuclei Observing Program** This requires the observation or imaging of a minimum of 30 Active Galactic Nuclei (AGNs) including Quasars, BL Lacertae Objects (BLOs), and Seyfert Galaxies. A 13 – 15 inch instrument is required for visual observers but a 4 inch will suffice for imaging.

**ARP Peculiar Galaxies Observing Program** This program is based on the 338 objects found in the Arp catalog named after Halton C. Arp. Observation of a minimum of 100 objects is required and the minimum suggested instrument size is 12.5 inches.

**Dark Nebulae Observing Program** These are amongst the most difficult deep-sky objects to find. A range of telescopes is required to optimally find and observe them ranging from 4 – 6 inch rich field instruments to 8 inch scopes for the fainter objects. A total of 70 dark nebulae are required for program completion.

**Flat Galaxies Observing Program** Minimum instrument size is 15 inches and observation of 50 flat galaxies is required.

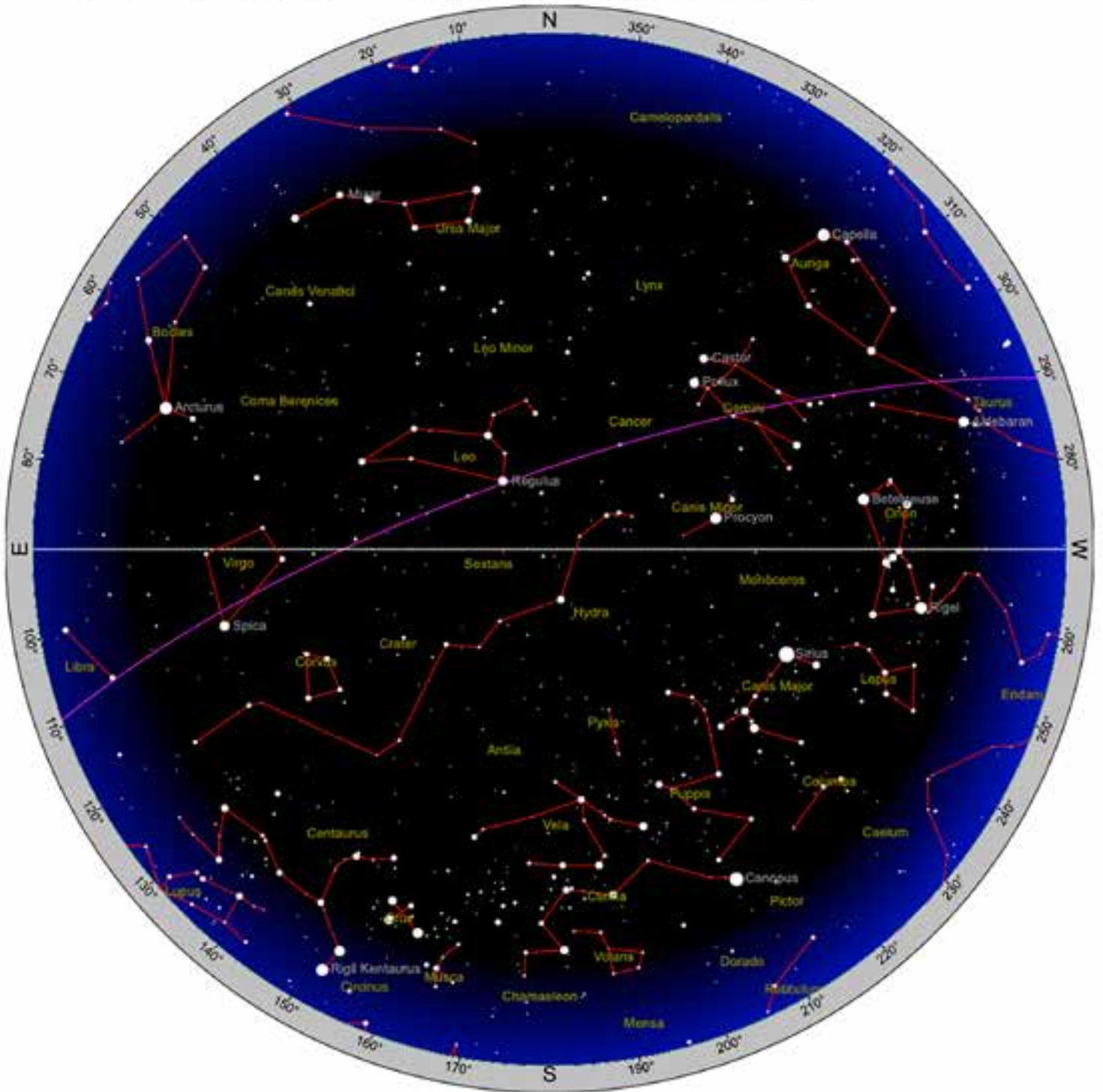
**Local Galaxy Group and Neighborhood Observing Program** The Local Group is dominated by three spiral galaxies, Andromeda, the Milky Way, and M33. However there are a host of dimmer, lesser galaxies involved. A total of 88 objects are required to be observed for the award.

**Variable Star Observing Program** This program is coordinated with AAVSO. Observation of 100 variable stars is required and a complete cycle of a long period variable must be documented. This program does not require large aperture instruments and is appropriate even for beginning observers.

# Star Chart

## Interactive sky chart

Year  Month  Day  -  Hour  -  Minute  -





## Planet Positions

Click on the graphic above to go to Time and Date for a great simulation of the rotation of the constellations and the rising/setting of the planets. The chart below is set for Sept. 1st but can be programmed for any date and time. The chart can also be found at [this link on Heavens Above](#).

### Planet Summary

Year  Month  Day  Time

	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Right ascension	19 <sup>h</sup> 45 <sup>m</sup> 40.4 <sup>s</sup>	18 <sup>h</sup> 51 <sup>m</sup> 46.4 <sup>s</sup>	18 <sup>h</sup> 44 <sup>m</sup> 18.6 <sup>s</sup>	22 <sup>h</sup> 42 <sup>m</sup> 0.7 <sup>s</sup>	21 <sup>h</sup> 14 <sup>m</sup> 55.3 <sup>s</sup>	2 <sup>h</sup> 33 <sup>m</sup> 35.3 <sup>s</sup>	23 <sup>h</sup> 29 <sup>m</sup> 59.4 <sup>s</sup>	19 <sup>h</sup> 57 <sup>m</sup> 6.3 <sup>s</sup>
Declination	-19° 13' 21"	-16° 31' 52"	-23° 37' 15"	-9° 16' 50"	-16° 51' 9"	14° 39' 41"	-4° 27' 35"	-22° 31' 55"
Range (AU)	0.825	0.380	2.125	5.902	10.897	19.831	30.745	35.372
Elongation from Sun	24.0°	36.7°	38.6°	19.8°	2.9°	82.0°	32.6°	21.9°
Brightness	0.4	-4.5	1.4	-1.9	0.7	5.8	7.9	14.4
Equatorial Diameter	8.16"	43.96"	4.41"	33.40"	15.25"	3.55"	2.22"	0.09"
Phase Angle	100.8°	124.9°	24.4°	3.8°	0.3°	2.8°	1.0°	0.6°
Constellation	<a href="#">Sagittarius</a>	<a href="#">Sagittarius</a>	<a href="#">Sagittarius</a>	<a href="#">Aquarius</a>	<a href="#">Capricornus</a>	<a href="#">Aries</a>	<a href="#">Aquarius</a>	<a href="#">Sagittarius</a>
Meridian transit	10:35	09:41	09:33	13:31	12:04	17:22	14:19	10:47
Rises	04:35	03:42	03:33	07:32	06:05	11:23	08:20	04:48
Sets	16:34	15:40	15:33	19:30	18:04	23:21	20:18	16:46
Altitude	-51.6°	-63.9°	-60.3°	-11.8°	-32.1°	44.0°	0.0°	-47.7°
Azimuth	238.0°	229.6°	216.1°	260.5°	250.0°	290.6°	265.5°	235.3°
Inferior Conjunction	2022-Jan-23 2022-May-21	2022-Jan-09 2023-Aug-13	-	-	-	-	-	-
Opposition	-	-	2020-Oct-13 2022-Dec-08	2021-Aug-20 2022-Sep-26	2021-Aug-02 2022-Aug-14	2021-Nov-04 2022-Nov-09	2021-Sep-14 2022-Sep-16	2021-Jul-17 2022-Jul-20
Superior Conjunction	2021-Nov-29 2022-Apr-02	2021-Mar-26 2022-Oct-22	2021-Oct-08 2023-Nov-18	2021-Jan-29 2022-Mar-05	2022-Feb-04 2023-Feb-16	2021-Apr-30 2022-May-05	2021-Mar-11 2022-Mar-13	2022-Jan-16 2023-Jan-18
Max. eastern elongation	2022-Jan-07 2022-Apr-29	2021-Oct-29 2023-Jun-04	-	-	-	-	-	-
Max. western elongation	2021-Oct-25 2022-Feb-16	2020-Aug-13 2022-Mar-20	-	-	-	-	-	-
Perihelion	2022-Jan-15 2022-Apr-13	2022-Jan-23 2022-Sep-04	2020-Aug-03 2022-Jun-21	2011-Mar-17 2023-Jan-20	2003-Jul-26 2032-Nov-28	1966-May-22 2050-Aug-17	1876-Aug-26 2042-Sep-03	1989-Sep-05 2237-Sep-15
Aphelion	2021-Dec-02 2022-Feb-28	2021-Oct-03 2022-May-15	2021-Jul-13 2023-May-30	2017-Feb-17 2028-Dec-28	2018-Apr-17 2047-Jul-15	2009-Feb-27 2092-Nov-23	1959-Jul-17 2125-Dec-01	1866-Jun-04 2114-Feb-19

## The Night Sky Network



This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!

### Hang Out with the Twins of Gemini David Prosper

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

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

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

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



*Montage of Gemini North, located on Mauna Kea in Hawaii, and Gemini South, located on Cerro Pachón in Chile. These "twin" telescopes work together as the Gemini Observatory to observe the entire sky. Image Credit: NOIRLab Source: <https://www.gemini.edu/gallery/media/gemini-northsouth-montage>*



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

Image created with assistance from Stellarium.



## Orion Star Tracker For Sale

This is a perfect condition star tracker by Orion. Called "Star, shoot, cat". It was bought and only used it twice because my scope was slightly to big and I had a bad reducer corrector, but did not know that was where my problem was. So now I have a big mount and need a guide set up for it. All together with the Skywatcher latitude base and extra Dec bracket and counter weight I paid close to \$500 with ball head. I am selling it all for \$325 obo. I would also trade for a mini guide scope and camera for my set up. A 120mm 1.2mp zwo. On a 50-30mm scope. Or preferably a asi air plus or pro instead. Polar alignment scope rotates to where you want it. Everything works 100% and has no scratches or anything. Holds 6.6 pounds without bracket and counter weight. But holds 8.8 pounds with it. Check out this tracker online at Orion for more info on it please.

Gary Joe Swaney

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