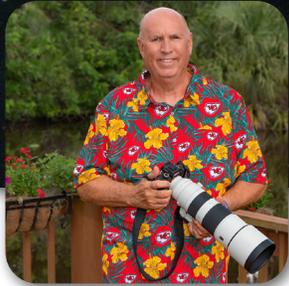




The Eyepiece

SW FL Astronomical Society, Inc.
3236 Forum Blvd #1160
Fort Myers, FL 33905



Editor - Mike Jensen

Hi Everyone!
Much going on for September as we gear up another year.

First, the new bylaws have passed. Thanks to John MacLean emailing, calling and nudging people to vote, we have passed the new bylaws which will make it easier to run our club.

Next, the dates for the new season of observing stars, planets, the sun, the moon and much more have been announced. See page 5.

If you didn't know it, we have a solar eclipse next month on Oct. 14th. Annular means "Ring

Shaped". The name "annular" comes from the Latin word for ring, "annulus." NOT annual! More on this in the newsletter next month.

There's a lot to read and gaze at in this month's issue. Despite the abundance of clouds, our amazing astrophotographer team has submitted some amazing astrophotographs, including some cool images from member Ray Gregory who images remotely.

Finally, on page 24 I've written a short article on shooting the Milky Way. I took a trip to the dark skies of Utah in August and came away with not only amazing images, but plans to return!

Thanks!
Mike

Deer Lick Group and Stephan's Quintet by Scott Cruzen

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Take The Member's Survey
We have created a member survey to gain your feedback on a variety of things important to the club. Please take a few minutes to complete it.

[Click Here](#)

**Observing/Star Party
Dates Announced**
Info on page 5.

Club Officers & Positions

President/Equipment
Brian Risley
swfaspres@gmail.com
239-464-0366

Vice President/
Newsletter/Website/Astro SIG
Mike Jensen
info@jensenone.com
913-304-0495

Secretary
Dan Dannenhauer
gawomp@aol.com
239-850-7111

Treasurer/AL Coordinator
John MacLean
john.maclean@comcast.net
239-707-3365

Charlotte Event Coordinators
Tony Heiner
verahei@aol.com
941-457-9700

Thomas Segur
tsegur479@comcast.net
941-249-8726

Big Cypress Viewing Coordinator
Mike Jensen
info@jensenone.com
913-304-0495

FSW Punta Gorda Moore Observatory
Director Thomas Segur
tsegur479@comcast.net
941-249-8726

Club Librarian
Maria Berni
239-940-2935

Club Historian
Danny Secary
asecary@gmail.com
239-470-4764

Calusa Nature Center Planetarium Direc-
tor Heather Preston
heather@calusanature.org
239-275-3435

Monthly Meetings

Our monthly meetings are held on the **first Thursday of each month.**
The meetings begin at 7:00pm.

Each meeting is usually a combined live and Zoom meeting.

The in person meeting is held at:
Calusa Nature Center/Planetarium
3450 Ortiz Ave,
Fort Myers, FL 33905

Each meeting will have the same
Zoom link/meeting ID.

Dear Members,

In order to improve the quality of the recording of our meeting presentations, our system of muting Zoom participants will change. During a presentation, Zoom depends on sound to identify the presenter. As a result, if a participant sneezes or coughs, or any outside noise happens, that person is presented as the speaker in the Zoom video. In order to prevent this from happening, all participants must be "muted". As the host, I will "mute all" during presentations. This will prevent any extraneous noise from interfering with the presentation and a singular video of the presenter will be produced. We see this as an excellent way to improve the quality of our recordings, however, there is a "downside". After the presentation, for the "Q & A", the participant(s) will have to alert the host (me) to "unmute" by raising your hand. I will then send you a request (permission) to "unmute" yourself. Technical note: If you mute yourself again after being "unmuted" you will have to alert the host again to unmute, since this format is locked for the Zoom session. Thanks for your understanding, as we try to improve the quality of our presentations.

Tom K

Below are the dates for the meet-
ings of 2023:

Sept. 7, 2023
Oct. 5, 2023
Nov. 2, 2023
Dec. 7, 2023 Annual Bus. Mtg

Link to join Zoom meeting:
<https://widener.zoom.us/j/98623448643>

Meeting ID: 986 2344 8643

One tap mobile:
+13052241968,,98623448643#
US (or)
+13126266799,,98623448643#
US



Bylaws Have Been Approved!

**Thanks to everyone for getting your vote in!
And thanks to John MacLean for his work in emailing and "nudging" a
few of you to get out and vote!**

President's Report

A lot has been going on. The Bylaws were passed. We are working on getting AV equipment to improve the presentations and Zoom meetings. I would like to thank all involved in getting these things done and to all of you who voted.

Now is the time for those of you interested in Outreach to step up. We have a lot of events happening, including two solar eclipses in the coming months.

FSW Friday Night observing starts September 8th. In October it is on the 13th.

We start up Seahawk Park Star Parties on September 16th with October's on the 14th.

Astronomical League's Astronomy Day is Sept 23rd, which coincides with Charlotte Solar Observing at Ponce de Leon Park.

International Astronomy Day is Oct 28th and that coincides with Charlotte Solar Observing at Bayshore Live Oak Park.

October 14th is the Annual Solar Eclipse. FSW is planning an event. Would like to hold something in the Fort Myers area if I can get some volunteers. Eclipse starts at 11:52 am and center time is 1:28pm with 60% coverage. It ends at 3:07 pm.

October 21st is International Observe the Moon Night. I would like to have an event for that.

John MacLean has another interesting speaker lined up for this month's meeting:

Dr. Julie D. Stopar, Senior Staff Scientist, Regional Planetary Facility

"Lunar geology, LRO, and Artemis Planning"

See you all at the meeting or on Zoom.

Brian Risley

GUEST SPEAKER PRESENTATIONS SERIES

We are excited to announce the initiation of the new "SWFAS Guest Speaker Presentations" series of talks. These will cover astronomical science and space exploration along with practical astronomy and astrophotography talks by various subject matter experts. We are lining up prominent scientists and researchers to explain the science and technology behind the exciting discoveries being made in recent years in astronomy.

The following presentations are already scheduled and we will be firming up talks in 2023 on a month-to-month basis.:

Sept. 7, 2023

Dr. Julie D. Stopar, Senior Staff Scientist,
Regional Planetary Facility

**Lunar geology, LRO, and
Artemis Planning**

Following her presentation there will be a screening of a Planetary show entitled "Lunar Exploration – The Future"

Oct. 5, 2023

Dr. Dave Coulter

Nov. 2, 2023

Dr. Matthew Greenhouse, Project Scientist
JWST - NASA Goddard Space Flight Center

Sept. 7, 2023



**Dr. Julie Stopar
Lunar Geology, LRO and
Artemis Planning
Senior Staff Scientist,
Lunar Planetary Institute**

The Astronomical League Report



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

The latest Sept. 2023 copy of the Reflector magazine is available via the web at <https://www.astroleague.org/reflector>

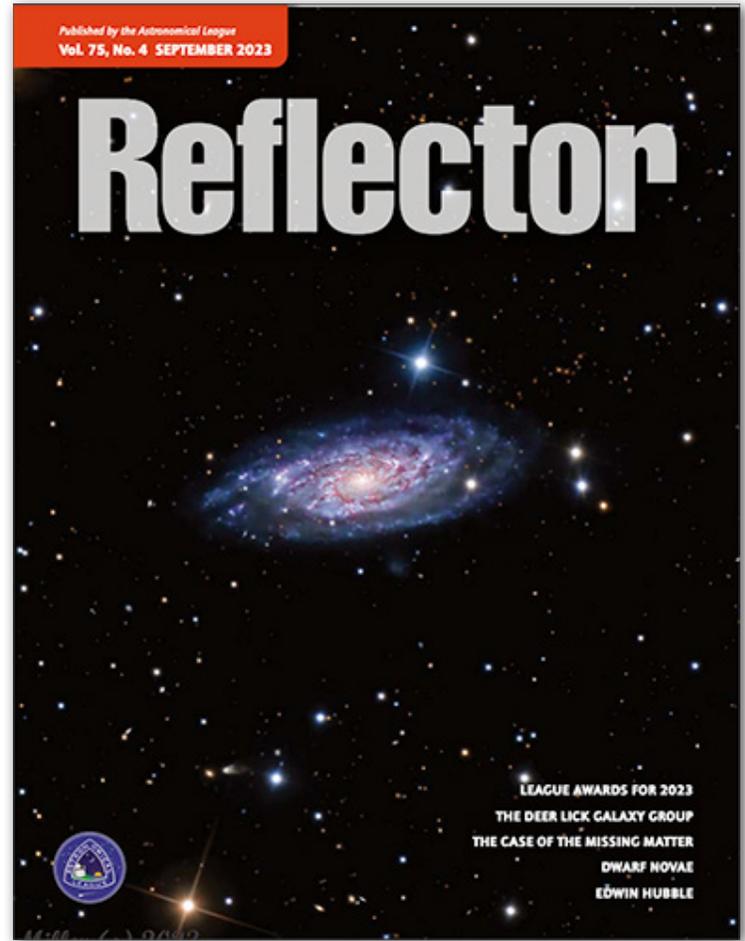
Monthly highlight of the Astronomical League Observing Programs

(Article prepared by SWFAS Astronomical League Coordinator John MacLean)

Last month we covered the Lunar Observing Programs. This month we'll cover the Messier Objects. The Astronomical League Messier Observing Programs. The Messier objects include some of the most familiar and spectacular deep sky targets for the amateur observer and the Astronomical League has developed both telescopic and binocular observing programs.

Messier Observing Program

This program requires the use of a telescope and there are two levels of awards. A certificate only is awarded for observing 70 objects and a certificate and pin are



awarded for observing all 110 objects – the honorary level.

The procedure is to select and observe 70 objects and turn in the properly filled out observing logs to an officer of the local Astronomical Society (i.e. SWFAS in our case.) The officer will then review and approve the logs and notify the Astronomical League that the observer has met the requirements for receiving the award. The observing logs must include the date and time of the observations, the Lat/Long coordinates for the observing sites, the seeing and transparency conditions, the aperture and magnification, and a description of the Messier object as it appears in the scope. For the honorary level, all 110 objects must be observed and the logs processed again by an officer of the local member club.

Since the purpose of the Messier observing program is to familiarize the observer with the nature and location of the objects in the sky, the use of automated telescopes is not allowed and this includes use of Go-To scopes and both manual and digital setting circles. Navigation must be by manual star-hopping via finder scopes and Telrads or equivalent.

A convenient Messier List is provided which breaks down the Messier objects by season: I. Winter, II. Early Spring, III. Late Spring, IV. Mid-Summer, V. Late-Summer, and VI. Fall and Early Winter.

Binocular Messier Program

This program requires the observation of any 50 of the 110 recognized Messier objects.

Two options are provided depending on binocular size.

Binoculars with 20 mm – 50 mm diameter lenses (e.g. 7 X 35, 7 X 50, 10 X 50)

- Objects are selected from Appendix A which lists 76 objects with
- 42 classified as Easy
- 18 classified as Tougher, and
- 16 classified as Challenge.
- To obtain the certificate, 50 objects including only 8 of the Tougher are required to be selected and observed.

Binoculars with 56 mm – 80 mm diameter lenses (e.g. 11 X 80)

- Objects are selected from Appendix B which lists 102 objects with
- 58 classified as Easy
- 23 classified as Tougher, and
- 21 classified as Challenge.

To obtain the certificate, all 50 objects may be selected out of the Easy category for observation.

The observing logs are sent directly to the Astronomical League to receive the award.

Messier Observing Resources. In addition to the online seasonal Messier object listing mentioned above, the AL also publishes “Messier Objects: A Beginner’s Guide” which is available via the online store for \$8.

Port Charlotte/Punta Gorda Observing Dates Announced

Night Sky Observing At Moore Observatory & Solar Observing In PG & PC

Our Observatory Team opens up the Moore Observatory at FSW Charlotte Campus (26000 Airport Road, Punta Gorda) on the second Friday of each month. 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 weather permitting.

Here is the schedule for 2023/24:

- Sep 8, 2023
- Oct 13, 2023
- Nov 10, 2023
- Dec 8, 2023
- Jan 12, 2024
- Feb 9, 2024
- Mar 8, 2024
- Apr 12, 2024
- May 10, 2024

Our observing team also sets up solar telescopes on the 4th Saturday of the month (from 9am - Noon) to look at the Sun, looking for solar flares, prominences and other solar phenomena. All events are in Port Charlotte or Punta Gorda.

Solar Observing/Park

Sep 23, 2023	Ponce deLeon
Oct 28, 2023	Bayshore Live Oak
Nov, 25, 2023	Gilchrist
Dec 23, 2023	Ponce deLeon
Jan 27, 2024	Bayshore Live Oak
Feb 24, 2024	Gilchrist
Mar 23, 2024	Ponce deLeon
Apr 27, 2024	Bayshore Live Oak
May 25, 2024	Gilchrist

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 to find local clubs, events, and more!



Looking Beyond the Stars Brian Kruse

Looking up in awe at the night sky, the stars and planets pop out as bright points against a dark background. All of the stars that we see are nearby, within our own Milky Way Galaxy. And while the amount of stars visible from a dark sky location seems immense, the actual number is measurable only in the thousands. But what lies between the stars and why can't we see it? Both the Hubble telescope and the James Webb Space Telescope (Webb) have revealed that what appears as a dark background, even in our backyard telescopes, is populated with as many galaxies as there are stars in the Milky Way.

So, why is the night sky dark and not blazing with the light of all those distant galaxies? Much like looking into a dense forest where every line of sight has a tree, every direction we look in the sky has billions of stars with no vacant spots. Many philosophers and astronomers have considered this paradox. However, it has taken the name of Heinrich Wilhelm Olbers, an early 19th century German astronomer. Basically, Olbers Paradox asks why the night sky is dark if the Universe is infinitely old and static – there should be stars everywhere. The observable phenomenon of a dark sky leads us directly into the debate about the very nature of the Universe – is it eternal and static, or is it dynamic and evolving?

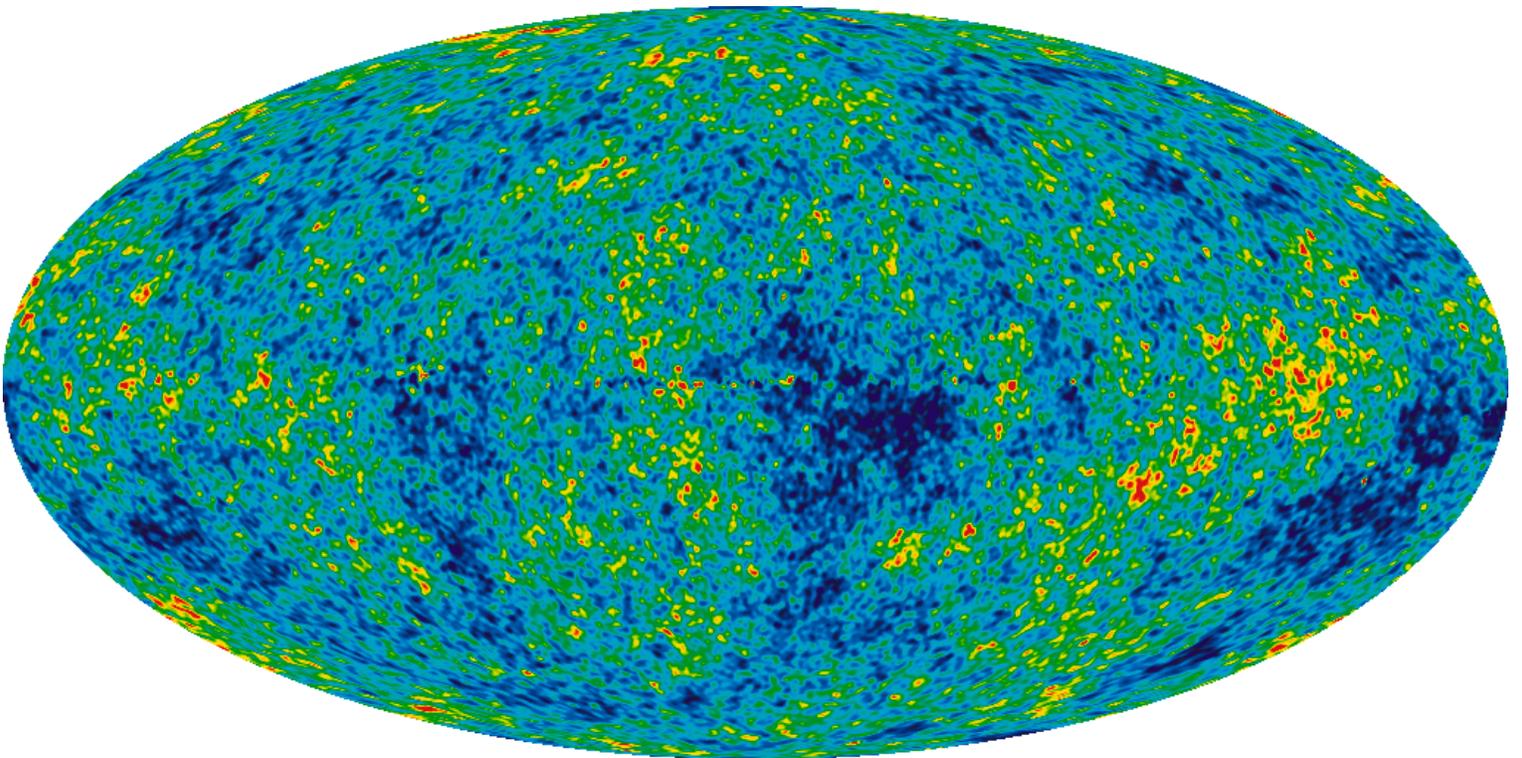
It was not until the 1960s with the discovery of the Cosmic Microwave Background that the debate was finally settled, though various lines of evidence for an evolving universe had built up over the previous half century. The equations of Einstein's General Theory of Relativity suggested a dynamic universe, not eternal and unchanging as previously thought. Edwin Hubble used the cosmic distance ladder discovered by Henrietta Swan Leavitt to show that distant galaxies are moving away from us – and the greater the distance, the faster they're moving away. Along with other evidence, this led to the recognition of an evolving Universe.

The paradox has since been resolved, now that we understand that the Universe has a finite age and size, with the speed of light having a definite value. Here's what's happening – due to the expansion of the Universe, the light from the oldest, most distant galaxies is shifted towards the longer wavelengths of the electromagnetic spectrum. So the farther an object is from us, the redder it appears. The Webb telescope is designed to detect light from distant objects in infrared light, beyond the visible spectrum. Other telescopes detect light at still longer wavelengths, where it is stretched into the radio and microwave portions of the spectrum. The farther back we look, the more things are shifted out of the visible, past the infrared, and all the way into the microwave wavelengths. If our eyes could see microwaves, we would behold a sky blazing with the light of the hot, young Universe – the Cosmic Microwave Background.

The next time you look up at the stars at night, turn your attention to the darkness between the stars, and ponder how you are seeing the result of a dynamic, evolving Universe.



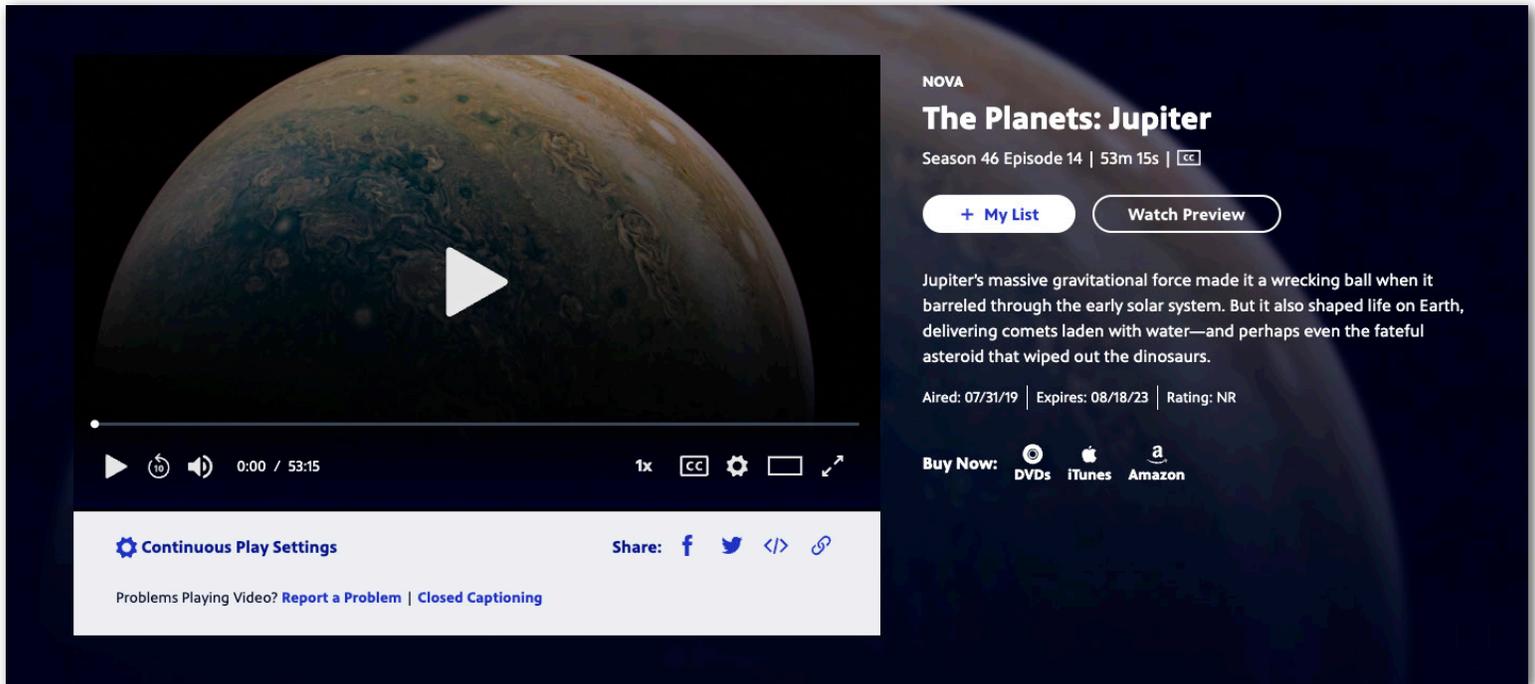
NASA's James Webb Space Telescope has produced the deepest and sharpest infrared image of the distant universe to date. Known as Webb's First Deep Field, this image of galaxy cluster SMACS 0723 is overflowing with detail. This slice of the vast universe is approximately the size of a grain of sand held at arm's length by someone on the ground. (Image Credit: NASA, ESA, CSA, STScI) <https://bit.ly/webbdeep>



The oldest light in the universe, called the cosmic microwave background, as observed by the Planck space telescope is shown in the oval sky map. An artist's concept of Planck is next to the map. The cosmic microwave background was imprinted on the sky when the universe was just 380,000 years old. It shows tiny temperature fluctuations that correspond to regions of slightly different densities, representing the seeds of all future structure: the stars and galaxies of today. (Image credit: ESA and the Planck Collaboration - D. Ducros) <https://go.nasa.gov/3qC4G5q>

Great Shows Our Members Recommend

Who doesn't love a great PBS documentary? This one recommended by John MacLean talks about the planets of our solar system and Jupiter in particular. Click on the image to watch. PBS membership may be required.



NOVA
The Planets: Jupiter
 Season 46 Episode 14 | 53m 15s | [CC](#)

[+ My List](#) [Watch Preview](#)

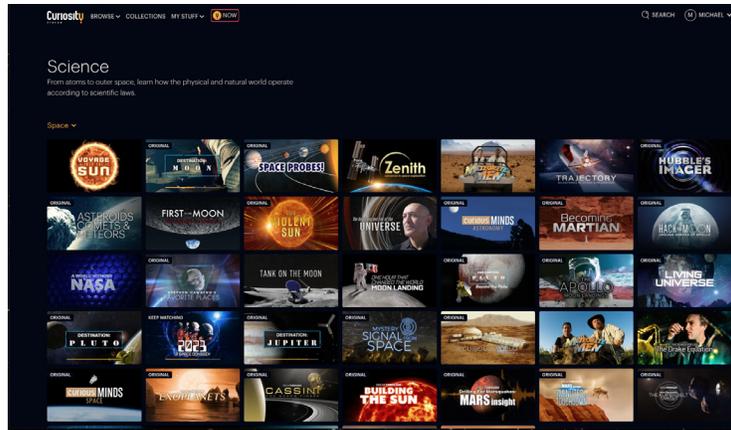
Jupiter's massive gravitational force made it a wrecking ball when it barreled through the early solar system. But it also shaped life on Earth, delivering comets laden with water—and perhaps even the fateful asteroid that wiped out the dinosaurs.

Aired: 07/31/19 | Expires: 08/18/23 | Rating: NR

Buy Now: [DVDs](#) [iTunes](#) [Amazon](#)

Continuous Play Settings [Share: f t </> ↻](#)

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Curiosity Stream - Recommended by Mike Jensen. I signed up for Curiosity (\$3.95/month) during my recovery from my most recent knee surgery. So affordable and great new content all the time!



UNKNOWN, Cosmic Time Machine - Recommended by Mike Jensen. This is a new documentary on Netflix. It's about the creation, building, launch and deployment of the James Webb Space Telescope. This is a great pic for astrophotographers!

ABOUT THE ASTRO SIG

Every month we get together on a Zoom call with a pretty loose agenda and manage to have an absolute blast talking about Astrophotography. I hope you'll join us if you're interested in Astrophotography.

IMAGING TRIPS TO BIG CYPRESS

Big Cypress National Park is about a 75 minute drive from Ft. Myers and it is probably one of the darkest areas in the state of Florida. We have a great place to set up and frequently meet astrophotographers and observers from other parts of the state.

The best way to stay tuned in to our impromptu field trips is to get on our Astro SIG Google Groups email list. [Contact Mike Jensen.](#)

Astro Sig Schedule 2023

All Meetings at 6:30pm

September 19th
October 17th
November 21st
December 19th

The Astrophotography SIG

Our Astro SIG group is really growing in strength. From a meeting perspective, we are small, but our email list is about 40 and of those about 10 consistently contribute images for use on our website and in the newsletter. I truly believe that some of our images are unequalled in quality.

Many of our group are out imaging almost every possible night and reporting the results on our email group.

I am especially proud at the way our group shares lessons learned and methods taken to get the best out of their gear and the best images. Please see our images beginning on the next page.

ASTRO SIG MEETING ZOOM LINK

<https://us02web.zoom.us/j/81077794455?pwd=eGpxalRET1BPckdEcmt-JQ290WU5jdz09>

Meeting ID: 810 7779 4455
Passcode: Phot@SIG23



The Dumbell Nebula by Ray Bratton

Astrophotography App Market to Witness the Highest Growth in Coming Years

From [DigitalJournal.com](https://www.digitaljournal.com)

The latest research study released by Worldwide Market Reports on “Astrophotography App Market 2023 Forecast to 2030” research provides accurate economic, global, and country-level predictions and analyses. It provides a comprehensive perspective of the competitive market as well as an in-depth supply chain analysis to assist businesses in identifying major changes in industry practices. The market report also examines the current state of the Astrophotography App industry, as well as predicted future growth, technological advancements, investment prospects, market economics, and financial data. This study does a thorough examination of the market and offers insights based on an industry SWOT analysis. The report on the Astrophotography App Market provides access to critical information such as market growth drivers, market growth restraints, current market trends, the market’s economic and financial structure, and other key market details.

Furthermore, The report provides a detailed understanding of the market segments which have been formed by combining different prospects such as types, applications, and regions. Apart from this, the key driving factors, restraints, potential growth opportunities, and market challenges are also discussed in the report.

The report further explores the key business players along with their in-depth profiling:

- Celestron’s SkyPortal
- SkyPortal
- PhotoPills
- SkySafari
- Light Pollution Map
- Heavens Below
- NightCap Camera
- Star Trails
- Dark Sky
- Stellarium
- ISS Detector
- Clear Outside
- The Photographer’s Ephemeris
- Nightshift
- AstroShader
- AstroCam
- Polar Scope Align Pro
- DeepSkyCamera
- Just a Compass
- ProCam X
- DarkLight
- Astrospheric
- StarSense Explorer
- Meteoblue
- SkyView Lite
- Star Walk
- Sky Tonight
- Polar Finder

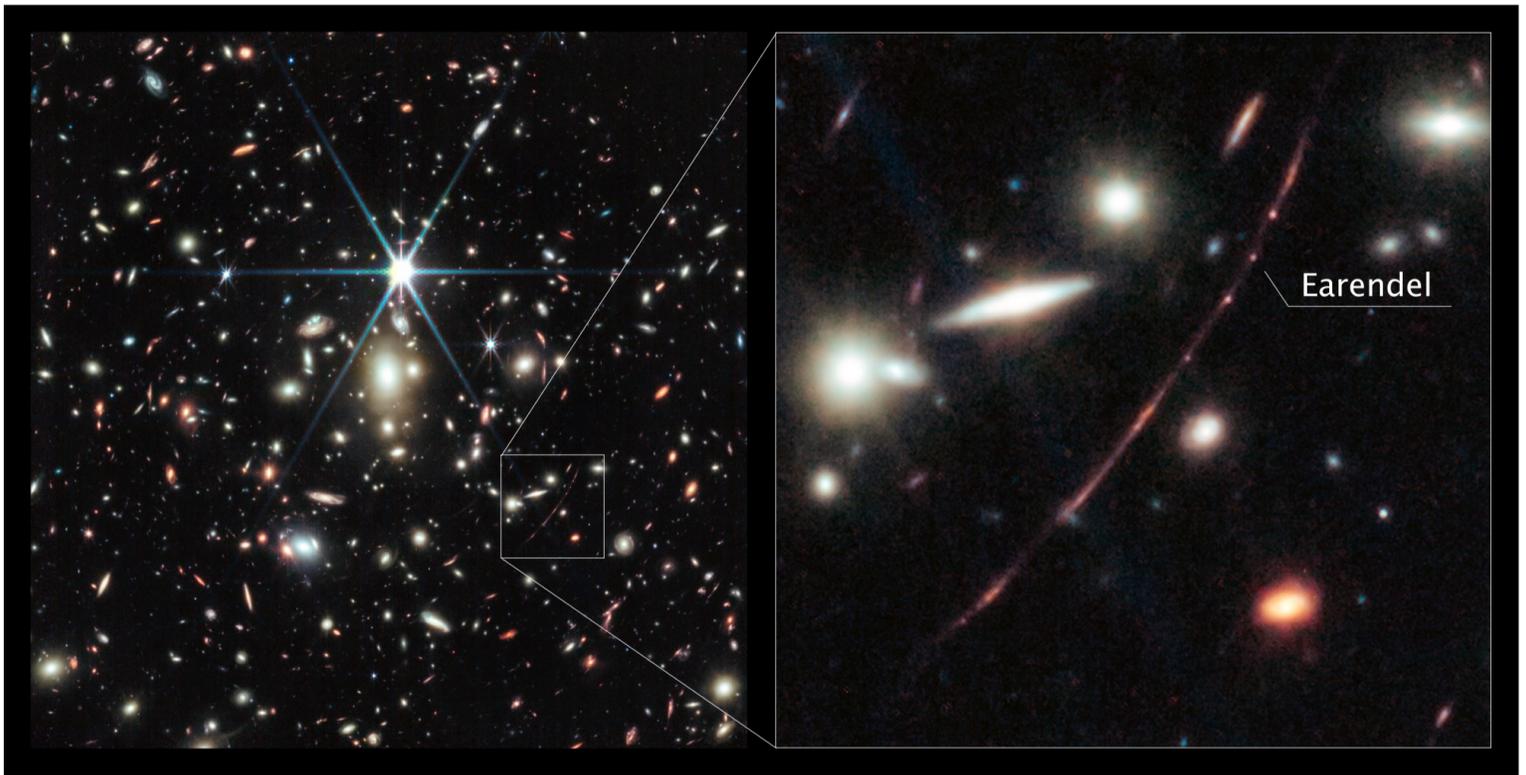
ALL IN ONE APP

No matter the type of photography you love: Landscape, Milky Way, Moon, Sunrise, Sunset, Architecture, Star Trails, Drone, Meteor Showers, Solar eclipse, Lunar Eclipse, Time lapse, Wedding, Portrait or Travel...

PhotoPills is your photography planning app. It helps you PLAN your photos ahead of time.. So you're always at the right place at the right time to capture the best photo possible.

 <p>PLANNER</p> <p style="font-size: x-small;">Easily plan images nobody has taken before</p>	 <p>WIDGETS</p> <p style="font-size: x-small;">Traveling? Enjoy all daily Sun, Moon and Milky Way information in just one swipe</p>	 <p>2D MILKY WAY</p> <p style="font-size: x-small;">Plan any Milky Way shot you imagine comfortably on a map</p>	 <p>AUGMENTED REALITY</p> <p style="font-size: x-small;">Get it right! Visualize Sun, Moon and Milky Way position and path</p>
 <p>AWARDS</p> <p style="font-size: x-small;">The place where your photos are honored, rewarded (\$6,600) and shared with the World</p>	 <p>LOCATIONS & PLANS</p> <p style="font-size: x-small;">Explore, manage your locations. And never miss a unique scene again, save your photo-plans</p>	 <p>SUN</p> <p style="font-size: x-small;">All you need to know about the Sun, twilights and magic hours</p>	 <p>MOON</p> <p style="font-size: x-small;">Rise and set times, calendar, phases and Supermoon dates</p>
 <p>EXPOSURE</p> <p style="font-size: x-small;">Easily calculate equivalent exposures with filters, in low light and at night</p>	 <p>DOF</p> <p style="font-size: x-small;">Decide what you want in sharp focus and tell your story</p>	 <p>TIME LAPSE</p> <p style="font-size: x-small;">Quickly compute parameters needed to collect sequences of still images to create time lapse videos</p>	 <p>+10 EXCLUSIVE BONUS</p> <p style="font-size: x-small;">Discover many more unique benefits inside!</p>

Farthest star ever captured by NASA's James Webb Space Telescope



From [National Post](#).

New images of the farthest star ever detected have been captured by NASA's James Webb Space Telescope.

Named Earendel, which means Morning Star, the massive B-type star burns twice as hot as the Sun and is about a million times more luminous, according to the space agency.

The star, which was first detected by the Hubble Space Telescope last year, is believed to have originated ***within the first billion years of the universe's existence.***

NASA says the star was captured with the aid of gravitational lensing, a quirk that occurs when a massive celestial body, in this case, the galaxy cluster WHL0137-08, causes a curvature of space-time and produces a magnifying effect, allowing astronomers to peer through the cluster.

Astronomers believe the cluster is likely to persist until the present day and sheds light on how clusters in the Milky Way might have looked when they formed 13 billion years ago.

NASA says the discoveries have "opened a new realm of the universe to stellar physics, and new subject matter to scientists studying the early universe."

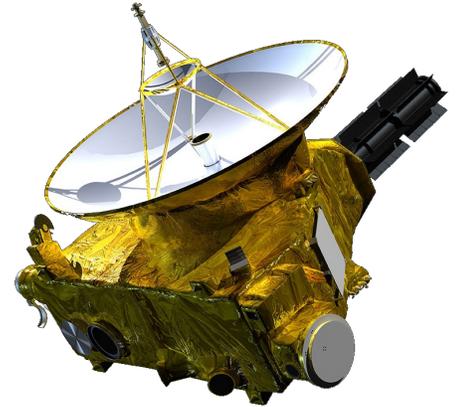
Astronomers are analyzing data from Webb's Near-Infrared Spectrograph instrument observations to establish precise composition and distance measurements for Earendel and the Sunrise Arc galaxy.

Before Earendel was captured, astronomers previously observed distant stars around 3 and 4 billion years after the big bang. The latest discovery could be a step toward the eventual detection of the first generation of stars, according to NASA.

New Horizons is So Far Away, it Can Measure the True Darkness of the Universe

Just how dark is the night sky?

If you step outside during a moonless night and look up, it probably doesn't look that dark at all. Streetlights or nearby porch lights fill the air with a background glow, particularly if they happen to be bluish-white LEDs. Light pollution in your neighborhood is likely so bad that you can only see a few bright stars. Even in somewhat rural areas, our skies are so bright that the Milky Way isn't really visible. In North America and Europe, only about a quarter of children have seen the Milky Way.



To get away from all the light pollution you need to travel to a pretty remote corner of the world. One of the most remote is the Andean desert in Chile.

If you have a chance to visit one of the major observatories there you can catch a glimpse of the darkest skies in the world. On a moonless night with the Milky Way overhead you can see a vast sea of stars and shadow constellations along the multicolored glow of the galactic center. There the skies are so dark that the Milky Way casts a faint shadow you can see when your eyes are fully dark adapted.

But even that is not a truly dark sky. Our atmosphere emits a faint glow even in the darkest night. It's caused by ultraviolet sunlight and cosmic rays which ionize Earth's upper atmosphere. This airglow isn't noticeable when we look directly overhead, but it's there, and it limits the view of Earth-based telescopes. Even our best observatories have to deal with light pollution.

So we launch telescopes into space. Beyond our atmosphere, the Hubble and Webb telescopes surely get a pure view of the sky. Wondrous as their images are, they don't capture the truly dark sky. Sunglow is still an issue. Our solar system is filled with diffuse dust, and every particle scatters light back toward our world. On Earth, we can see this dust-scattered glow as the zodiacal light. It's faint to our eyes, but visible even in space. The night of interplanetary space is dark, but still not dark enough.

To get a real view of the dark sky, we would need to travel beyond the dust, to the furthest edge of our solar system. Far beyond the orbit of Pluto. Voyagers I and II have traveled that far, as have Pioneers 10 and 11. We've long lost contact with the Pioneers, and while we still communicate with the Voyagers, they can't transmit any useful images to us. But there is a distant spacecraft that can.

New Horizons flew past Pluto in 2015, and then past the Kuiper Belt Object Arrokoth. It is now twice as distant from the Sun, and its cameras can still gather data. Recently the New Horizons team tried to capture the fragile darkness of the universe. They aimed New Horizons at a patch of sky far away from the Milky Way, away from the Sun, and away from bright stars. Then they measure how much light the camera captured.

When they compared that amount to the amount captured by Hubble's view of dark sky, they found it was darker by an expected amount, but there is still some faint glow astronomers can't explain. If you calculate the background light you'd expect from distant galaxies all the way back to the big bang, New Horizons measured about twice as much. So the team plan to observe 15 other dark locations over the next month, hoping to see the naked dark of the cosmos, or to verify this mysterious background glow.

And perhaps through the darkest skies, we will see the light.

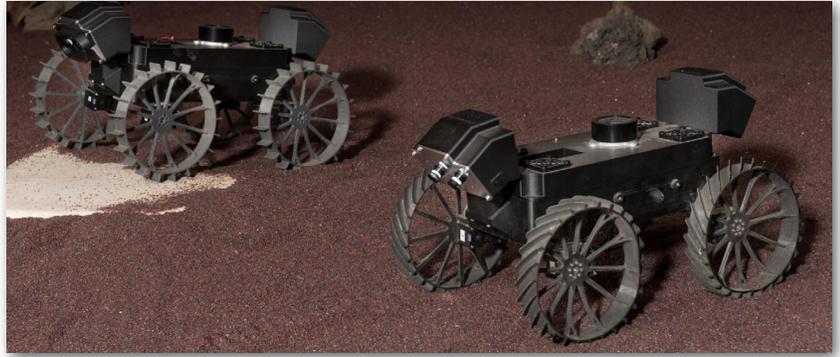
You can learn more about New Horizons on [their mission website](#).

From [UniverseToday.com](#)

NASA Plans to Unleash a Wolf Pack of Rovers Onto the Lunar Surface in 2024

From [UniverseToday.com](https://www.universetoday.com)

What's better than one lunar rover? Three lunar rovers! In 2024, NASA plans to send a team of suitcase-sized wheeled robots to the Moon as part of the Commercial Lunar Payload Services (CLPS) program. Collectively called CADRE – Cooperative Autonomous Distributed Robotic Exploration – the rovers will spend one full lunar day (14 Earth days) exploring the Moon and showing off their unique capabilities.



The CADRE rovers are special – they are designed to be able to complete tasks without relying on humans to solve their problems. Mission control will send the rovers tasks, but it is the rovers' job to figure out how best to carry them out while avoiding obstacles and conserving precious electricity.

“Our mission is to demonstrate that a network of mobile robots can cooperate to accomplish a task without human intervention – autonomously,” says Subha Comandur, the CADRE project manager at NASA's Jet Propulsion Laboratory. “It could change how we do exploration in the future. The question for future missions will become: ‘How many rovers do we send, and what will they do together?’”

Some of the planned tests for CADRE include driving in formation while maintaining relative positions from each other, all while avoiding potentially dangerous or rough terrain. In another test, they will use stereo cameras to create a 3D topographical map of a 400 square meter area.

They will also test how the rovers would react upon losing one of the trio. Part of the use case for a swarm of rovers like this is that one rover could explore a dangerous but scientifically interesting area, like a lava tube, without endangering the entire mission. One rover could sacrifice itself for important but difficult-to-reach data, which it would beam back to its counterparts, and they would continue on their mission without it.

That is a vision of the future, of course. CADRE is a technology demonstration mission and not, primarily, a mission of exploration. The pack of rovers will remain reasonably close to the lander which carries them to the surface, which will act as a home base and communications center.

But the Moon is a hazardous environment nonetheless, and they will be pushed to their limits keeping their power supply and cooling systems in working order. Part of CADRE's testing campaign will involve ensuring the cooperative autonomy software on board each rover has enough power to run their processors. Each of the rovers, and the home base, carry a processor already being used in another example of robotic teamwork: the Ingenuity helicopter on Mars, which has been scouting ahead of the Perseverance rover in Jezero Crater.

The lunar environment offers different challenges than Mars does, with its especially high daytime temperatures. The rovers will work in half-hour stints, then ‘sleep’ to recharge, radiating away heat and keeping their processors in good shape. Upon waking, they can share their respective working conditions with each other, choosing a leader to assign the next tasks, and carrying on with the mission.

Assuming all goes well, the rovers are carrying scientific instruments too. In particular, they have ground penetrating radar that can peer as deep as 10 meters below the lunar surface. Working in tandem, they will be able to create a 3D map of the subsurface that a single rover wouldn't be able to do on its own.



Stephan's Quintet by Scott Cruzen: (NGC7317, NGC7318A&B, NGC7319, NGC7320)

Plus bonus galaxies NGC7320, NGC7320C, PGC141041, and PGC141039

Shot in Cape Coral 8/21 and 8/22

- 450 two-minute subs
- 50 each Darks, Flats, and Biases
- Processed with SiriL/SiriLic, GIMP, DarkTable, Topaz Denoise

8" F8 Ritchey-Chretien Scope, 1622mm FL

EQ6-R Mount

60mm F4 guide scope

ASI533MC-Pro cooled OSC imaging camera

ASI224MC Guide camera

ASIAIR Plus Controller

No filters other than Optolong 2" UV/IR



Deer Lick Group and Stephan's Quintet by Scott Cruzen.

Astro Tech 80mm F6 EDT APO
EQ6-R Pro Mount
ASI533MC Pro cooled OSC with Optolong UV/IR
60mm F4 Guide Scope
ASI224MC guide camera
ASIAIR Plus
524 five-minute subs
SiriL/SiriLic, GIMP, DarkTable, Topaz Denoise



NGC281 Pacman Nebula by Scott Cruzen

Shot in HOO in Cape Coral (Bortle 5)

Astro Tech 80mm F6 EDT APO refractor

ASI533MC Pro Cooled OSC

EQ6-R Pro Mount

ASIAIR Plus

60mm F4 Guide Scope

ASI224MC Guide Camera

6nm H2/OIII filter

6 hours of 4-minute subs

SiriL/SiriLic, GIMP, DarkTable, Topaz Denoise



Cocoon Nebula by Scott Cruzen

OSC camera with a dual narrow band Ha/OIII filter and ran it through SiriL's Hubble palette script
About 8 hours of 2-minute subs on a 200mm RC with 533MC-Pro.



Pacman Nebula NGC 281 by Ray Gregory

Emission nebula in Cassiopeia, in Perseus spiral arm, 20x30 arcmin, 9500 ly

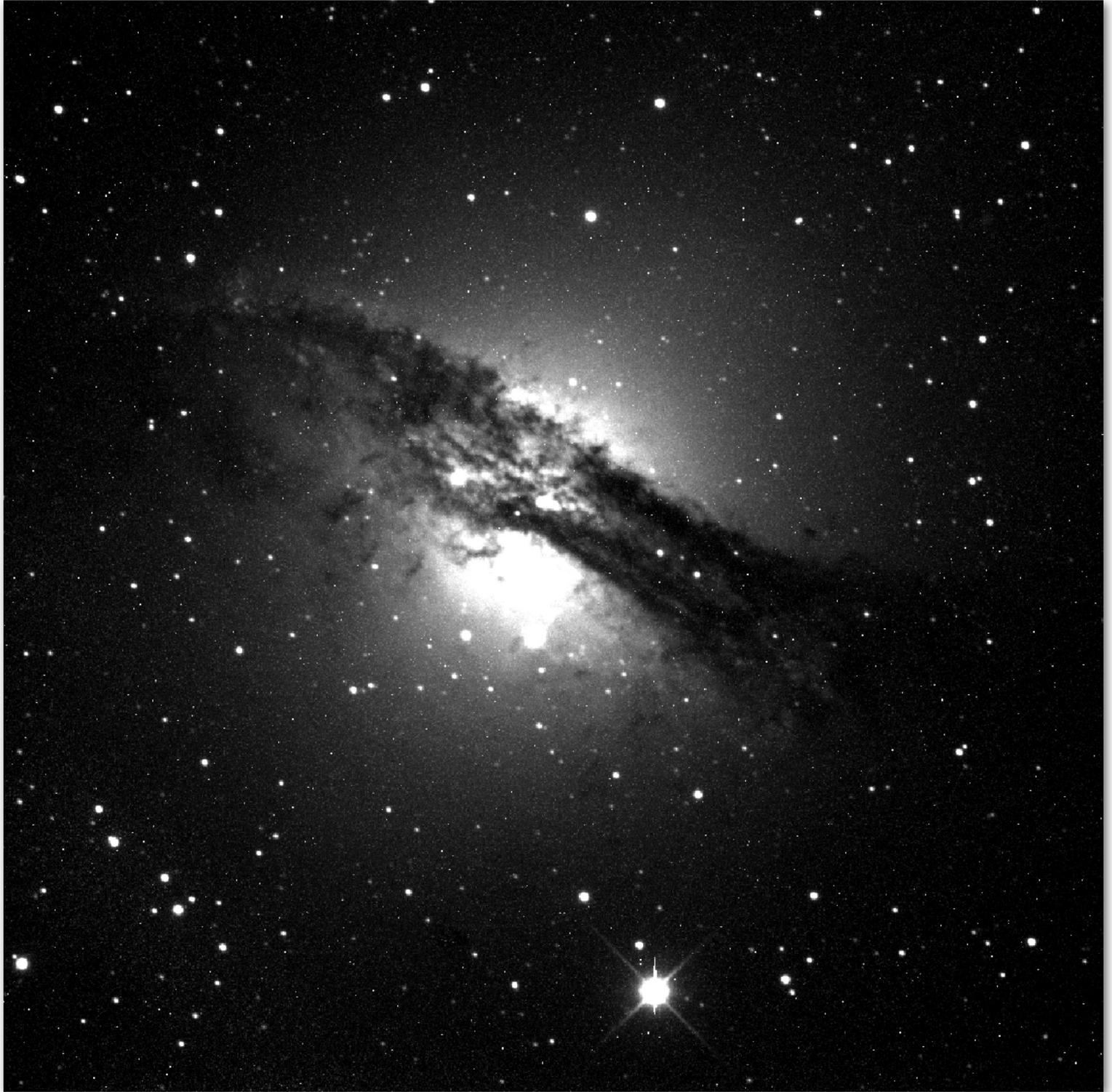
Imaged remotely from Mayhill, NM

Takahashi FSQ 106N, SBIG ST 2000, Software Bisque MY T mount, Pixinsight, Narrowband, Hubble Palette

Baader (SHO), 6 hours

S-120 H-60 O-180

2 observing sessions



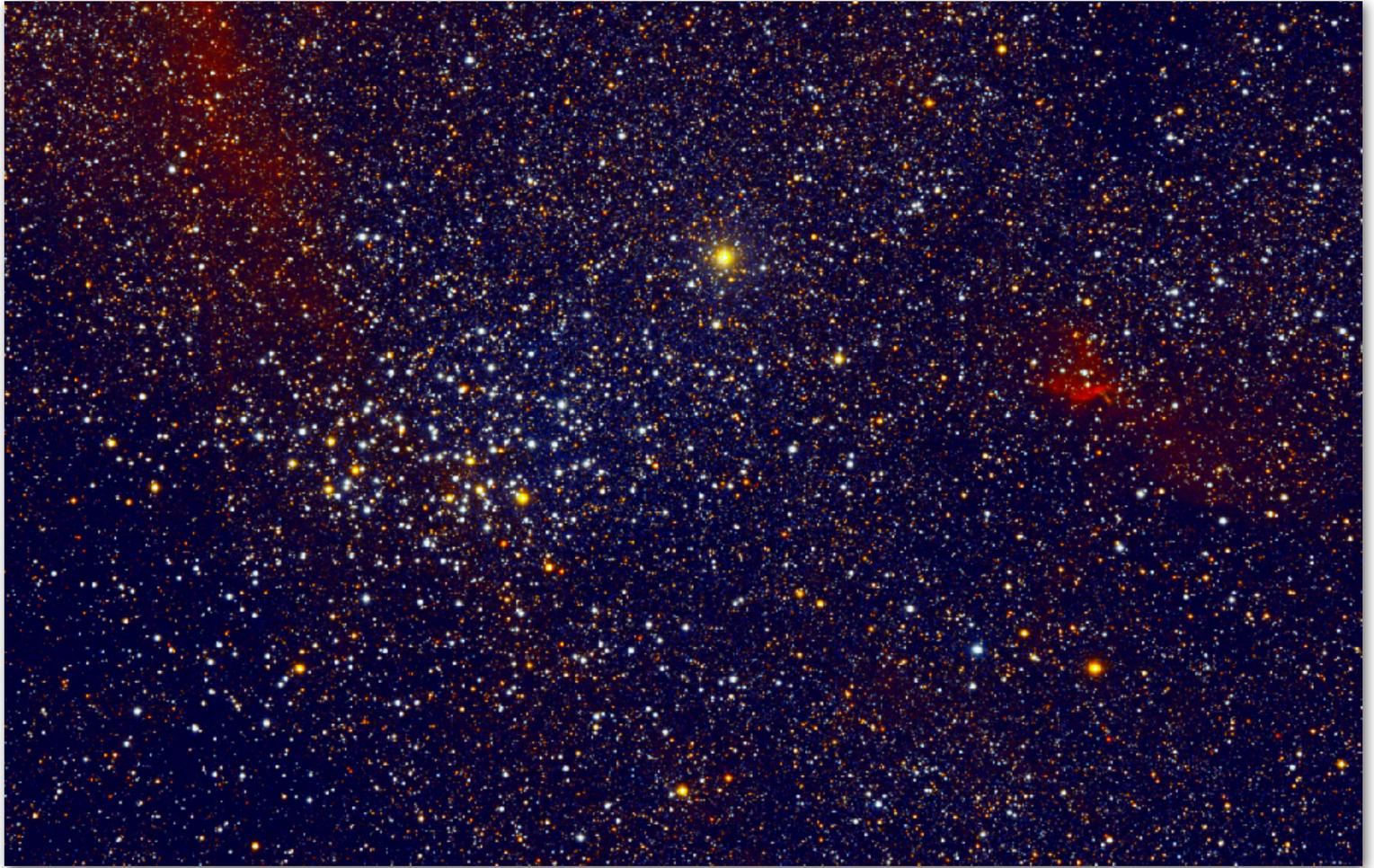
Centaurus A, NGC 5128 by Ray Gregory

Active galaxy in Centaurus, 12 MLY

Imaged Remotely from Cerro Tololo, Chile

20" Plane Wave CDK on Plane Wave mount, SBIG CCD

B&W single exposure 30 min



Wishing Well Cluster, NGC 3532, Carina, 1321 LY, by Ray Gregory

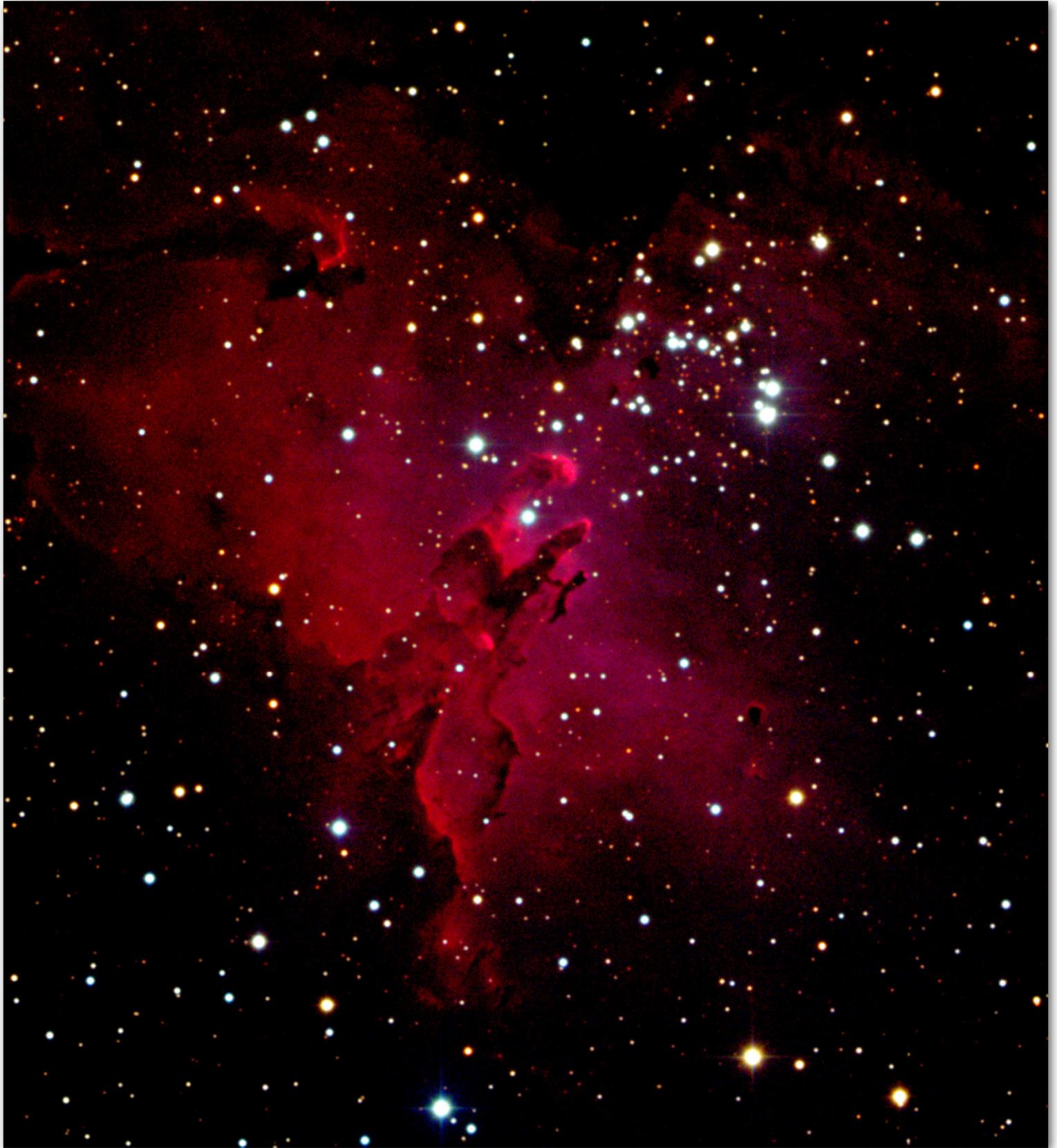
Televue NP 127, FLI Pro Line, Baader RGB, Software Bisque ME, Pixinsight

Imaged from Siding Spring, Australia

90min

R-30 G-30 B-30

1 observing session



Eagle Nebula, Star Queen, M16, NGC 6611, in Serpens, 5.7 ly, "Pillars of Creation" By Ray Gregory

Plane Wave 17" CDK, SBIG CCD, Baader RGB, 120 m exp R-30 G-45 B-45

Mayhill, NM

1 observing session



Lagoon Nebula, M8, NGC 6523, Sharpless 25 by Ray Gregory

In Sagittarius, giant interstellar cloud with Bok Globules, emission nebula w/HII region, 5k LY
Televue NP 127, FLI Pro Line, Baader RGB , Software Bisque ME, 4 hours R-60 G-90 B-90
Imaged remotely from Siding Spring, Australia
1 observing session



M16 - The Pillars of Creation by Dick Cogswell

C11, 2800mm fl, around 3.5 hrs total time; LRGBHa.



M27 Dumbbell Nebula - Ray Bratton - Addison, IL,
8/31/2023, ES127 FCD Triplet, EQ6R Pro, ASI294MC Pro,
Telévue 3X, ASI AIR+, 120g, 12 300s exp (1 hr), 0°C,
ZWO Duo filter, full moon, bortle 8,
APP, PS RAW, Topaz DeNoise



Super Blue Moon 08/31/2023
Ray Bratton, Addison. IL
Canon EOS Ra, 100-400mm, 2X, @800mm,
680nm IR Filter, f11, 0.5 sec, PSRAW



The Deerlick Group & Stephan's Quintet by Linwood Ferguson

Full image: <https://www.astrobin.com/full/bkfa15/0/>

One thing I did here as an experiment is left the image completely uncropped, not even removing the slightly distorted edges from overlap on stacked images, to be able to see how consistently the full frame was with the SVX152T and flattener. It does a very nice job, I think, of round stars and flat field. This was at about 1200mm focal length and F8, and represents about 34 hours of R, G, B data with 5 hours of Ha added in only in the main galaxies. A synthetic luminance was used. I also changed order a bit, doing noise reduction only at the end after stretching, as I think it gave a more even background, which was otherwise splotchy (not exactly noisy, large scale splotchy stuff).

I had wanted to get a night at Big Cyprus on this to get more of the faint detail on the quintet especially where I think there is tidal trails that are lost in the light polluted mess we call home in Florida.

Anyway, this is my "summer" image, I do not think I will get more than one at the rate the weather is going.

Photographing the Milky Way

By Mike Jensen

Earlier last month I traveled to south central Utah, Capitol Reef National Park (see marker on light pollution map below). I'd never been there before (and will most likely go back soon). My goal was to truly experience a Bortle 1 sky. As I was flying from Dallas to Salt Lake City I noticed a HUGE plume of smoke from a forest fire and I hoped it was not near where I was going to be (which of course it was). Capitol Reef is about a 3.5 - 4 hour drive from the SLC International airport. I had lived in SLC my junior year in high school and thought I knew my way around, not! The highways are like 70 mph spaghetti courses. I couldn't wait to get south of Provo where the traffic would ease off. Also the speed increased to 80mph. I tried that in my rental Ford Escape and decided that 75 was enough for that model.



Once I arrived in the rural area which surrounded Capitol Reef I noticed the aforementioned plume of smoke was appearing closer and closer to the park. So how was I going to see the Milky Way through that smoke? I checked in to my cabin, went to dinner to contemplate the situation over a Chicken Caesar salad. I decided that I would just wing it. I'll admit, I was a bit desperate as the forecast for the week ahead was partly cloudy with a chance of clouds. I had to take advantage of any chance I could of getting to the MW. I headed out at about 10 pm and headed East and then North, and up in elevation, away from the smoke plume. I found

a farm road that looked clear of traffic and lights. I got out of the car and looked up, (queue fanfare music) STARS, and the Milky Way, and the Big Dipper, and Meteors (from the Persiuds). I was ecstatic!

I set up my tripod, camera with wide angle (20mm), large aperture (f1.4) lens. My goal was to shoot multiple shots of the Milky Way. The idea here is a bit different from the Deep Sky photography we do with our telescopes. In Deep Sky photography we shoot multiples to get more light, and then we have to deal with the noise caused by a heated camera sensor. In wide-field astro photography with a DSLR or Mirrorless camera, we shoot multiples and stack them with the goal of reducing the noise (using Starry Starry Landscape Stacker software). You manage the light by the ISO (camera's sensors sensitivity), aperture (size of the lens opening) and the length of exposure. This is true photography, the way I've been doing it for over 50 years.

Over the next week I spent my days scouting the park and taking "documentary" daytime pictures. Then I was back out at night, starting during blue hour, usually about 9pm at the time. I worked multiple locations each night, usually until the moon came up, anywhere from midnight to 3am.

In my humble opinion, the results were spectacular! The combination of the stellar brightness of the Milky Way with the foreground of beautiful red & white sandstone rocks made for some of my best Milky Way shots ever. I came away from the experience ready to schedule a road trip to the west next year when the clouds, humidity and heat of Southwest Florida are at their worst. See photos below and on following pages. Enjoy!





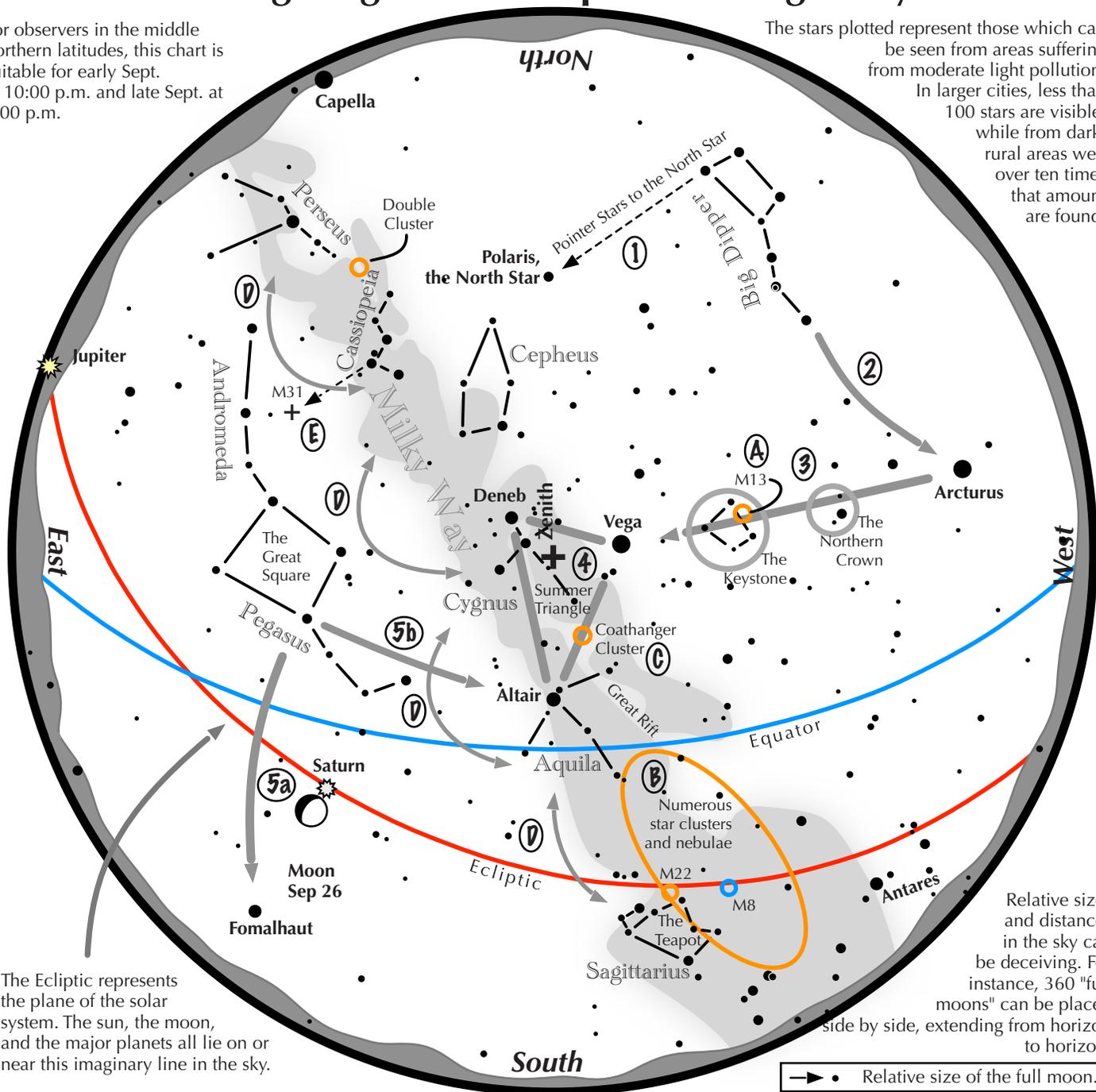


Mike Jensen
ASTRO PHOTOGRAPHY

Sky Chart Navigating the mid September Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Sept. at 10:00 p.m. and late Sept. at 9:00 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 mid September night sky: Simply start with what you know or with what you can easily find.

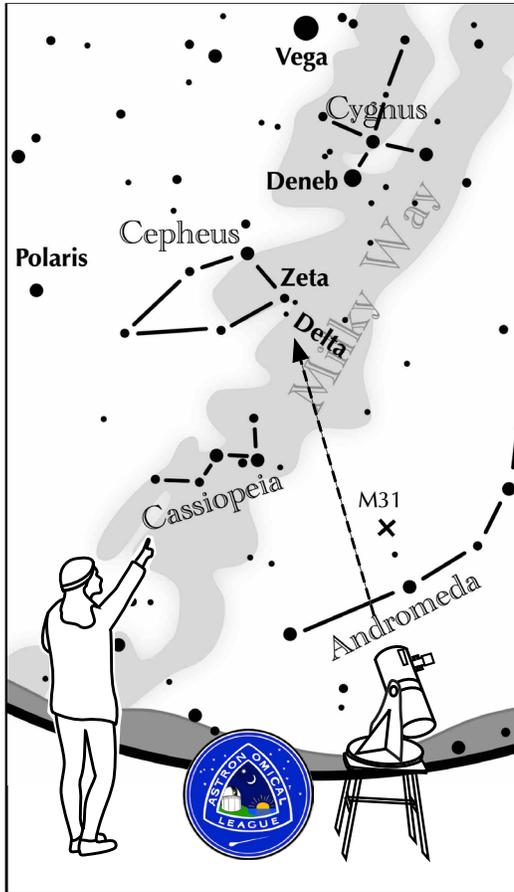
- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the September evening sky.
- 3 Nearly overhead shines a star of similar brightness as Arcturus, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 The stars of the summer triangle, Vega, Altair, and Deneb, shine overhead.
- 5 The westernmost two stars of the Great Square, which lies high in the east, point south to Fomalhaut. The southernmost two stars point west to Altair.

Binocular Highlights

- A: On the western side of the Keystone glows the Great Hercules Cluster.
- B: Between the bright stars Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.
- E: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



ASTRONOMICAL LEAGUE Double Star Activity



Other Suns: Delta Cephei

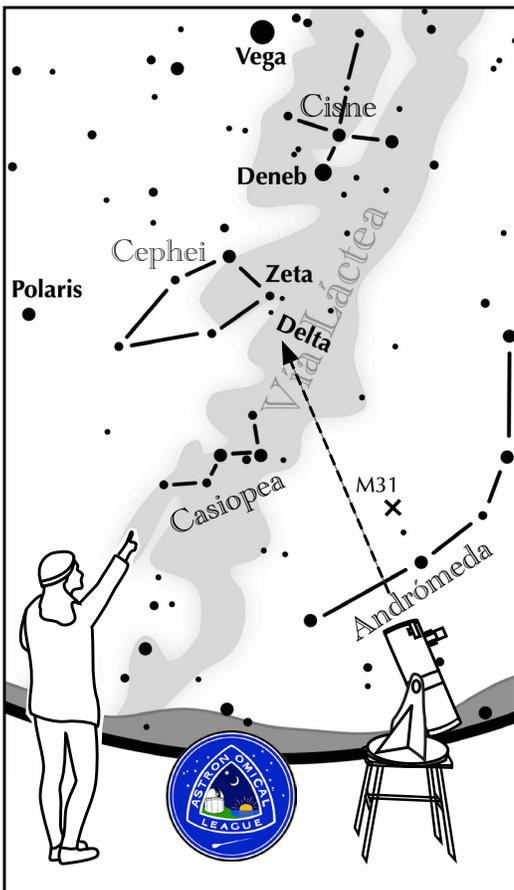
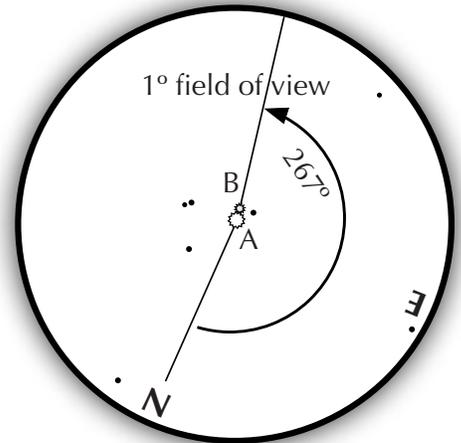
How to find Delta Cephei on a September evening

Face northeast and find bright Deneb, the northernmost star of Cygnus. It is nearly overhead. Between Deneb and the "W" shaped Cassiopeia lies the house-shaped constellation Cepheus. Find Zeta, the lower left star of the "house." Dimmer Delta shines just below it.

Suggested magnification: >20x
Suggested aperture: >2 inches

Beta Capricorni

A-B separation: 41 sec
A magnitude: 4.2
B magnitude: 6.1
Position Angle: 191°
A & B colors:
yellow, blue



Otros Soles: Delta Cephei

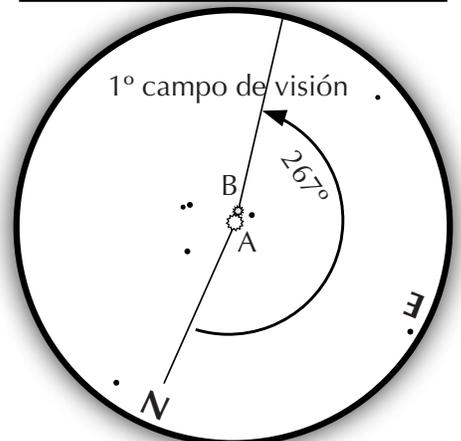
Cómo encontrar Delta Cephei en una tarde de Septiembre

Mire hacia el noreste y encuentre a la brillante Deneb, la estrella más al norte de Cisne. Está casi arriba. Entre Deneb y Casiopea en forma de "W" se encuentra la constelación de Cefeo en forma de casa. Encuentra a Zeta, la estrella inferior izquierda de la "casa". La Delta con brillo debil, esta justo debajo de ella.

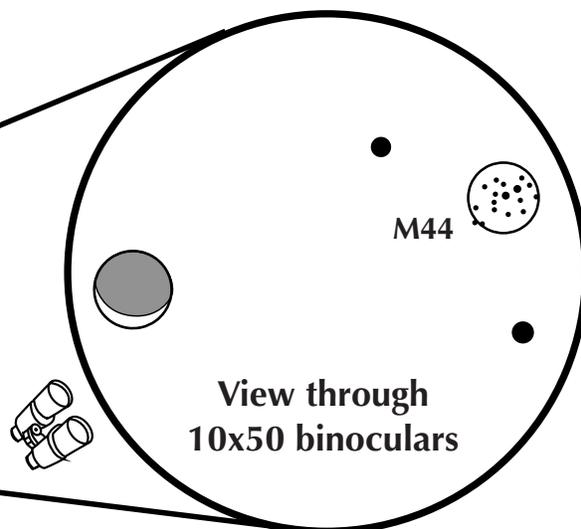
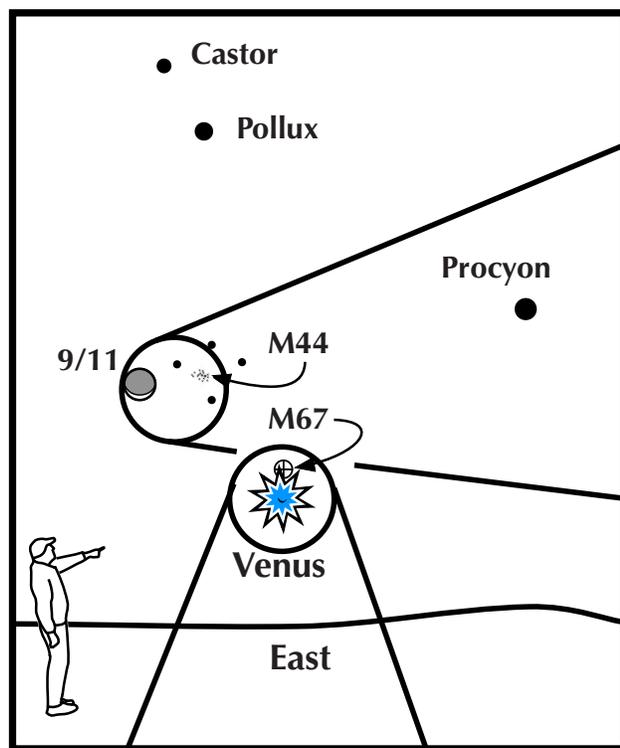
Ampliación sugerida: >20x,
Apertura sugerida: >50 mm

Delta Cephei

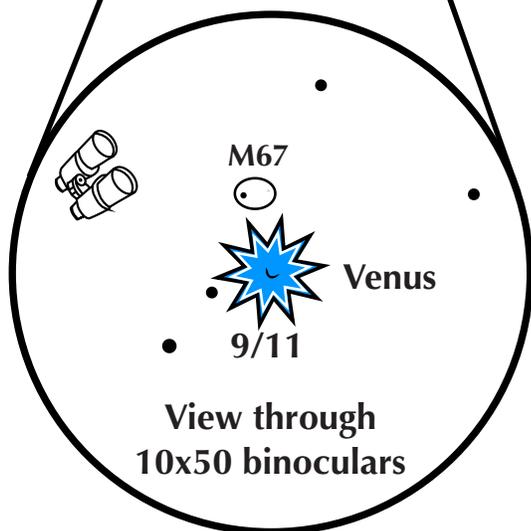
A-B separación: 41 sec
A magnitud: 4.2
B magnitud: 6.1
PA: 191°
A & B color:
amarilla, azul



If you can see only one celestial event in the morning this September, see this one.

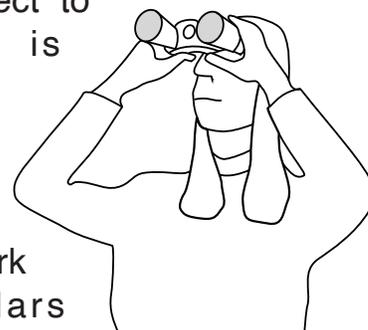


Moon visits M44, Venus visits M67



On the morning of Sep 11, look to the east 90 minutes before sunrise.

- The crescent moon, full with earthshine, glows left of M44, the Beehive cluster.
- M44 can easily be seen in binoculars.
- The dazzling object to their lower right is Venus.
- Just above Venus lies another star cluster, M67. If viewed from a dark location, binoculars should reveal its fuzzy presence.
- If the binoculars are securely mounted, the tiny crescent of Venus should be barely discerned amid the planet's glare.



Other Clubs (of the Solar System)

Solar System – These are the tasks that can be done this month:

Sun – Any clear day is a good time to get those sunspots.

Sunset is 2003 mid-month.

Venus, Jupiter, and Uranus are too close to the Sun or are morning objects.

Moon:

The Maria requirement can be done any time the moon is visible. Look before 8/8, and after 8/22 for the fullest views.

The Highlands requirement can be done at the same time.

The Crater Ages requirement is best done on 8/21 or 8/22.

The Scarps requirement is best done on 8/23.

Occultations occur all the time, the bright ones can be found on the internet. Objects disappear on the East side of the moon.

Mercury is in Leo and sets at 2123 at mid-month.

Mars is in Leo and sets at 2240 at mid-month.

Asteroids – Course Plotting and Measuring Movement requirements can be done at any time on any asteroid.

Ceres is in Virgo and is up all evening mid-month.

Saturn is in Aquarius and rises at 2255 at mid-month. All requirements can be done when Saturn is visible: markings, moons, etc.

Neptune is in Pisces and rises at 2334 mid-month.

Pluto is in Sagittarius and is up all evening mid-month.

Lunar

Key timings are indicated below:

New, 8/15 4 days, 8/19 7 days, 8/22 10 days, 8/25 14 days, 8/29

Old moon in new moons arms – before 0038 on 8/19, ~10 % illuminated. (72 hr > New)

New moon in old moons arms – after 0038 on 8/13, ~10 % illuminated. (72 hr < New)

Waxing Crescent – before 0038 on 8/18, ~4 % illuminated. (48 hr > New)

Waning Crescent – after 0038 on 8/14, ~4 % illuminated. (48 hr < New)

Astronomical Events this Month:

- 8/2 – Lunar Perigee
- 8/6 – Jupiter at Western Quadrature
- 8/8 – Eta Eridanids Meteor Shower
- 8/9 – Mercury at Greatest Eastern Elongation
- 8/9 – Mercury at Dichotomy
- 8/13 – Perseid Meteor Shower
- 8/13 – Venus at Inferior Conjunction
- 8/15 – Uranus at Western Quadrature
- 8/16 – Lunar Apogee
- 8/17 – Kappa Cygnids Meteor Shower
- 8/22 – Mercury is Stationary
- 8/27 – Saturn at Opposition
- 8/28 – Uranus is Stationary
- 8/30 – Lunar Perigee

* - Although these clubs are not detailed in this “What’s Up Doc?” handout, you can get information on many of their objects by using the “What’s Up Tonight, Doc?” spreadsheet (version 4.1). To get your copy, talk to the Doc, Aaron Clevenson, by sending an email to aaron@clevenson.org. It is also available on the club website.

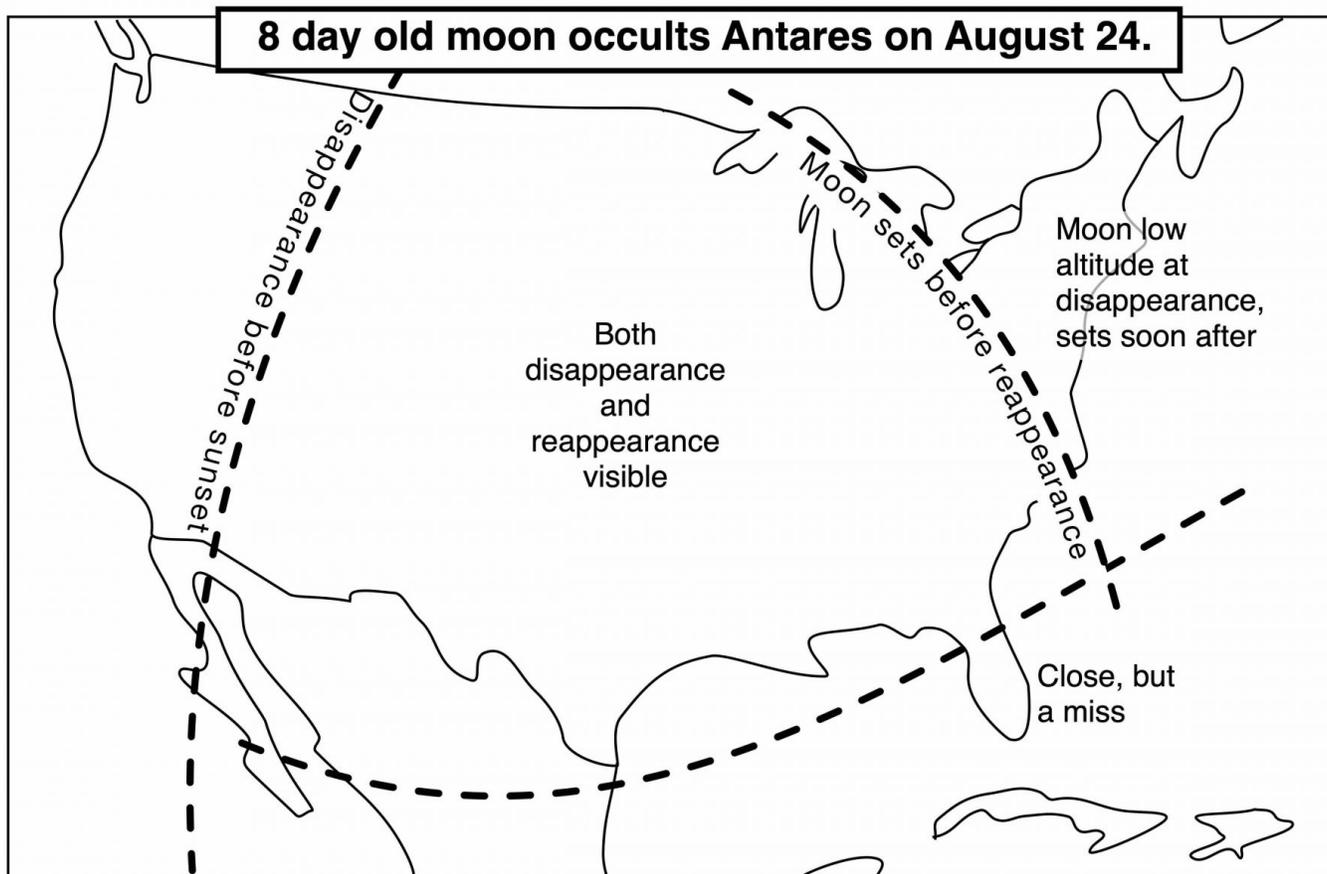
† - “What’s Up Doc?” is used with permission from Warner Bros. Entertainment Inc.

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Inspirity Observatory, 2505 S. Houston Avenue, Humble, TX: www.humbleisd.net/observatory

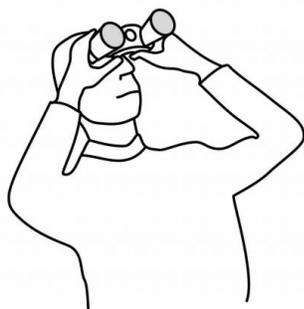
A.

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

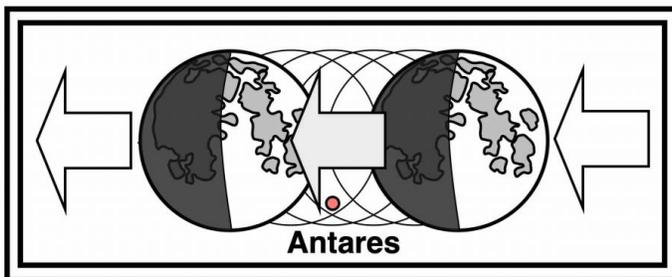


The full occultation event on Aug. 24 of Antares by the moon occurs for the central part of the US. Both coasts will not see the complete event. For disappearance and reappearance times in your area, visit the International Occultation Timing Association webpage:

<http://lunar-occultations.com/iota/bstar/0824zc2366.htm>



Start looking in the southwest shortly after sunset on August 24. Watch the moon slowly approach Antares, then suddenly block it. Binoculars will give better view.



Occultations demonstrate the moon's eastward orbital motion as Earth's rotation causes it to move in a westward arc across the night sky.

Meeting Minutes

Southwest Florida Astronomical Society member minutes for August 3 2023 Calusa Nature Center Planetarium and Zoom meeting

President Risley called the meeting to order at 7:00 PM, asked for new attendees, advised that there were 15 members on Zoom and 13 members in person....and then asked John MacLean to introduce the evening speaker.

John MacLean introduced Roger Lascorz Guiu, IT & Communications services directorate for NASA. Roger thanked all for inviting him and applauded our society for meeting in a Planetarium as it made him happy to see that. He then presented his program on THE ARTEMIS MISSION to the moon which will incorporate one female and one person of color, a first. The name stems from the Greek twin sister of Apollo and Goddess of the Moon in Greek mythology. The goal is to land by December 2024 but no sooner. At the time of landing, the astronauts will study planetary processes, understand volatile cycles, create a platform to study the universe and the relationship of the Sun. Objectives of the mission are field geology, collection of new samples, ability to access cold temperature regions and installation of surface instrumentation. Roger compared the size of the SLS ORION to others, such as the Shuttle and Saturn spaceships. (Space Launch System). He closed by illustrating the Artemis Base Camp, habitable mobility platform, types of spacesuits, lunar terrain vehicle and the human landing system. All applauded Roger for his fine presentation.

Business Meeting:

Brian thanked Mike Jensen for his newsletter summary of the bylaws revision and easy vote platform. Mike said that it takes 2/3rds of the membership to approve said revised bylaws and all need to participate ASAP. Brian said we will be calling those who have not voted by the end of September.

Brian asked for Tom Segur to report on happenings in Charlotte County. Tom said:

- 1) that due to low or no participation from the public, the August 5th meeting is canceled.
- 2) FSW observing starts September 8th
- 3) Solar Observing starts on September 23rd.
- 4) The October 14th partial solar eclipse will be held around noon for the duration, more exact data to follow.

President Risley advised that the weather in mid August is awful at night time and that he is canceling the group viewing of the Perseid's meteor shower, typically August 12th for a few nights.

The topic of new zoom and computer equipment took some 20 minutes. Brian opened it up by stating that the cost of the new equipment needed may be as much as we have in the bank, that he does not want to raise dues at this time, and that he questions whether a 4K unit versus lesser units are required illustrating that one is \$600 and the other over \$1,000. Brian said we must establish a budget first. Mike Jensen questioned Brian on his numbers and analysis, stating that we need the brightest among us to make these computer and zoom camera analysis. Linwood Ferguson stated that we first need a survey to the members to figure out if we even want to stay at the Planetarium or move somewhere else. Mike echoed Linwood's comments and Brian illustrated that the Planetarium is only \$500 per year which includes a storage facility. Brian said a storage facility alone is \$150 per month and that the Planetarium is the best setting for our venue. Mike said 'get rid of the stuff' or store the remainder in someone's garage. Dan Dannenhauer advised that to store others property in ones care, custody and control is an insurance problem and we ought not do that. Brian objected and said we must have storage facilities and the Planetarium provides that.

Brian again illustrated that the put up and tear down of equipment elsewhere other than the Planetarium is something he did not want to do. Back and forth the discussions went until Sean Dey made a motion that the

officers, Tom Klein and John Uther comprise a committee to develop specifications and costs of what is needed. Ray MacMullen seconded and the motion passed. Much discussion again followed regarding the venue location and that Mike and Linwood both said that the equipment would depend on the location, which must be decided first. Round and round it went. Mike said he was out of town until August 18th. Dan said let's meet on Monday the 7th at 7 PM via zoom. John Udart, Tom Klein and Brian agreed. Tom will set up the zoom link and be host. Dan will check on venues at FSW and FGCU with cost estimates prior to the meeting and will take the specifications to vendors for cost estimates after the meeting. Time to move on.

Officer and Committee reports:

President: Brian Risley stated that he was checking to see if the Fort Myers Illuminarium is available for the October 14th Solar eclipse. He will let us know.

Vice President: No additional report.

Secretary: Dan Dannenhauer asked that July minutes be approved. So moved by John MacLean and seconded by Ray McMullen. Motion passed unanimously.

Treasurer: John MacLean reported that we are okay and that his report is in the newsletter.

Librarian: Maria Berni reported that she has placed new magazines on the rack at the entrance of the Planetarium for all to read and return.

Program Committee: John MacLean reported that he has secured speakers through January and that the list and topics can be viewed in the newsletter.

Charlotte Events: Tom Segur advised that FSW had hired a new professor to teach Astronomy and Physics, stating that FSW had not had an Astronomy teacher for many years and Tom was meeting with him to coordinate SWFAS outreach activities with him.

Adjourn: At 9PM President Risley asked for a motion to adjourn. So moved by Ray MacMullen and seconded by Maria Berni.