The Eyepiece

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

"Cosmic Cliffs" in the Carina Nebula
ONE OF THE 1ST IMAGES BY THE WEBB TELESCOPE

NEW MEETING TIME - 7PM!

Mike Jensen - Editor

Greetings Everyone! If you look at the above image, one of the first from the James A. Webb Space Telescope I'm sure you'll feel it compares closely to some of the images from our Astro SIG group. I say that "tongue in cheek" as we probably have some with the talent to produce an image like this, we certainly do not have the budget. Oh, and we have clouds to deal with. Something we have not found a way to remove despite much conversation about it.

This issue you will find is very Webb centric. Mostly because the JWST (James Webb Space Telescope) has been all over the astronomy news this month. From it's initial release of awe inspiring images to the news that the JWST has been hit by some micro-meteorites, yikes! Yes, there was damage but it sounds like it will be able to be mitigated.

Knowing that we're in the "dog days" of summer I've included some of my favorite space/astronomy oriented shows, mini-series and documentaries (several MUST SEE'S).

Page two includes the new schedule for our night and solar observing programs, beginning in the Fall.

Page 4 includes a great AL report from our own John MacLean and page 6 includes an amazing read on the Artemis I project to the moon from the Night Sky Network.

The entire newsletter is littered with great astrophotography including some from our own contributors!

SWFAS Table of Contents

Monthly Meetings

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

This month's meeting will be a combined live and Zoom meeting! Masks are optional.

Each meeting will have the same link/meeting ID (see below).

So, mark your calendar for:

August 4, 2022
Sept. 1, 2022
Oct. 6, 2022

For instructions on how to use Zoom to access our meetings, click here. The actual link is below.

https://widener.zoom.us/j/96535769204

Meeting ID: 965 3576 9204

One tap mobile:
+13126266799,,96535769204#
(or)
+16465588656,,96535769204#

Observing Program Dates Announced

Below are the schedules for our Friday public nights at the FSW Observatory (3rd Friday of the month) and the Saturday Solar Observing events (1st Saturday of the month) at county parks.

FSW Observatory
9-16-22
10-21-22
11-18-22
12-16-22
1-20-23
2-17-23
3-17-23
4-21-23
5-19-23

Solar Observing/Park
10-1-22 / Ponce deLeon
11-5-22 / Bayshore Live Oak
12-3-22 / Gilchrist
1-7-23 / Ponce deLeon
2-4-23 / Bayshore Live Oak
3-4-23 / Gilchrist
4-1-23 / Ponce deLeon
5-6-23 / Bayshore Live Oak

President's Report

Brian Risley - SWFAS President

Welcome to the start of Meteor season. We have several showers going the last few days of July (under dark skies) and the Perseids are starting. Unfortunately, the Perseid peak will coincide with the full moon. Many of our other showers this fall will also have the moon interfering. The summer Milky Way is making an appearance to be followed by the planets later this summer/fall.

I know this is only August, but we really need people to start thinking about the officer elections coming in December. I have been at this job since 2011. Mike McCauley has been busy with CNCP among other things recently. I would like to find those who are interested in helping run this organization so that there can be a smooth transition to new blood. Those who may be interested, please contact me, I can fill you in on what is expected of the different jobs. To give you an idea, I have been equipment coordinator for longer than being president and I have also been coordinating all the Lee County public events and star parties. These are jobs (along with a Night Sky Network Coordinator) that can be handled by multiple people. We have a committee that is working on programs. I really don't want to come to the December meeting without some new blood interested in starting to fill positions.

We are coming into the public event time frame this fall and having others involved in the planning for these events would be a good learning experience. We can also use people at these events that won't require any major commitments. Events we have usually done: International Observe the Moon Night, Ding Darling Days, Cape Coral Jaycees Fall Festival, North Fort Myers/Lee Parks and Rec Fall Festival, STEMtastic, Burrowing Owl Festival, Rotary Park Star Party, Big Cypress Observing Nights and other events as requested such as Cubs Scouts, Girl Scouts, school events etc.

Tom Segur and crew have done a great job with the FSW observing nights and Charlotte County park solar observing. His new schedules are here in the newsletter. If interested in helping them out, contact Tom.

Club Officers & Positions

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Thomas Segur
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Newsletter/Website
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Club Historian
Danny Secary
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Calusa Nature Center Planetarium Director Heather Preston
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239-275-3435

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 benefit s 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 June 2022 Quarterly Reflector magazine on around June 6, You can also directly access copies 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)
The Astronomical League Urban Observing Program

Over the last two months we highlighted the Messier and Caldwell List Observing programs which cover some of the best objects available for amateurs to observe in the night sky. These programs include many targets requiring darker skies.

This month we'll discuss the Urban Observing Program which is specifically designed to offer a challenge to observe 100 objects in light polluted skies. To gain the award, all observations must be made from light polluted sites and observations made from dark sky sites are not allowed! The definition of a light polluted sky is one from which the Milky Way is not visible to the naked eye. This corresponds to a Bortle Scale of 5 or higher on the cleardarksky chart.


Comet C/2017 K2 (PANSTARRS) & M10
Ray Bratton - July 14, 2022 - Addison, IL
ES127 FCD Triplet, ASI294 MC Pro,
ASIAIR Plus, 120G; 5 exp of 120s, 10min, 0°C,
UHC Filter, APP & PS RAW

Urban Observing Program

Two lists are provided. The first

includes 87 dark sky objects including Open Clusters, Globular Clusters, Planetary Nebulas, and Galaxies. Forty-one of these objects are on the Messier List. All objects are listed in Right Ascension order so that you can view them as they rise in the East and set in the West. Information provided on each deep-sky object includes: Catalog Number, Right Ascension, Declination, Magnitude, Messier Designation (if any), Type of Object, Size, Constellation, and what chart it is located on in both the Uranometria or Sky Atlas 2000.The second list includes 12 Double Stars and the variable star Algol. Observations and magnitude estimates of Algol are required both at a minimum and any non-minimum night. The recommended minimum size scope aperture is 6 inches. Scopes between 6 and 10 inches aperture were used to validate the lists.

Included on the website for this program is a useful and detailed set of Tips for Observing in a Light Polluted area. This covers optimum times (following store closures, etc.), sky and weather conditions, tips for shielding stray light, filters, and so forth. Setting circles are permitted although star-hopping with finders and Telrads is the preferred method for locating objects.

M16 Eagle Nebula (Pillars of Creation)
Ray Bratton - Addison, IL - 6/22/2022
ES127 FCD Triplet, 3X, ASI294MC Pro,
ASIAIR Plus, 60 120s exp, (2 hours),
UHC filter, APP & PS RAW

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!

Artemis 1: A Trip Around the Moon – and Back!

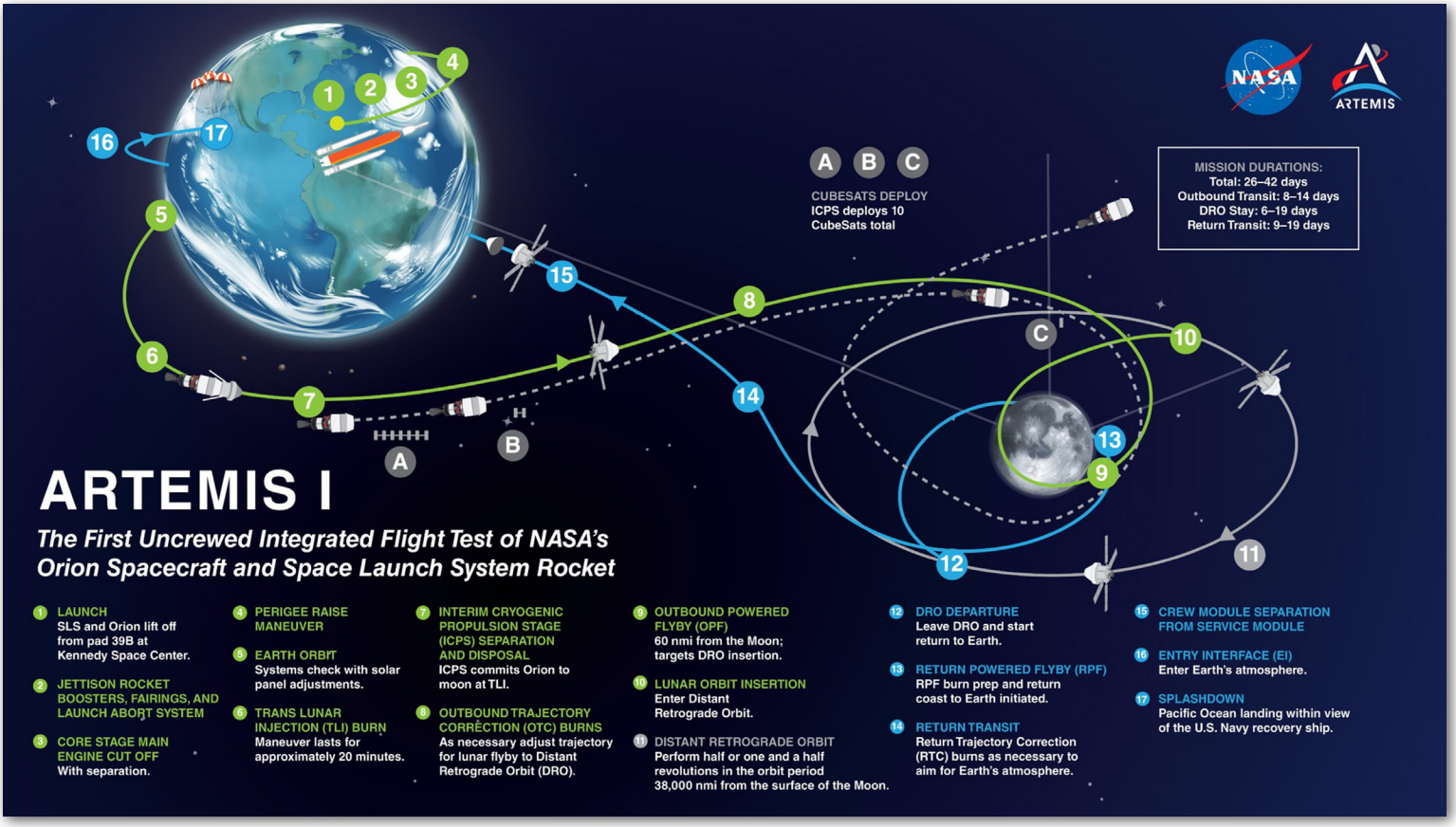
David Prosper

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

We are returning to the Moon - and beyond! Later this summer, NASA's Artemis 1 mission will launch the first uncrewed flight test of both the Space Launch System (SLS) and Orion spacecraft on a multi-week mission. Orion will journey thousands of miles beyond the Moon, briefly entering a retrograde lunar orbit before heading back to a splashdown on Earth.

The massive rocket will launch from Launch Complex 39B at the Kennedy Space Center in Florida. The location's technical capabilities, along with its storied history, mark it as a perfect spot to launch our return to the Moon. The complex's first mission was Apollo 10 in 1968, which appropriately also served as a test for a heavy-lift launch vehicle (the Saturn V rocket) and lunar spacecraft: the Apollo Command and Service Modules joined with the Lunar Module. The Apollo 10 mission profile included testing the Lunar Module while in orbit around the Moon before returning to the Earth. In its "Block-1" configuration, Artemis 1's SLS rocket will take off with 8.8 million pounds of maximum thrust, even greater than the 7.6 millions pounds of thrust generated by the legendary Saturn V, making it the most powerful rocket in the world!

Artemis 1 will serve not only as a test



of the SLS and the Orion hardware, but also as a test of the integration of ground systems and support personnel that will ensure the success of this and future Artemis missions. While uncrewed, Artemis-1 will still have passengers of a sort: two human torso models designed to test radiation levels during the mission, and "Commander Moonikin Campos," a mannequin named by the public. The specialized mannequin will also monitor radiation levels, along with vibration and acceleration data from inside its mission uniform: the Orion Crew Survival Suit, the spacesuit that future Artemis astronauts will wear. The "Moonikin" is named after Arturo Campos, a NASA electrical engineer who played an essential role in bringing Apollo 13's crew back to Earth after a near-fatal disaster in space.

The mission also contains other valuable cargo for its journey around the Moon and back, including CubeSats, several space science badges from the Girl Scouts, and microchips etched with 30,000 names of workers who made the Artemis-1 mission possible. A total of 10 CubeSats will be deployed from the Orion Stage Adapter, the ring that connects the Orion spacecraft to the SLS, at several segments along the mission's path to the Moon. The power of SLS allows engineers to attach many secondary "ride-along" mission hardware like these CubeSats, whose various missions will study plasma propulsion, radiation effects on microorganisms, solar sails, Earth's radiation environment, space weather, and of course, missions to study the Moon and even the Orion spacecraft and its Interim Cryogenic Propulsion Stage (ICPS)!

If you want to explore more of the science and stories behind both our Moon and our history of lunar exploration, the Night Sky Network's Apollo 11 at 50 Toolkit covers a ton of regolith: bit.ly/nsnmoon! NASA also works with people and organizations around the world coordinating International Observe the Moon Night, with 2022's edition scheduled for Saturday, October 1: moon.nasa.gov/observe. Of course, you can follow the latest news and updates on Artemis 1 and our return to the Moon at nasa.gov/artemis-1

Photo credit: NASA/Cory Huston Source: https://www.nasa.gov/image-feature/a-full-moon-over-artemis/

Astrophotography (SIG)
Special Interest Group

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

REGULAR MEETINGS
Regular meetings are usually on the Third Tuesday of each month,
HOWEVER The next meeting is Tuesday July 26th at 6:30 due to a conflict.

https://us02web.zoom.us/j/81077794455?pwd=MHJVL2VvZGZRK3JyM-1d5QVJiZE1TUT09

Meeting ID: 810 7779 4455
Passcode: Phot@S!G

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.

We have a nice, diverse group with a wide range of skill sets and interests. Some DSLR/Mirrorless shooters mixed in with telescope shooters. Some use Star Trackers, some use goto mounts, some use laptops and some use a fun little unit called the ASIAIR (a small little computer inside a box about the size of a cell phone that connects to a tablet or smart phone).

On any given day or moment we can shoot an email out to the group and get suggestions and answers, how cool is that?

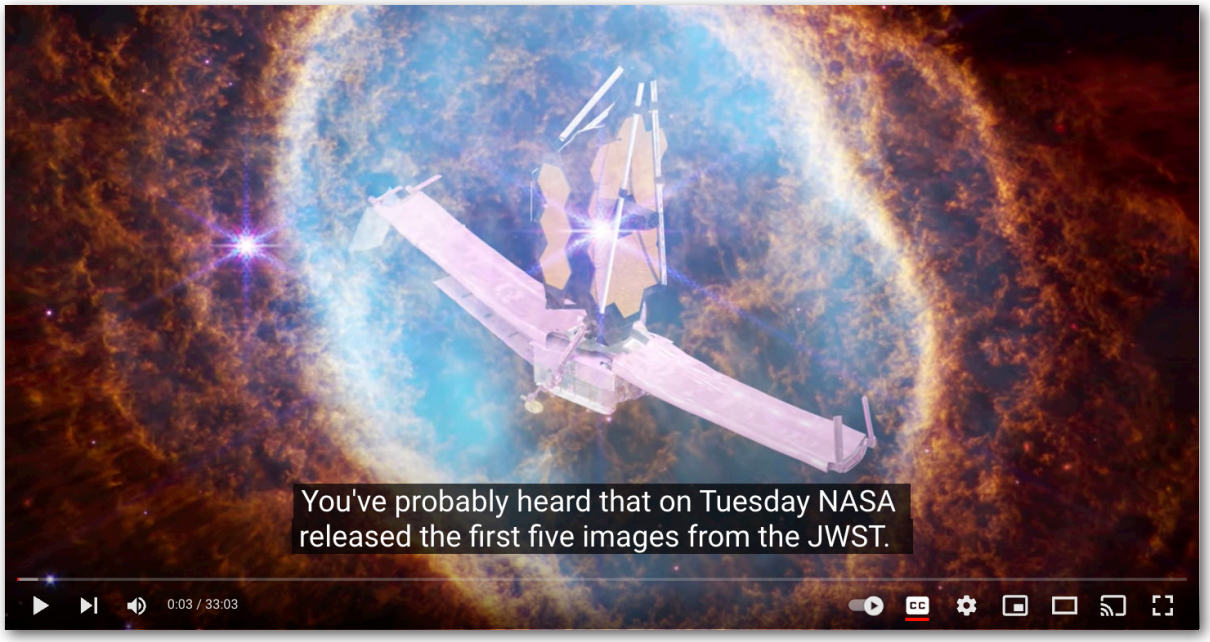
Now, the REALLY cool thing is that it looks like the pandemic is FINALLY starting to ease off so that means we can finally start getting together and be safe! That means more helping each other, more show and tell, more mentorship which is exactly why we created the Astro SIG.

So, if you want to learn Astrophotography (like Astro 101) with a LOT of fun people, join us.

Processing JWST Images Yourself

NASA made the image data from the JWST available to the public and we found a YouTuber who took on the task of processing this data to see if his was as good as NASA's.

Click on the image to the right to go to the YouTube tutorial.

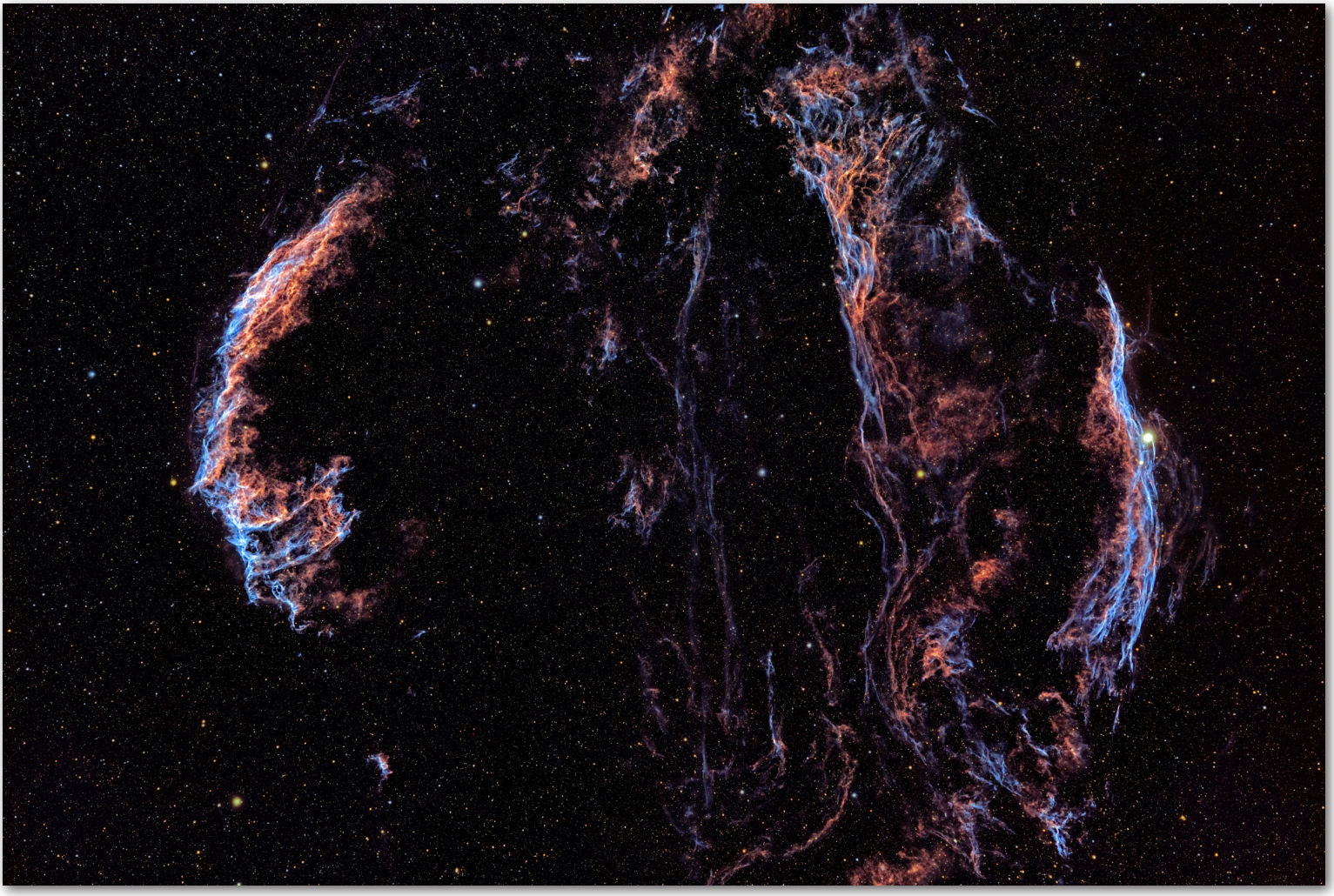


Astro SIG Images

Don Bishop - M8 & M20, the Lagoon and Trifid Nebulas.
M8 is a giant interstellar cloud in the constellation Sagittarius. It is classified as an emission nebula and as an H II region.

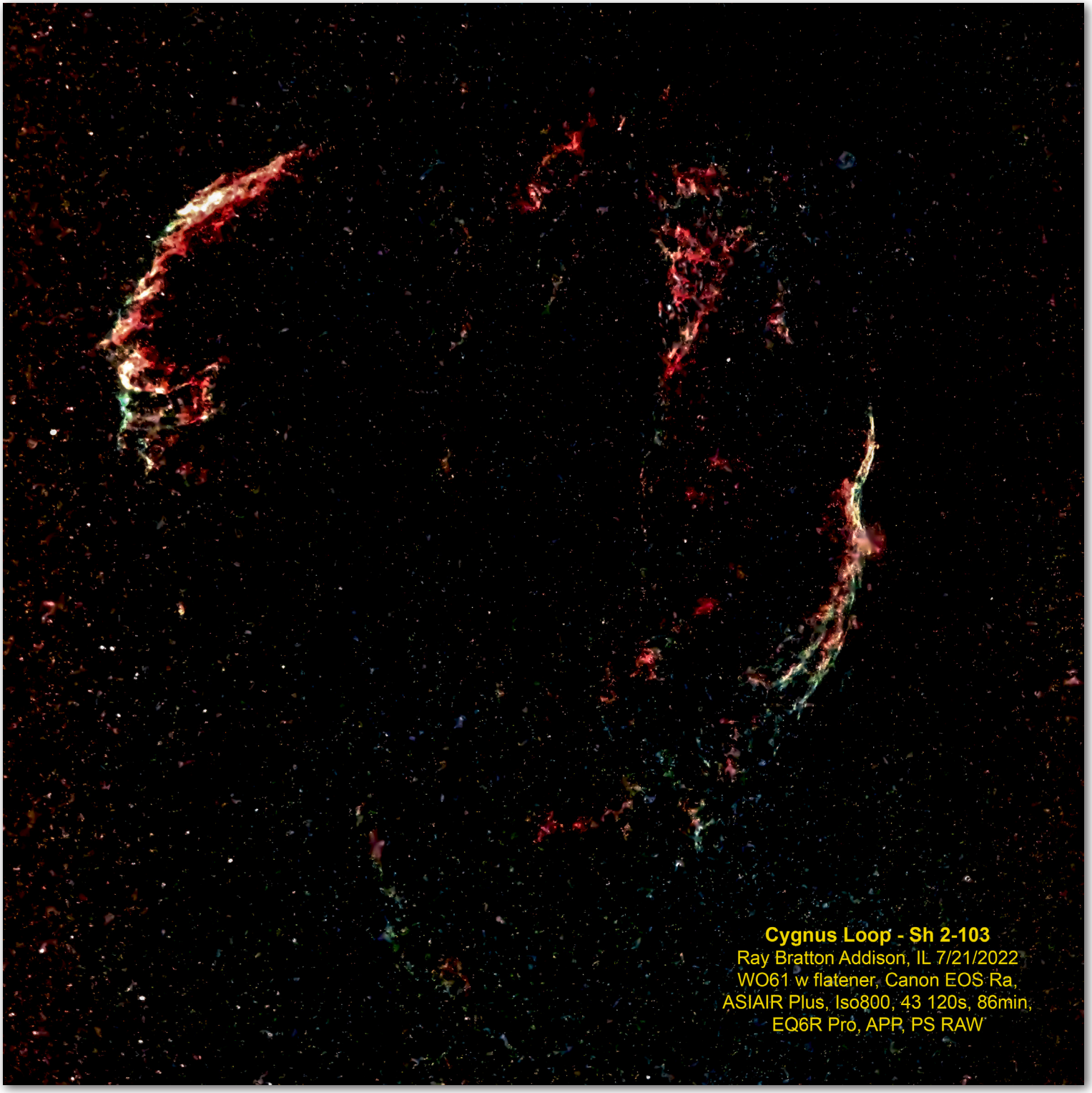
The Lagoon Nebula was discovered by Giovanni Hodierna before 1654[5] and is one of only two star-forming nebulae faintly visible to the eye from mid-northern latitudes. Seen with binoculars, it appears as a distinct cloud-like patch with a definite core. Within the nebula is the open cluster NGC 6530.

The Lagoon Nebula is estimated to be between 4,000–6,000 light-years away from the Earth. In the sky of Earth, it spans 90′ by 40′, which translates to an actual dimension of 110 by 50 light years. Like many nebulae, it appears pink in time-exposure color photos but is gray to the eye peering through binoculars or a telescope, human vision having poor color sensitivity at low light levels.



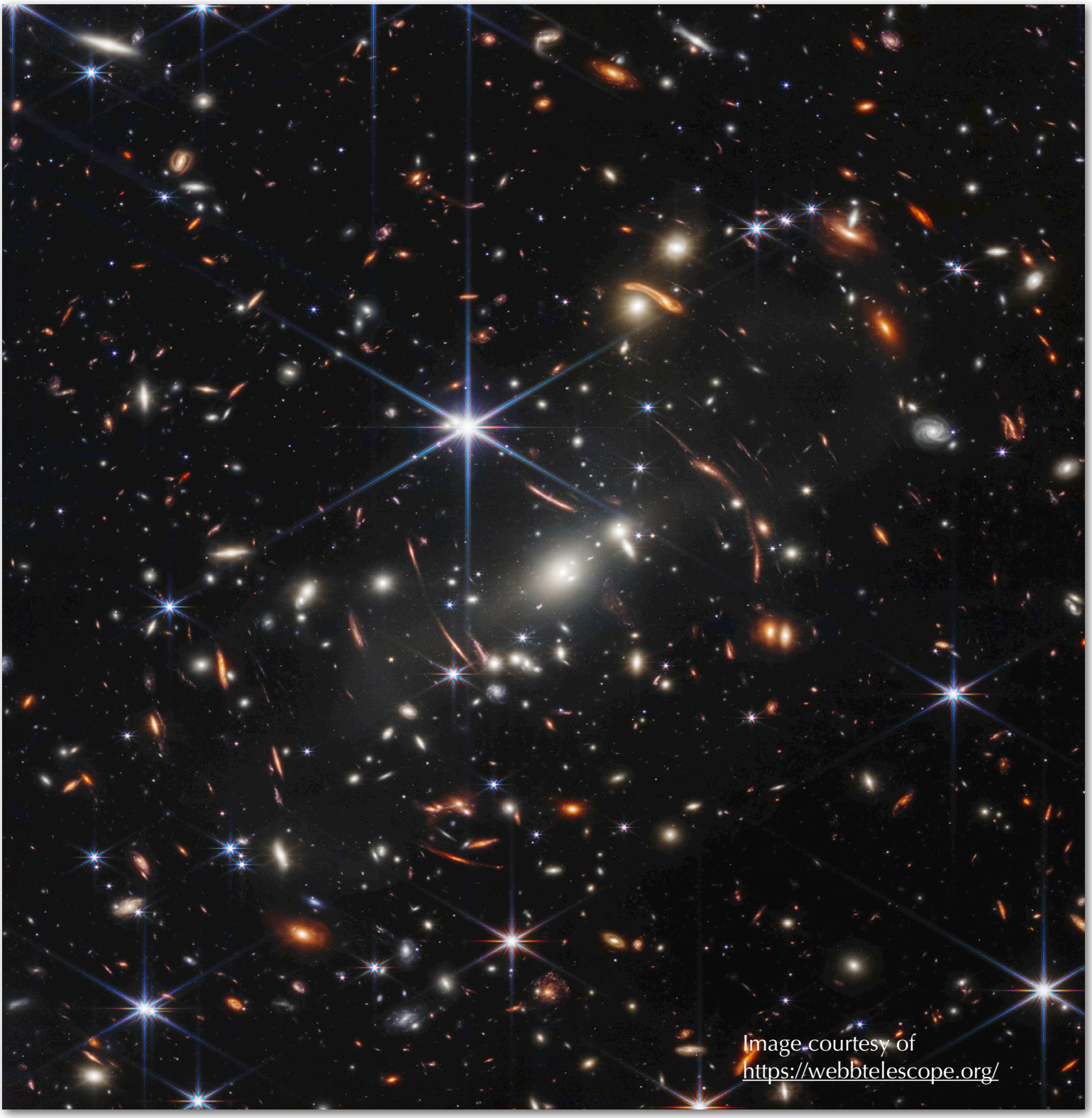
Linwood Ferguson - Cygnus Loop (East and West Veil)
East (left) and West Veil nebulae in the cygnus loop. This is a combination of RGB 240 second exposures (28 red, 36 green, 30 blue) and narrowband 300 second exposures (85 Ha, 66 Sii, 76 Oiii).
The RGB and Narrowband were separately used to form synthetic luminance, then the final stretched images were combined with only the stars from Rgb (which were combined with the square of the normalized value to de-emphasize them). This represents about 25.2 hours of data with a NP101is at F5.4, on a AP1100AE mount and ASI6200MM Pro.

The Cygnus Loop (radio source W78, or Sharpless 103) is a large supernova remnant (SNR) in the constellation Cygnus, an emission nebula measuring nearly 3° across. Some arcs of the loop, known collectively as the Veil Nebula or Cirrus Nebula, emit in the visible electromagnetic range. Radio, infrared, and X-ray images reveal the complete loop.



Cygnus Loop - Sh 2-103
Ray Bratton Addison, IL 7/21/2022
WO61 w flatener, Canon EOS Ra,
ASIAIR Plus, Iso800, 43 120s, 86min,
EQ6R Pro, APP, PS RAW

Webb Telescope First Images



If you held a grain of sand up to the sky at arm's length, that tiny speck is the size of Webb's view in this image. Imagine — galaxies galore within a grain, including light from galaxies that traveled billions of years to us! Why do some of the galaxies in this image appear bent? The combined mass of this galaxy cluster acts as a "gravitational lens," bending light rays from more distant galaxies behind it, magnifying them. Webb was able to capture this image in less than one day, while similar deep field images from Hubble can take multiple weeks

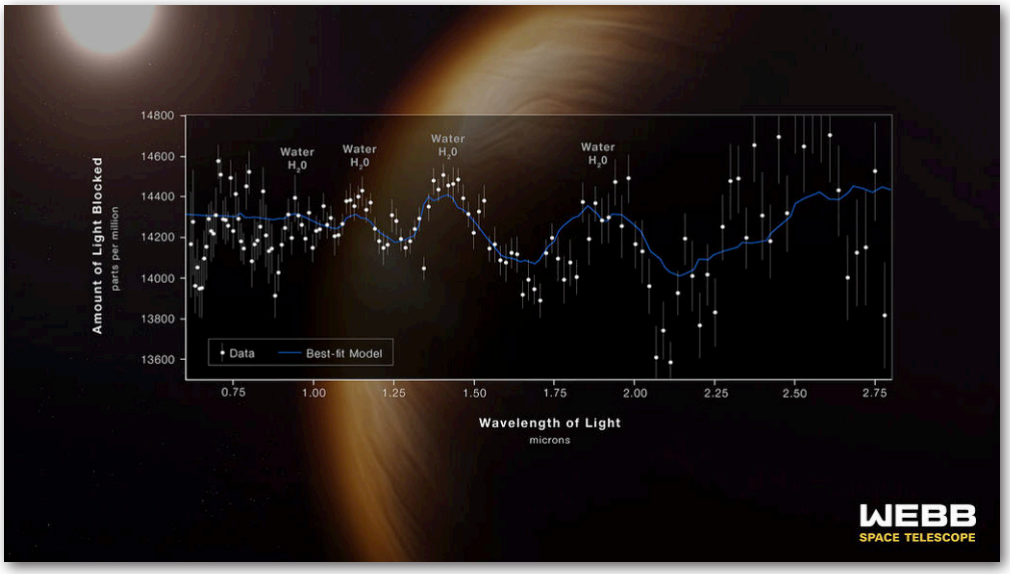
Webb Kicks Off a New Era in Astronomy

The dawn of a new era of astronomy is here . . . and our James Webb Space Telescope is just getting started.

The world got its first look at the full capabilities of the telescope, an international collaboration between NASA, the European Space Agency, and the Canadian Space Agency, when the full set of its first full-color images and spectroscopic data were unveiled during a live broadcast on Tuesday, July 12.

See the first images from the biggest, most powerful space telescope ever made:

Webb's First Deep Field – Webb has produced the deepest and sharpest infrared image of the distant universe to date. This image shows the galaxy cluster SMACS 0723 as it appeared 4.6 billion years ago, with many more galaxies in front of and behind the cluster. This slice of the vast universe covers a patch of sky approximately the size of a grain of sand held at arm's length by someone on the ground.



Steamy Atmosphere – Webb captured the distinct signature of water, along with evidence for clouds and haze, in the atmosphere surrounding WASP-96 b. Observation of this hot, Jupiter-like exoplanet demonstrates Webb's ability to analyze atmospheres more than a thousand light-years away, marking a huge leap forward in the quest to characterize potentially habitable planets beyond Earth.

Last Performance of a Dying Star – NGC 3132, known informally as the Southern Ring Nebula, is a planetary nebula - clouds of gas and dust expelled by a dying low-mass star- about 2,500 light-years away. There are actually two stars at the center of this image. Webb has revealed for the first time that this nebula's dimmer star is cloaked in dust.

A Galactic Quintet – This enormous mosaic of Stephan's Quintet, a visual grouping of five galaxies, is Webb's largest image to date. Containing over 150 million pixels, the image shows never-before-seen details in this galaxy group – sparkling clusters of young stars, sweeping tails of gas, and huge shock waves as one of the galaxies, NGC 7318B, smashes through the cluster.

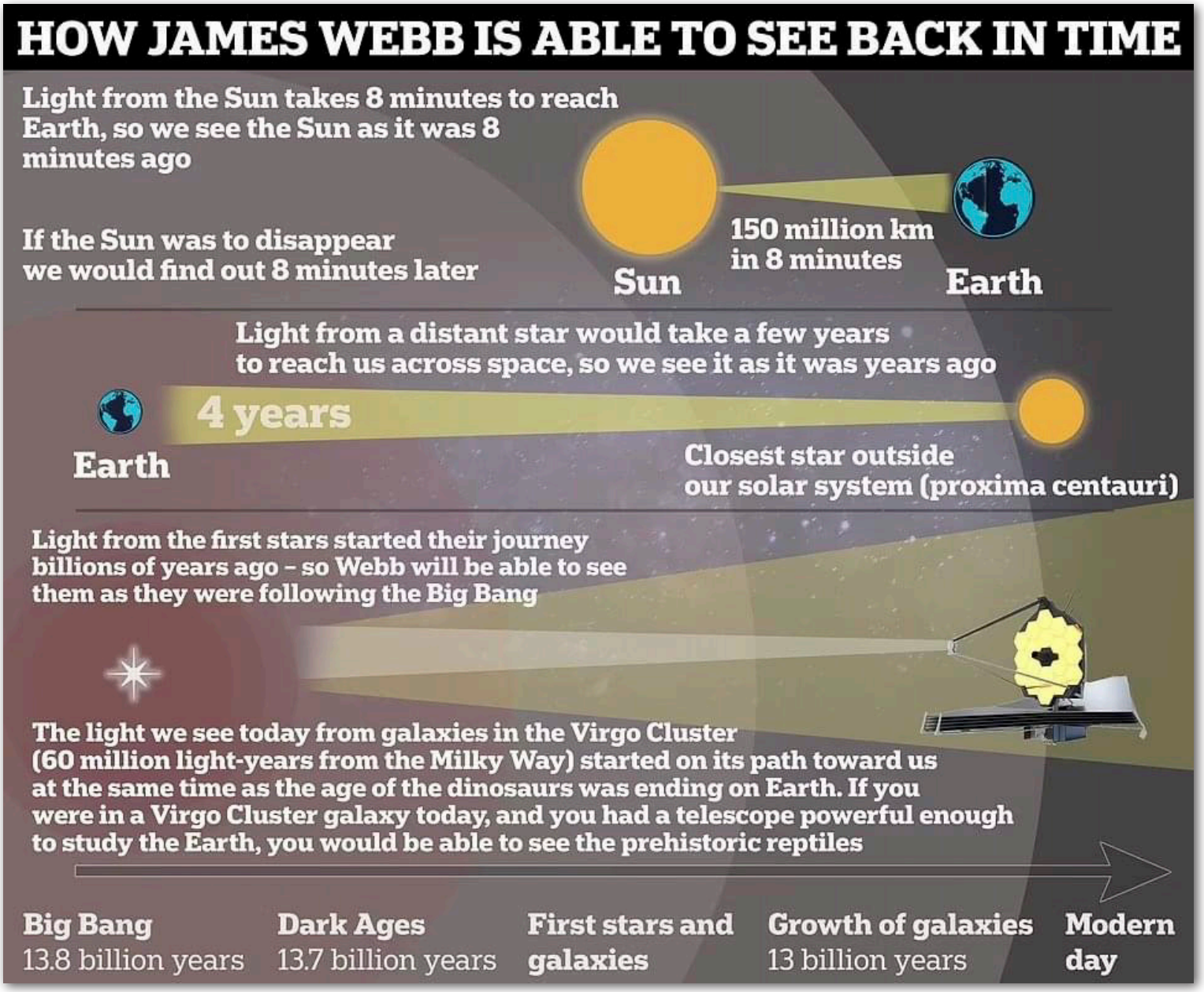
Cosmic Cliffs – This landscape of "mountains" and "valleys" speckled with glittering stars is actually the edge of a nearby, young, star-forming region called NGC 3324 in the Carina Nebula. Captured in infrared light, this image reveals for the first time previously invisible areas of star birth.

The release of these images kicks off the beginning of Webb's science operations. Astronomers around the world will use Webb to investigate everything from objects within our solar system to the early universe using Webb's four powerful instruments.

The telescope will unlock mysteries in our solar system, get new details about distant worlds orbiting other stars, and probe the mysterious structures and origins of our universe and our place in it.

Content provided by a NASA newsletter. Compiled by Mike Jensen

How The Webb Works



Looking back in time might sound like a strange concept, but it's what space researchers do every single day.

Our Universe is bound by the rules of physics, with one of the best-known 'rules' being the speed of light. And when we talk about 'light', we're actually referring to all the wavelengths across the electromagnetic spectrum, which travel at around a whopping 300,000 kilometers (about 186,400 miles) per second. Light travels so fast that in our everyday lives, it appears to be instantaneous. Even at these breakneck speeds, it still takes some time to travel anywhere across the cosmos.

When you look at the Moon, you actually see it as it was 1.3 seconds ago. It's only a tiny peek back in time, but it's still the past. It's the same with sunlight, except the photons (light particles) emitted from the Sun's surface travel just over 8 minutes before they finally reach Earth.

Our galaxy, the Milky Way, spans 100,000+ light-years. And the beautiful newborn stars seen in JWST's Carina

Nebula image are 7,500 light-years away.

In other words, this nebula as pictured is from a time roughly 2,000 years earlier than when the first ever writing is thought to have been invented in ancient Mesopotamia.

Any time we look away from the Earth, we're looking back in time to how things once were. This is a superpower for astronomers because we can use light, as observed throughout time, to try to puzzle together the mystery of our Universe.

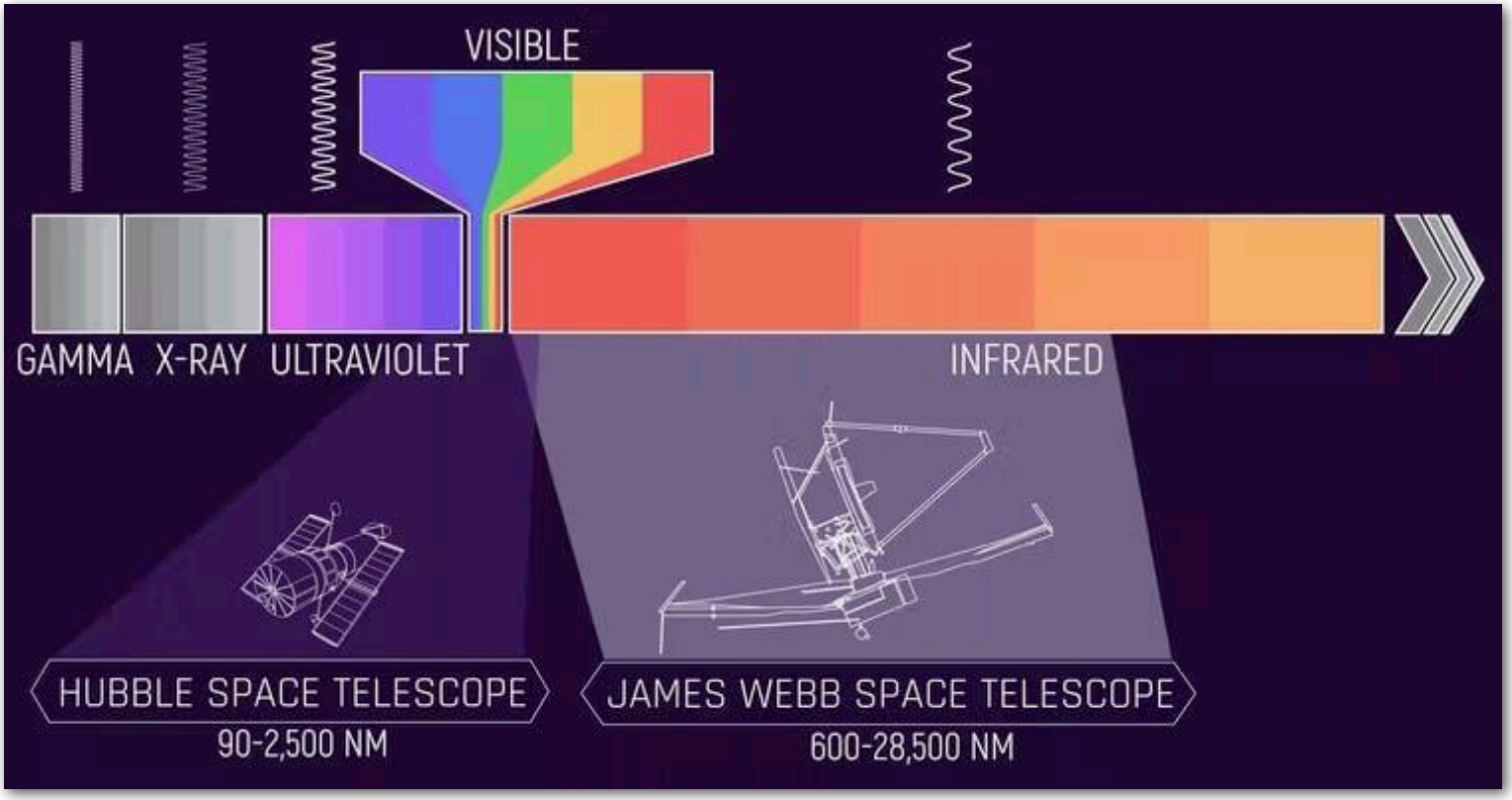
What makes JWST spectacular

Space-based telescopes let us see certain ranges of light that are unable to pass through Earth's dense atmosphere. The Hubble space telescope was designed and optimized to use both ultraviolet (UV) and visible parts of the electromagnetic spectrum.

The JWST was designed to use a broad range of infrared light. And this is a key reason the JWST can see further back in time than Hubble.

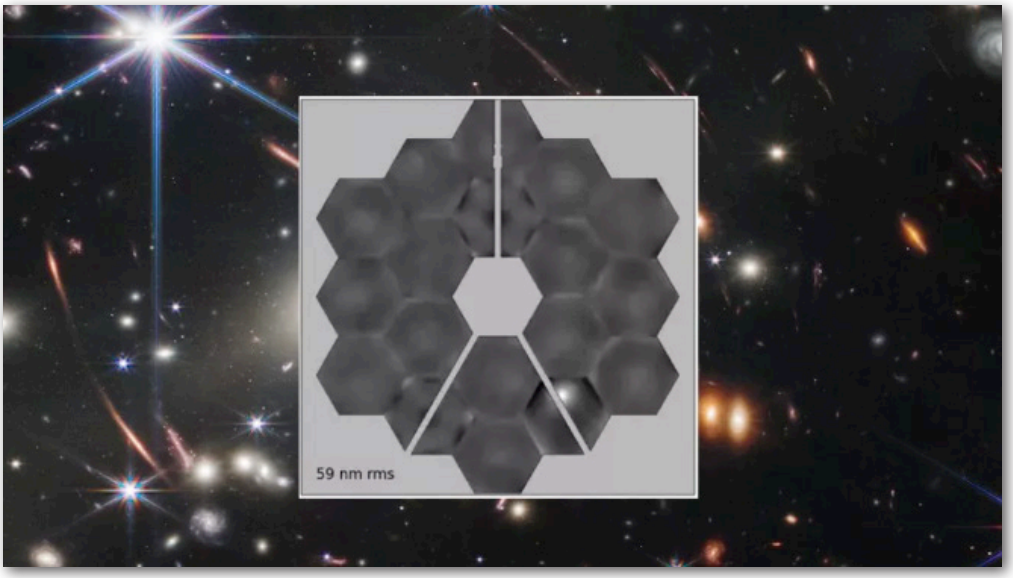
Below: The electromagnetic spectrum with Hubble and JWST's ranges. Hubble is optimized to see shorter wavelengths. These two telescopes complement each other, giving us a fuller picture of the Universe.

Galaxies emit a range of wavelengths on the electromagnetic spectrum, from gamma rays to radio waves and everything in between. All of these give us important information about the different physics occurring in a galaxy.



Webb Takes Meteor Hit

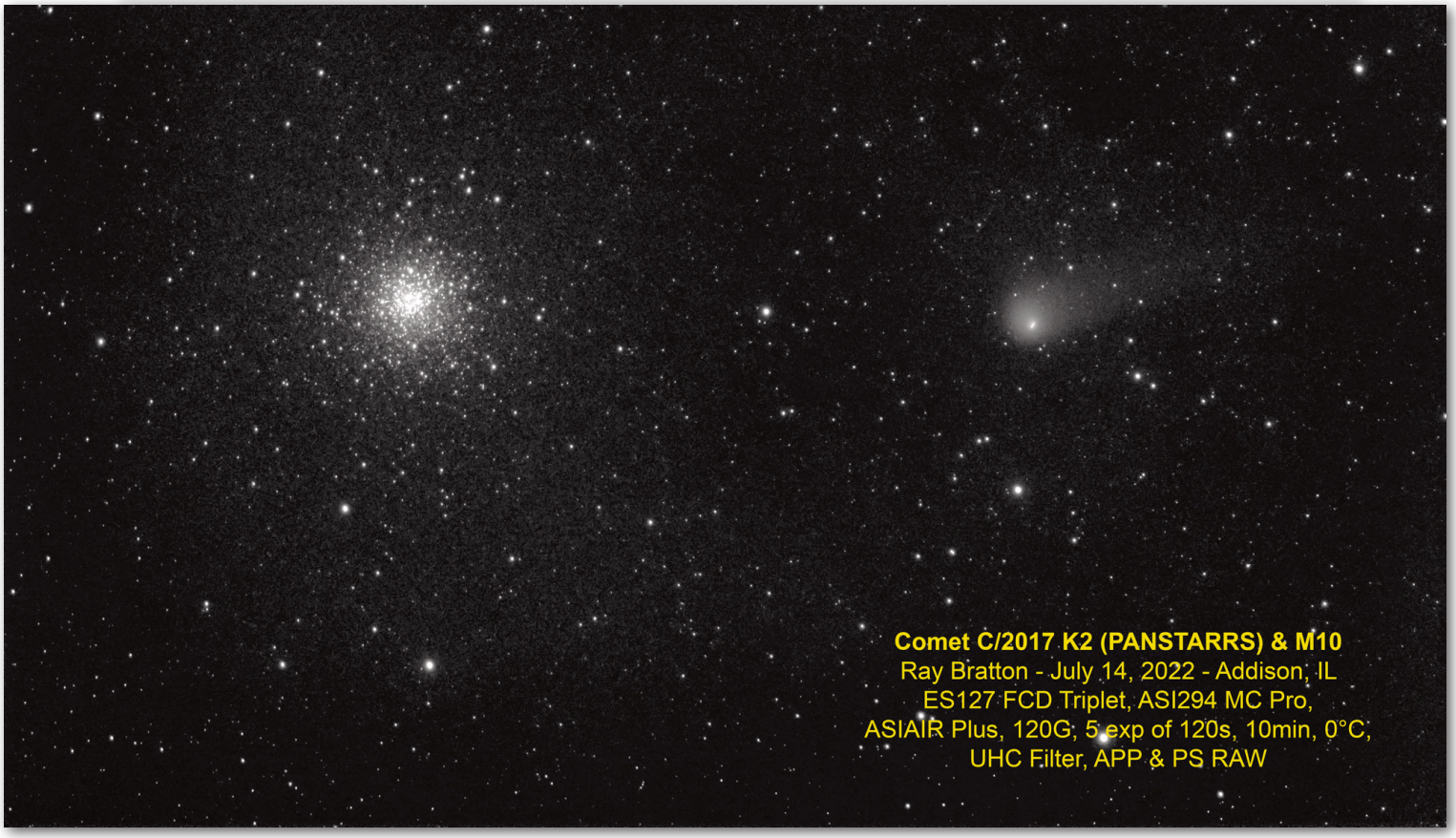
Source: https://www.livescience.com/james-webb-space-telescope-micrometeoroid-picture



Since launching on Dec. 25, 2021, NASA's James Webb Space Telescope (JWST) has been pelted by at least 19 tiny space rocks — including one large one that left noticeable damage on one of the telescope's 18 gold-plated mirrors.

In a sprawling new status report posted to the pre-print database arXiv.org(opens in new tab), NASA researchers have shared the first images showing the extent of that damage. Seen on the C3 mirror in the lower right-hand corner of the image, the impact site appears as a single bright white dent besmirching the golden mirror's surface.

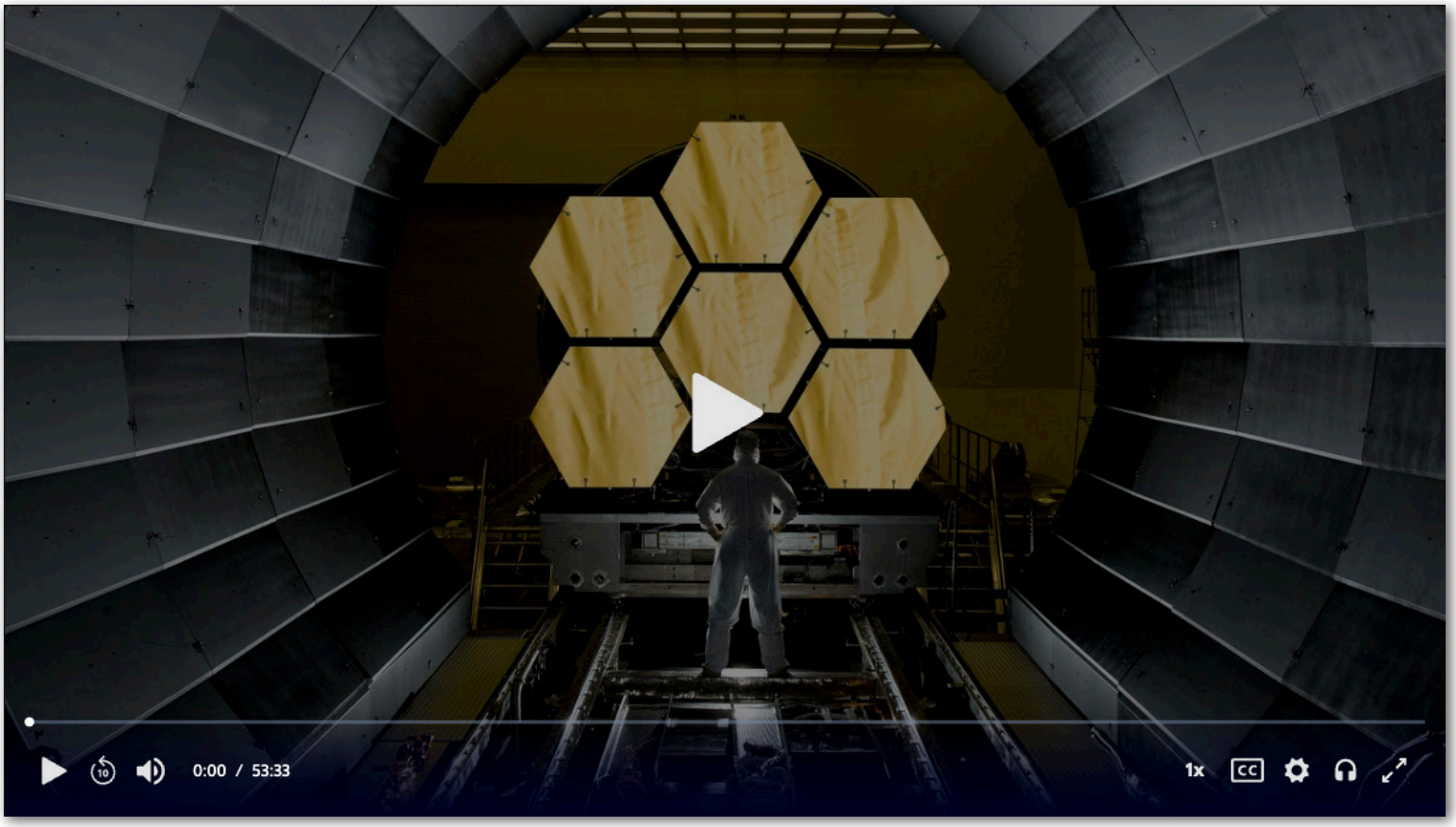
The impact — which likely occurred between May 23 and May 25 this year — left "uncorrectable" damage to a tiny portion of that mirror, the report says. However, this little dent doesn't seem to have inhibited the telescope's performance at all. In fact, the JWST's performance is exceeding expectations "almost all across the board." (Good news for fans of stunning space images.)



Comet C/2017 K2 (PANSTARRS) & M10
Ray Bratton - July 14, 2022 - Addison, IL
ES127 FCD Triplet, ASI294 MC Pro,
ASIAIR Plus, 120G; 5 exp of 120s, 10min, 0°C;
UHC Filter, APP & PS RAW

Ultimate Space Telescope Video

Source: https://www.pbs.org/wgbh/nova/video/ultimate-space-telescope/



How did NASA engineers build and launch the most ambitious telescope of all time? Follow the dramatic story of the James Webb Space Telescope—the most complex machine ever launched into space. If it works, scientists believe that this new eye on the universe will peer deeper back in time and space than ever before to the birth of galaxies, and may even be able to "sniff" the atmospheres of exoplanets as we search for signs of life beyond Earth. But getting it to work is no easy task. The telescope is far bigger than its predecessor, the famous Hubble Space Telescope, and it needs to make its observations a million miles away from Earth—so there will be no chance to go out and fix it. That means there's no room for error; the most ambitious telescope ever built needs to work perfectly. Meet the engineers making it happen and join them on their high stakes journey

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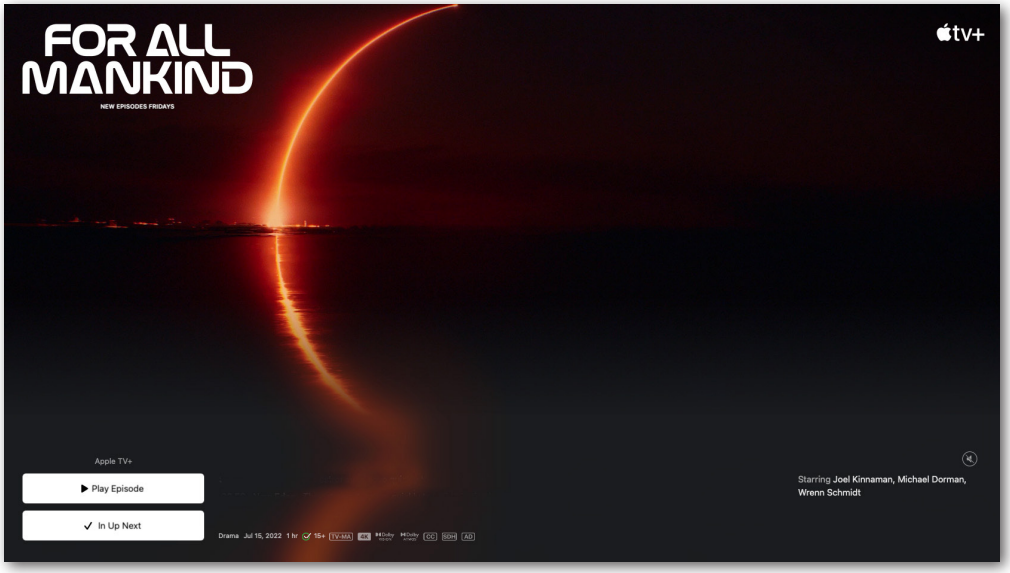
Editor's Note

This is a MUST SEE for not just the Astro SIG members but ANYONE who is an astronomy enthusiast. Work on the project began over 30 years ago at STScI (Space Telescope Science Institute) with a challenge from Institute Director Riccardo Giacconi to "think about the next major mission beyond Hubble." The development of a mission concept came in September 1989, with a workshop held at STScI, before Hubble was launched. Hundreds of people spent their entire career on the JWST.

This PDF document comes from the STSci newsletter and provides excellent detail and overview of the progression of the JWST project.

Mike's Guilty Space Pleasures

Almost everyone has that one or two movies or TV shows that they can watch over and over and never tire of. I've got several of course and I thought I'd let you know about some of them in case you're looking for something to keep yourself entertained during the Dog Days of Summer.



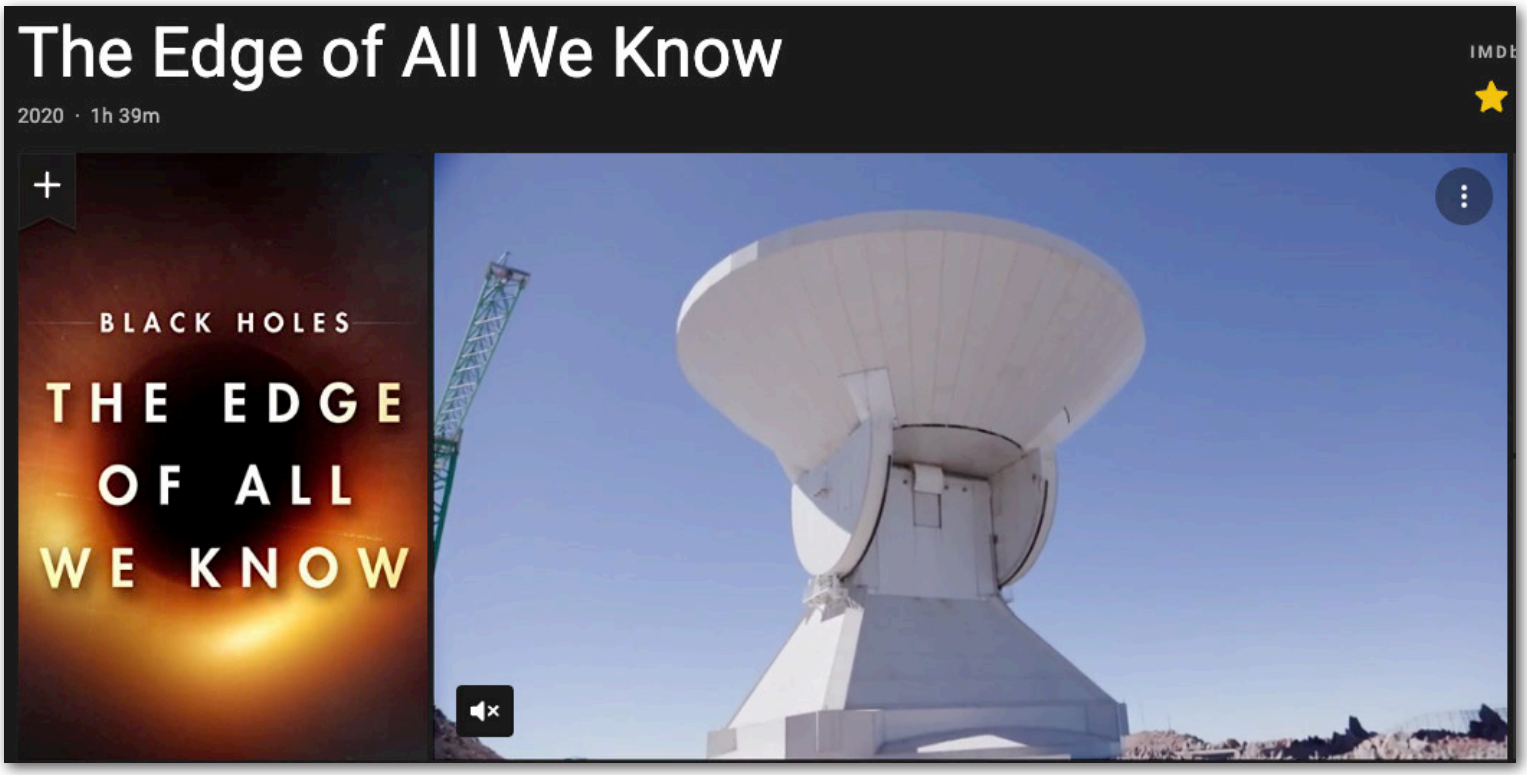
FOR ALL MANKIND - APPLE TV - I'll call this one Drama/Science Fiction, loosely based on actual events with a LOT of twists and turns.

I'm not usually one to tolerate changes to real life events, but they've actually done a pretty good job here. And (because it's in the first episode) I don't think I'm spoiling it too much by telling you the first twist is that Neil Armstrong was NOT the first man to walk on the moon.

This is one of those bingeworthy shows now in season 3. The characters grow on you and the plot is always moving along. Also, the job they've done on the technology/CGI (Computer Generated Imagery) blended with real life footage is amazing!

FROM THE EARTH TO THE MOON (1998) - HBO/HBO MAX - An inside look at the Apollo explorations (12 episodes) that saw man go to the moon in the 1960s and early 1970s. Plus how one millionaire funded his own trip to the moon.

You know it's a quality program when Tom Hanks, Ron Howard and Brian Grazer are involved. Largely based on Andrew Chaikin's 1994 book, A Man on the Moon, the series is known for its accurate telling of the story of Apollo and the special effects under visual director Ernest D. Farino. The series takes its title from, but is not based upon, the 1865 Jules Verne science fiction novel From the Earth to the Moon. Hanks narrates and appears in these scenes as Méliès' assistant. The miniseries has a fairly large cast, driven in part by the fact that it portrays 30 of the 32 astronauts who flew, or were preparing to fly, the twelve missions of the Apollo program. (The only two Apollo astronauts not portrayed by credited actors are Apollo 13 Command Module pilot Jack Swigert, who is heard but not seen in Episode 8, and Apollo 17 Command Module pilot Ronald Evans, who has a brief appearance in the liftoff scene of Apollo 17 in the final episode.) Members of many of the astronauts' families, and other NASA and non-NASA personnel, are also portrayed.



BLACK HOLES: THE EDGE OF ALL WE KNOW - NETFLIX - This is a 2020 documentary which began filming in 2016 when the Black Hole Initiative and the Event Horizon Telescope project started.

We follow some amazing physicists (including Stephan Hawking before he passed away in 2018) trying to figure out how to set up an array of telescopes positioned around the Earth to then act as one. The result is the announcement and display of the first images of black holes in M87 and in our own galaxy. See the June 2022 newsletter for more info.

Now I'll be honest, the physics of astronomy amazes me, and boggles my mind but to see them work through this, pull the data from five consecutive nights of imaging from nine different sites, then co-locate that data and then take some of the best mathematicians in the world to develop algorithms to extract these images is truly an incredible thing to watch.

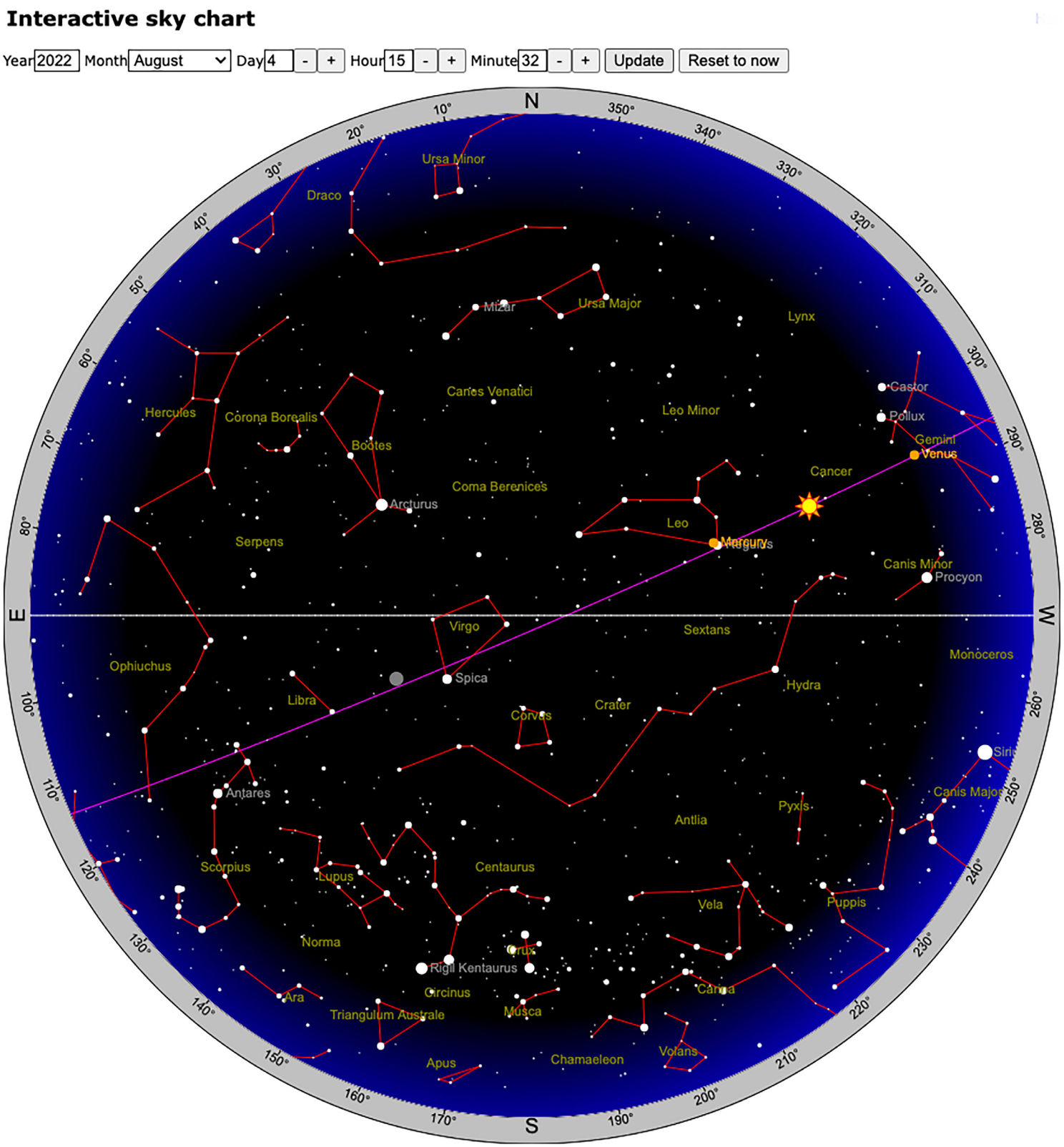
YouTube Video From Adam Block

Hubble Space Telescope and JWST Comparison of SMACS 0723

Here is a comparison of HST data with the same field as the newly released JWST image. Pretty remarkable what an 8m telescope in space can do! There is rumor this image is 1/10th the effective exposure time as the HST image.. but more research would be necessary. Also, there are differences in wavelength... but still cool to compare things.

Hubble Space Telescope and JWST Comparison of SMACS 0723

August 2022 Sky Chart



You can download or view this map better at: https://heavens-above.com/skychart2.aspx?lat=0&lng=0&loc=Unspecified&alt=0&tz=UCT

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 April 7th but can be programmed for any date and time. The chart can also be found at this link on Heavens Above.

Planet Summary

Year 2022 Month August Day 4 Time 15:34:42 Update Reset to now

	Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto
Right ascension	$10^h\ 11^m\ 5.9^s$	$7^h\ 30^m\ 55.0^s$	$3^h\ 12^m\ 26.9^s$	$0^h\ 32^m\ 53.8^s$	$21^h\ 40^m\ 29.0^s$	$3^h\ 4^m\ 21.9^s$	$23^h\ 42^m\ 42.4^s$	$19^h\ 56^m\ 35.2^s$
Declination	12° 24' 33"	21° 54' 32"	16° 10' 19"	1° 57' 28"	-15° 17' 4"	16° 57' 52"	-3° 11' 14"	-22° 56' 1"
Range (AU)	1.230	1.570	1.112	4.325	8.873	19.781	29.164	33.599
Elongation from Sun	18.4°	20.9°	81.9°	123.6°	169.5°	83.5°	137.2°	164.6°
Brightness	-0.3	-3.8	0.2	-2.5	0.3	5.8	7.8	14.3
Equatorial Diameter	5.47"	10.63"	8.42"	45.58"	18.73"	3.56"	2.34"	0.10"
Phase Angle	50.1°	30.2°	46.0°	9.8°	1.1°	2.9°	1.3°	0.4°
Constellation	Leo	Gemini	Aries	Cetus	Capricornus	Aries	Pisces	Sagittarius
Meridian transit	13:18	10:38	06:20	03:42	00:50	06:13	02:52	23:03
Rises	07:18	04:38	00:21	21:39	18:47	00:14	20:49	17:04
Sets	19:19	16:38	12:20	09:41	06:49	12:12	08:51	05:06
Altitude	54.0°	14.7°	-46.2°	-87.6°	-46.0°	-47.8°	-78.4°	-20.4°
Azimuth	291.4°	292.7°	293.7°	325.1°	112.3°	295.7°	106.0°	114.6°
Inferior Conjunction	2022-May-21 2022-Sep-23	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	2022-Jul-20 2023-Jul-22
Superior Conjunction	2022-Jul-16 2022-Nov-08	2021-Mar-26 2022-Oct-22	2021-Oct-08 2023-Nov-18	2022-Mar-05 2023-Apr-11	2022-Feb-04 2023-Feb-16	2022-May-05 2023-May-09	2022-Mar-13 2023-Mar-15	2022-Jan-16 2023-Jan-18
Max. eastern elongation	2022-Apr-29 2022-Aug-27	2021-Oct-29 2023-Jun-04	-	-	-	-	-	-
Max. western elongation	2022-Jun-16 2022-Oct-08	2022-Mar-20 2023-Oct-23	-	-	-	-	-	-
Perihelion	2022-Jul-10 2022-Oct-06	2022-Jan-23 2022-Sep-04	2022-Jun-21 2024-May-08	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	2022-May-27 2022-Aug-23	2022-May-15 2022-Dec-26	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

NEWBIE AND BEGINNER FACTS

1. The Sun, Moon, stars and planets all appear to slowly rise in the East and set in the West each day because the Earth rotates once around its axis every 24 hours.

2. The phases of the moon are caused by the relative position of the Sun, Earth and Moon. As the Moon orbits the Earth, we see all the phases cycle through once per 29 days: new, waxing crescent, waxing gibbous, full, waning gibbous, waning crescent, then new again. Waxing phases are visible in the afternoon and evening, waning phases are visible in the morning, and the full moon is visible all night long.

3. The Earth orbits the Sun once per year. As it does, the constant tilt of 23.5 degrees of the Earth's rotation axis causes the seasons in the Northern and Southern high latitudes.

4. The Sun and stars are the same kind of object: huge spheres of hot Hydrogen gas, radiating heat and light. The reason the Sun appears so bright is that it is much, much closer to the Earth than the other stars.

5. The Moon and planets in our Solar System are cool spheres like the Earth, physically much smaller than stars. They shine because of reflected sunlight.

6. The Solar System includes the Sun, 8 planets (including the Earth, but not including Pluto/Charon, which is classified as a large double asteroid), plus many moons, asteroids and comets. The Solar System is an extremely small portion of the Milky Way Galaxy, which is a giant collection of stars 100 million times larger than the Solar System in size. All the stars we see at night are part of the Milky Way Galaxy.

7. The Milky Way Galaxy is a spiral galaxy containing about 400 billion stars, including the Sun. It is one of many galaxies in the Universe. The universe is everything.

8. The Sun and Solar System, including the Earth, all formed from a collapsing cloud of gas 4.6 billion years ago. The cloud collapsed due to its own self-gravity. The fact that this cloud was initially rotating led to the orbits of the planets around the Sun, and the rotation of the Sun.

9. The universe and all the galaxies in it began in an explosion about 14 billion years ago. Galaxies are still receding from eachother as a result of the initial explosion, and we can detect radio waves which show direct evidence of the initial "Big Bang". These radio waves are called the Cosmic Microwave Background Radiation.

10. A black hole is an object so dense that the gravity forces at its surface prevent anything from escaping. Not even light can escape out through the surface of a black hole. The surface is called the event horizon.

Tulips Under The Milky Way by Mike Jensen

Taken in Woodburn, Oregon

This photo took 1st place in the Florida Camera Club Council Interpretive Photo Competition