



# the Skyscraper

vol. 48 no. 12  
December 2021

AMATEUR ASTRONOMICAL SOCIETY OF RHODE ISLAND \* 47 PEEPTOAD ROAD \* NORTH SCITUATE, RHODE ISLAND 02857 \* WWW.THESKYSCRAPERS.ORG

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## December Meeting

Saturday, December 11, 7:00pm via Zoom

### Meeting & Speaker

7:00 PM

Topic: "Signs of Life on Venus?"

Speaker: Dr. Sara Seager of MIT

For thousands of years, inspired by the star-filled dark night sky, people have wondered what lies beyond Earth. Today, the search for signs of life is a key factor in modern-day planetary exploration. Astronomers have found thousands of planets that orbit nearby stars, called "exoplanets".

Next-generation telescopes will enable us to study gases on rocky exoplanet atmospheres, including gases that might be attributed to life. Closer to home, astronomers have recently and unexpectedly detected phosphine gas on our sister planet Venus. Although now controversial, phosphine might possibly indicate the presence of life or may be explained by unknown, unusual chemistry. Professor Sara Seager, one of the world's leading experts on the search for signs of life beyond Earth, will share the growing number of new advances on Venus as a potentially habitable world.

Sara Seager is an astrophysicist and a professor of physics and planetary science at the Massachusetts Institute of Technology and is known for her pioneering research on exoplanets and their atmospheres. Her research has introduced many foundational ideas to the field of exoplanets, planets orbiting stars other than the sun. She is now at the forefront of the search for the first Earth-like exoplanets and signs of life on them and is pursuing exploration of Venus as a habitable world. For her research Professor Seager was awarded a MacArthur "genius" grant, and has asteroid [9729 Seager](#) named in her honor. Professor Seager is the author of [\*The Smallest Lights in the Universe: A Memoir\*](#).

### Notice: Change of venue

Unfortunately Sara Seager will not be able to speak to us in person at our December meeting due to a COVID quarantine. However she will speak to us vis Zoom. Members will be sent a link before the meeting time, or send email to [lbergemann@aol.com](mailto:lbergemann@aol.com) to be sent the Zoom link.

## New Members Welcome to Skyscrapers

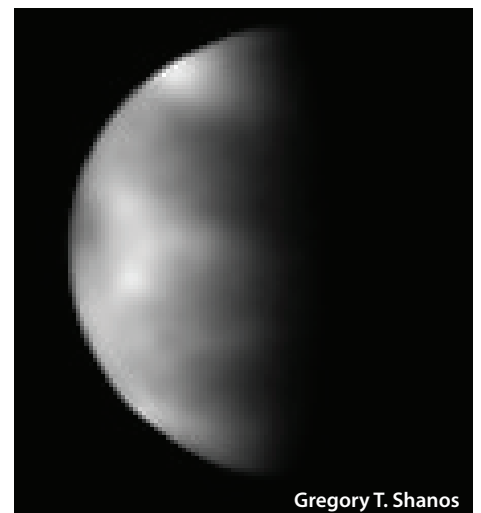
Jesus Contreras of  
Providence

Robert Galvin of  
Providence

Owen Herlihy of  
Providence

Joseph Zajac of Harvard,  
MA

Gregory T. Shanos



Gregory T. Shanos

# Skylights: December 2021

by Jim Hendrickson

The year's final month marks the transition into winter, with the season's most notable constellations rising into prominence during early evening hours, and, following solstice at 10:59am on the 21st, hours of darkness will begin to decrease.

If you recall using the position of the **Big Dipper** as a clock, note the position of its pointer stars at the 6 o'clock position relative to Polaris at 6 o'clock evening time at the beginning of the month. Twelve hours later, at 6am, they are directly above Polaris.

Early in the morning on the 2nd, step out to see the slender waning crescent Moon just  $0.5^\circ$  from the wide double star **Zubenelgenubi** in Libra. While you're taking in this beautiful sight, note that Mars is  $7^\circ$  below the pair.

New Moon occurs on the 3rd, and the waxing crescent visits our evening planets early in the month, being just  $3^\circ$  below Venus on the 6th,  $6^\circ$  below Saturn on the 7th, and passing within  $8^\circ$  of Jupiter on the 8th

and 9th.

The **Full Cold Moon** occurs on the 18th. December's full Moon is noteworthy for being the highest full Moon in the northern sky all year, as it resides in the same the area of the ecliptic that the Sun does during June solstice. This creates a surreal "night-time daylight" effect on your surroundings, especially if you can get away from lights. This is a great time for night hikes. The Moon transits the meridian at 11:42pm on the 18th, when it will be  $73.6^\circ$  in elevation. It is worth stepping out to enjoy December's Full Moon.

While you're looking at the full Moon, note its position in the **Winter Hexagon**, as it lies almost directly on the line between **Capella** and **Sirius**, with Orion directly below. The full Moon making its appearance in the Winter Hexagon is another indicator for the start of winter.

On its way to last quarter on the 26th, the Moon passes about  $2.5^\circ$  from the Bee-

hive Cluster, **M44**, on the morning of the 22nd.

December is the last month to view **Venus** in the evening sky. Having reached its greatest elongation late in October, Venus is now moving around the part of its orbit approaching Earth, resulting in its apparent position rapidly approaching the Sun. That makes this an interesting time to watch Venus, as its angular size and phase are changing rather quickly. Through small telescopes, or even large binoculars, it will show a beautiful crescent phase, which by the end of the month approaches one arcminute in angular size. That's about  $1/30$  the size of the Moon.

You'll also notice that Venus, which has been slowly catching up to **Saturn** and **Jupiter** over the past few months, will seem to have stopped, as it reaches its stationary point on the 18th, and begins to move retrograde as it approaches inferior conjunction early next month.

That leaves Saturn and Jupiter. The two giant planets have graced our evening skies for the past half year, but their best viewing opportunity is also nearing an end. Al-

## AstroAssembly Presentations on YouTube



With our monthly meetings going virtual, we have begun to record and publish, with permission, our monthly Zoom presentations on the Skyscrapers YouTube channel. Go to the URL below to view recent presentations.

<https://www.youtube.com/c/SeagraveObservatorySkyscrapersInc>



*The Skyscraper* is published monthly by Skyscrapers, Inc. Meetings are held monthly, usually on the first or second Friday or Saturday of the month. Seagrave Memorial Observatory is open every Saturday night, weather permitting.

### Directions

Directions to Seagrave Memorial Observatory are located on the back page of this newsletter.

### Submissions

Submissions to *The Skyscraper* are always welcome. Please submit items for the newsletter no later than **December 15** to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to jim@distantgalaxy.com.

### E-mail subscriptions

To receive *The Skyscraper* by e-mail, send e-mail with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.

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though they'll still be with us for a few more weeks, December is the last, best chance to get a good view of them with a telescope before they sink too low in the western sky.

Just as Venus is leaving our evening sky, **Mercury** is coming back. While it is in the evening sky all month, it is only far enough from the Sun to observe late in the month, and worth looking for beginning on the 26th, when Venus is nearby. Look for Mercury 6° directly below Venus on the 26th, and on the 28th, they pass within 4° of each other. A noteworthy conjunction, although it will be next to impossible to see low in twilight, the dwarf planet Pluto is just 3/4° from Mercury on the 29th and 30th.

**Neptune** is still in a favorable position for viewing early in the evenings through December, but it is setting rather quickly after Jupiter. It reaches its stationary point on the 2nd, and resumes its prograde motion thereafter. Use binoculars or a small telescope to locate Neptune 6° south of Kappa Piscium, the center-bottom star of the Circlet asterism of Pisces.

**Uranus** is our best-placed planet this month, as it is high on the meridian around

8pm local time. Located in southern Aries, about halfway between Hamal in Aries and Menkar in Pisces, you'll see a pair of objects of similar brightness about 0.5° apart. The top is the type F (white) main sequence star 29 Arietis, and the bottom, slightly dimmer, object is Uranus, which shines steadily with a blue-green hue. Note its position change with respect to 29 Ari on subsequent nights.

For the first time since July, **Mars** is now visible in a dark sky, as it is now visible in the morning sky just before twilight. While still rather dim and distant, you can track its motion from Libra into Scorpius as the month progresses, and note that it passes its "rival" Antares on the 28th, when the red giant heart of the Scorpion is just 4.5° to its lower right.

Dwarf planet **Ceres** is located in Taurus, and spends the month looping from the western edge of the Hyades cluster to a few degrees south of the Pleiades. Since this area is fun to explore in binoculars, don't forget to watch Ceres whenever you're enjoying these two star clusters..

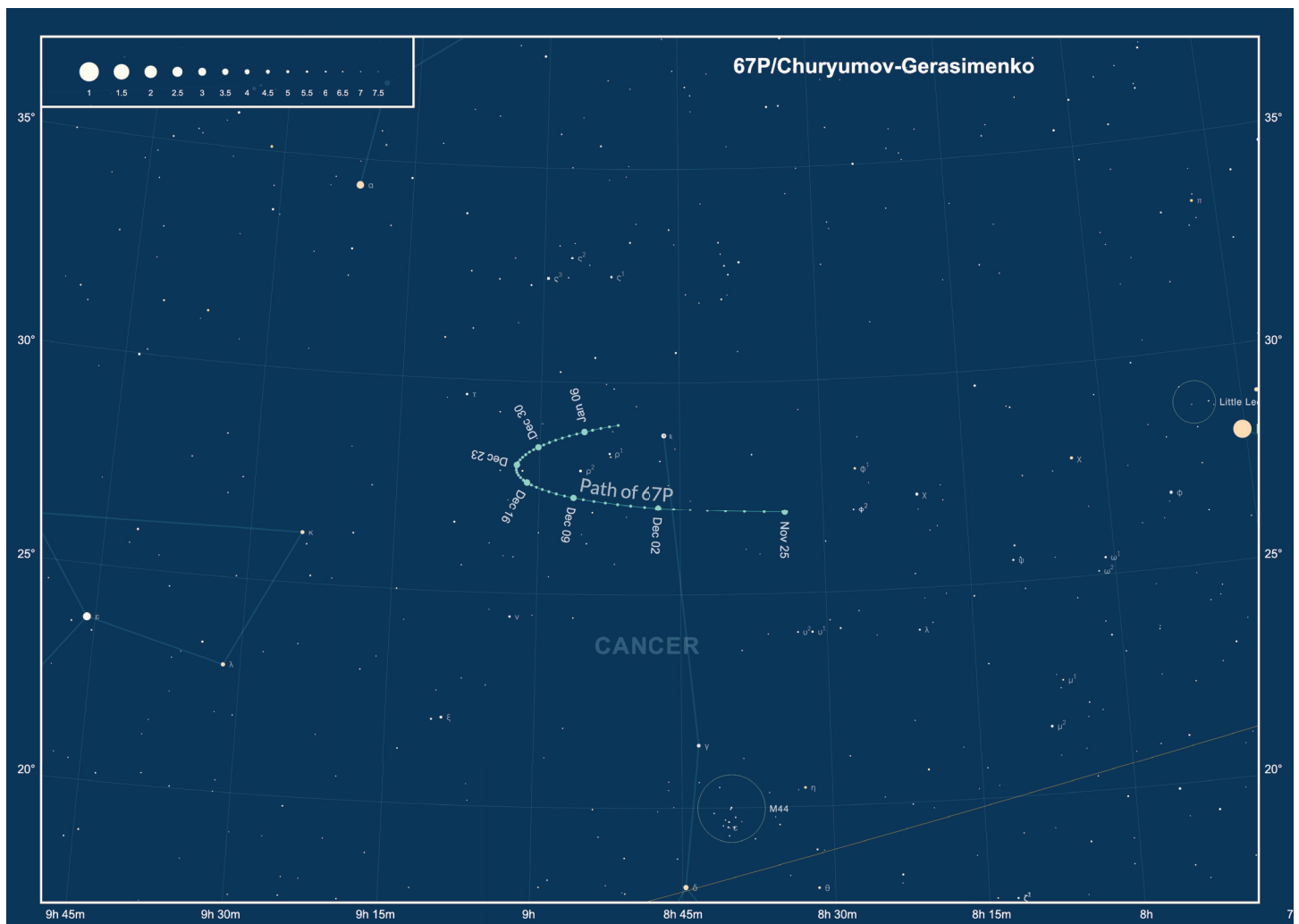
There are still two good comets visible in the December sky. **Comet 67P/Churyu-**

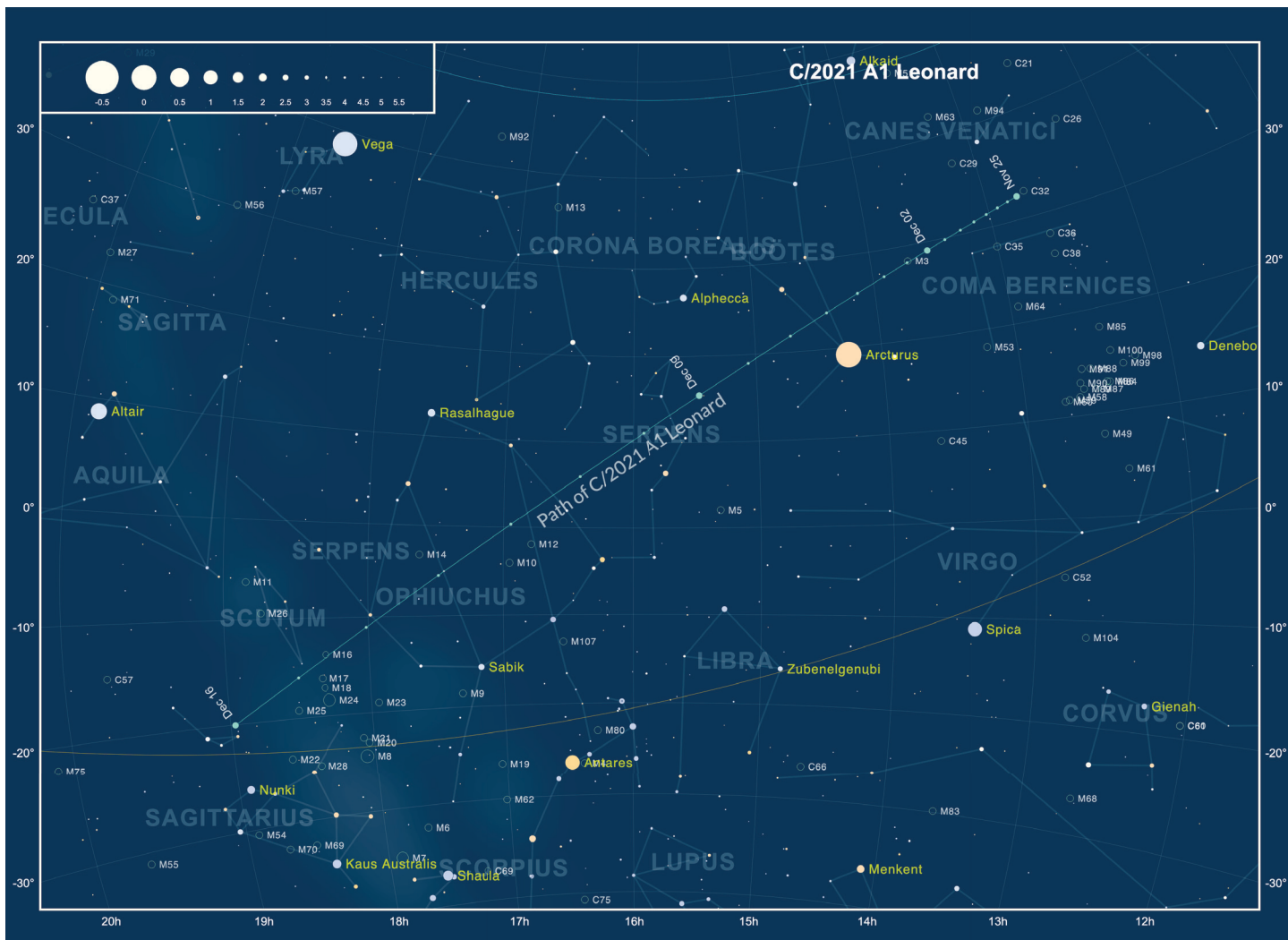
## Events in December

- 2 Moon & Zubenelgenubi (0.5°)
- 4 **New Moon**
- 4 Venus Greatest Illumination
- 6 Moon & Venus (3.2°)
- 7 Moon & Saturn (5.6°)
- 10 **First Quarter Moon**
- 10 Moon & Neptune (4.1°)
- 11 Venus & Pluto (0.1°)
- 15 Moon & Uranus (1.5°)
- 18 **Full Cold Moon**
- 21 **Solstice (10:59)**
- 22 Moon & M44 (2.7°)
- 23 Mars & M80 (1.6°)
- 23 Moon occults Eta Leonis
- 26 **Last Quarter Moon**
- 27 Mars & Antares (4.4°)
- 28 Mercury & Venus (4.2°)

Times in EDT (UTC-4) through Nov. 6 & EST (UTC-5) from Nov. 7. Ephemeris times are for Seagrave Observatory (41.845N, 71.590W)

**mov-Gerasimenko**, the comet which was visited by Rosetta and has the now defunct Philae lander on its surface, is looping





through Cancer, just over a binocular field north and slightly east of M44 in Cancer, and is expected to be around 9th magnitude.

**Comet C/2021 A1 Leonard** is visible in the morning sky during the first half of the month. It begins a few degrees east of

Arcturus, and moves southeast almost 4 degrees per day. By mid-month it will be located in Ophiuchus in twilight. It is predicted to brighten to as low as 6th magnitude.

The **Geminids**, perhaps the best meteor shower display of the year, peaks on the night of the 13th-14th. The meteors appear

to originate from an area of sky near Castor, which rises around 6pm. A waxing gibbous Moon could interfere with viewing, but the Geminids are known to produce a few bright meteors, which should still be visible.

## A Scorpion Tale

By Francine Jackson

This summer, it seems we've had a lot more rain, sometimes in torrents, but mainly it has left us rather quickly. Also, as the weather begins to change, we are losing both many pesky insects that bother us most summers, plus one of the most recognized constellations belonging to the summer season, Scorpion, the Scorpion.

Legend has Scorpion situated overhead in the warm weather as a form of respect for his ridding the world of the mighty hunter Orion, who believed he should rid the world of all the animals. It was the scorpion who put an end to Orion's dream. To

show how grateful the animals were, the giant scorpion was placed in the sky, virtually diametrically opposed to Orion. As such, Orion is not able to be seen until the scorpion, who languishes in summer's warm evenings, allows the hunter to move into the sky, in the cold winter nights.

Unfortunately, recently in Aswan, Egypt, rain and scorpions mixed. Violent thunderstorms rolled across southern Egypt, creating flooding, strong winds, hail . . . and hordes of venomous scorpions.

The continuous pouring rain drove poisonous scorpions out of their burrows, in

streets, and into homes. The animals then began a "stinging spree," especially when people, caught in power outages, found themselves stepping on the arachnids that had invaded their houses. Over 500 people were hospitalized.

This part of Africa is home to one of the most poisonous scorpions known, the Egyptian fat-tailed scorpion, but, fortunately, their venom is not lethal to humans. The victims were treated with doses of anti-venom and quickly released.

Fortunately, in our part of the world, Earthly scorpion sightings are virtually nonexistent. And, with Scorpion exiting the sky at this time, we are totally free of these nasty animals, at least until our summer sky returns.

# The Sun, Moon & Planets in December

This table contains the ephemeris of the objects in the Solar System for each Saturday night in November 2021. Times in Eastern Standard Time (UTC-5). Ephemeris times are for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
<b>Sun</b>	<b>4</b>	16 42.2	-22 14.0	Oph	-26.8	1947.1	-	-	-	0.99	06:57	11:36	16:15
	<b>11</b>	17 12.8	-22 59.8	Oph	-26.8	1949	-	-	-	0.98	07:03	11:39	16:15
	<b>18</b>	17 43.7	-23 23.2	Sgr	-26.8	1950.4	-	-	-	0.98	07:08	11:43	16:17
	<b>25</b>	18 14.8	-23 23.7	Sgr	-26.8	1951.3	-	-	-	0.98	07:12	11:46	16:21
<b>Moon</b>	<b>4</b>	16 19.4	-22 34.5	Sco	-5.8	1991	5° W	0	-	-	07:22	11:59	16:32
	<b>11</b>	23 24.3	-9 59.4	Aqr	-11.9	1877.2	89° E	49	-	-	12:42	18:33	00:34
	<b>18</b>	4 49.9	23 03.7	Tau	-12.5	1784.4	167° E	99	-	-	15:47	23:43	07:43
	<b>25</b>	10 49.2	12 33.7	Leo	-12.2	1822.2	115° W	71	-	-	21:37	04:36	11:23
<b>Mercury</b>	<b>4</b>	16 53.0	-23 44.8	Oph	-0.8	4.7	3° E	100	0.47	1.45	07:18	11:49	16:19
	<b>11</b>	17 41.0	-25 07.9	Oph	-0.7	4.7	7° E	98	0.46	1.42	07:45	12:09	16:34
	<b>18</b>	18 29.6	-25 23.9	Sgr	-0.6	4.9	11° E	95	0.44	1.36	08:07	12:30	16:54
	<b>25</b>	19 17.8	-24 27.2	Sgr	-0.6	5.3	14° E	90	0.40	1.27	08:22	12:51	17:20
<b>Venus</b>	<b>4</b>	19 37.6	-24 14.1	Sgr	-4.5	41.3	40° E	26	0.72	0.41	10:01	14:30	18:58
	<b>11</b>	19 49.6	-22 49.5	Sgr	-4.4	46.3	36° E	20	0.72	0.37	09:39	14:14	18:49
	<b>18</b>	19 54.2	-21 21.0	Sgr	-4.3	51.8	30° E	14	0.72	0.33	09:08	13:50	18:31
	<b>25</b>	19 50.5	-19 54.6	Sgr	-4.1	57.4	22° E	7	0.72	0.29	08:30	13:18	18:05
<b>Mars</b>	<b>4</b>	15 24.4	-18 28.9	Lib	1.6	3.8	19° W	99	1.57	2.47	05:24	10:17	15:10
	<b>11</b>	15 44.4	-19 41.8	Lib	1.6	3.8	21° W	99	1.56	2.44	05:22	10:10	14:58
	<b>18</b>	16 04.7	-20 46.8	Sco	1.6	3.9	23° W	98	1.55	2.41	05:19	10:03	14:46
	<b>25</b>	16 25.5	-21 43.1	Oph	1.6	3.9	25° W	98	1.55	2.38	05:16	09:56	14:35
<b>1 Ceres</b>	<b>4</b>	4 12.2	17 09.3	Tau	7.1	0.7	171° E	100	2.74	1.76	15:54	23:00	06:06
	<b>11</b>	4 05.4	17 19.3	Tau	7.3	0.7	163° E	100	2.73	1.78	15:19	22:26	05:33
	<b>18</b>	3 59.3	17 31.3	Tau	7.4	0.7	155° E	99	2.73	1.80	14:45	21:53	05:00
	<b>25</b>	3 54.2	17 45.8	Tau	7.6	0.7	147° E	99	2.72	1.85	14:11	21:20	04:29
<b>Jupiter</b>	<b>4</b>	21 53.6	-13 54.1	Cap	-2.1	38.0	74° E	99	5.00	5.18	11:33	16:44	21:56
	<b>11</b>	21 57.6	-13 32.1	Cap	-2.1	37.2	68° E	99	5.00	5.29	11:08	16:21	21:34
	<b>18</b>	22 02.0	-13 07.8	Aqr	-2.0	36.5	62° E	99	5.00	5.39	10:43	15:58	21:12
	<b>25</b>	22 06.8	-12 41.3	Aqr	-2.0	35.9	56° E	99	4.99	5.48	10:19	15:35	20:51
<b>Saturn</b>	<b>4</b>	20 47.5	-18 44.2	Cap	0.7	15.9	57° E	100	9.93	10.43	10:46	15:38	20:30
	<b>11</b>	20 49.9	-18 34.7	Cap	0.7	15.7	51° E	100	9.92	10.52	10:20	15:13	20:06
	<b>18</b>	20 52.6	-18 24.1	Cap	0.7	15.6	44° E	100	9.92	10.60	09:55	14:48	19:42
	<b>25</b>	20 55.4	-18 12.8	Cap	0.7	15.5	38° E	100	9.92	10.68	09:29	14:24	19:18
<b>Uranus</b>	<b>4</b>	2 37.4	14 56.0	Ari	5.7	3.7	150° E	100	19.73	18.87	14:29	21:27	04:24
	<b>11</b>	2 36.5	14 52.0	Ari	5.7	3.7	142° E	100	19.73	18.94	14:01	20:58	03:55
	<b>18</b>	2 35.8	14 48.6	Ari	5.7	3.7	135° E	100	19.72	19.02	13:33	20:30	03:27
	<b>25</b>	2 35.1	14 45.7	Ari	5.7	3.7	128° E	100	19.72	19.11	13:05	20:02	02:58
<b>Neptune</b>	<b>4</b>	23 26.5	-4 51.5	Aqr	7.9	2.3	98° E	100	29.92	29.76	12:32	18:16	00:01
	<b>11</b>	23 26.6	-4 50.7	Aqr	7.9	2.3	91° E	100	29.92	29.88	12:04	17:49	23:34
	<b>18</b>	23 26.8	-4 49.3	Aqr	7.9	2.3	84° E	100	29.92	30.00	11:37	17:22	23:07
	<b>25</b>	23 27.1	-4 47.2	Aqr	7.9	2.3	77° E	100	29.92	30.12	11:10	16:55	22:39
<b>Pluto</b>	<b>4</b>	19 49.6	-22 46.8	Sgr	14.4	0.2	43° E	100	34.42	35.13	10:06	14:40	19:15
	<b>11</b>	19 50.4	-22 45.1	Sgr	14.4	0.2	36° E	100	34.42	35.21	09:39	14:13	18:48
	<b>18</b>	19 51.2	-22 43.3	Sgr	14.4	0.2	29° E	100	34.43	35.28	09:12	13:47	18:21
	<b>25</b>	19 52.1	-22 41.4	Sgr	14.4	0.2	22° E	100	34.43	35.34	08:45	13:20	17:55

# The James Webb Space Telescope: Ready for Launch!

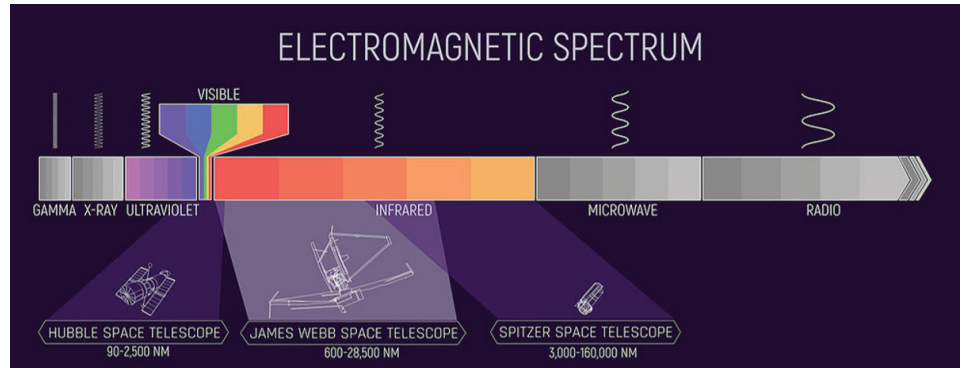
By David Prosper

NASA's James Webb Space Telescope is ready for lift-off! As of this writing (November 15), the much-anticipated next-generation space telescope is being carefully prepared for launch on December 18, 2021, and will begin its mission to investigate some of the deepest mysteries of our universe.

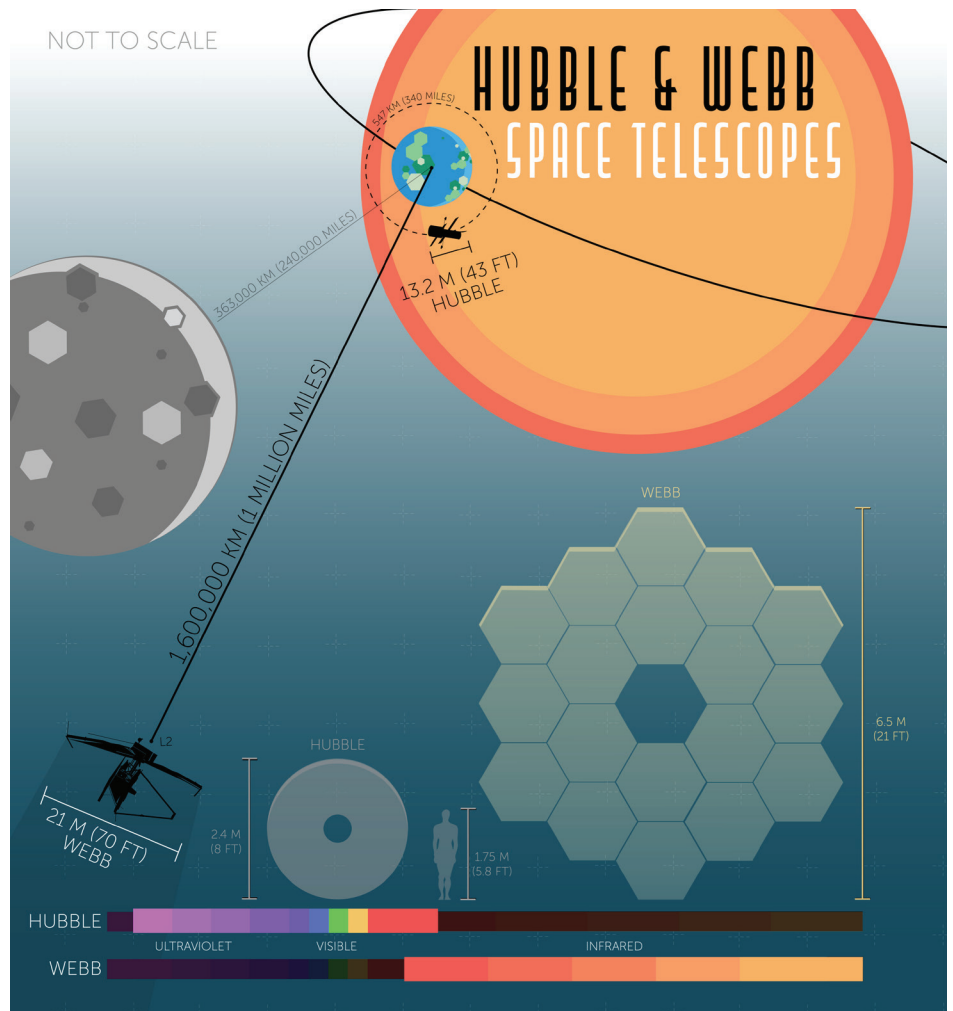
The development of the Webb began earlier than you might expect – the concept that would develop into Webb was proposed even before the launch of the Hubble in the late 1980s! Since then, its design underwent many refinements, and the telescope experienced a series of delays during construction and testing. While frustrating, the team needs to ensure that this extremely complex and advanced scientific instrument is successfully launched and deployed. The Webb team can't take any chances; unlike the Hubble, orbiting at an astronaut-serviceable 340 miles (347 km) above Earth, the Webb will orbit about one million miles away (or 1.6 million km), at Lagrange Point 2. Lagrange Points are special positions where the gravitational influence between two different bodies, like the Sun and Earth, “balance out,” allowing objects like space telescopes to be placed into stable long-term orbits, requiring only minor adjustments - saving Webb a good deal of fuel.

Since this position is also several times further than the Moon, Webb's sunshield will safely cover the Moon, Earth, and Sun and block any potential interference from their own infrared radiation. Even the seemingly small amount of heat from the surfaces of the Earth and Moon would interfere with Webb's extraordinarily sensitive infrared observations of our universe if left unblocked. More detailed information about Webb's orbit can be found at [bit.ly/webborbitinfo](https://bit.ly/webborbitinfo), and a video showing its movement at [bit.ly/webborbitvideo](https://bit.ly/webborbitvideo).

Once in its final position, its sunshield and mirror fully deployed and instruments checked out, Webb will begin observing! Webb's 21-foot segmented mirror will be trained on targets as fine and varied as planets, moons, and distant objects in our outer Solar System, active centers of galaxies, and some of the most distant stars and galaxies



Webb will observe a wide band of the infrared spectrum, including parts observed by the Hubble - which also observes in a bit of ultraviolet light as well as visible - and the recently retired Spitzer Space Telescope. Webb will even observe parts of the infrared spectrum not seen by either of these missions! Credits: NASA and J. Olmstead (STScI)



Webb will follow up on many of Hubble's observations and continue its mission to study the most distant galaxies and stars it can - and as you can see in this comparison, its mirror and orbit are both huge in comparison, in order to continue these studies in an even deeper fashion! Credits: NASA, J. Olmsted (STScI)

in our universe: objects that may be some of the first luminous objects formed after the Big Bang! Webb will join with other observatories to study black holes - including the one lurking in the center of our galaxy, and will study solar systems around other stars, including planetary atmospheres, to investigate their potential for hosting life.

Wondering how Webb's infrared obser-

vations can reveal what visible light cannot? The "Universe in a Different Light" Night Sky Network activity can help - find it at [bit.ly/different-light-nsn](https://bit.ly/different-light-nsn). Find the latest news from NASA and Webb team as it begins its mission by following #UnfoldTheUniverse on social media, and on the web at [nasa.gov/webb](https://nasa.gov/webb).

[nasa.gov/webb](https://nasa.gov/webb).



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

## Lenticular Galaxy in Pegasus: NGC 16

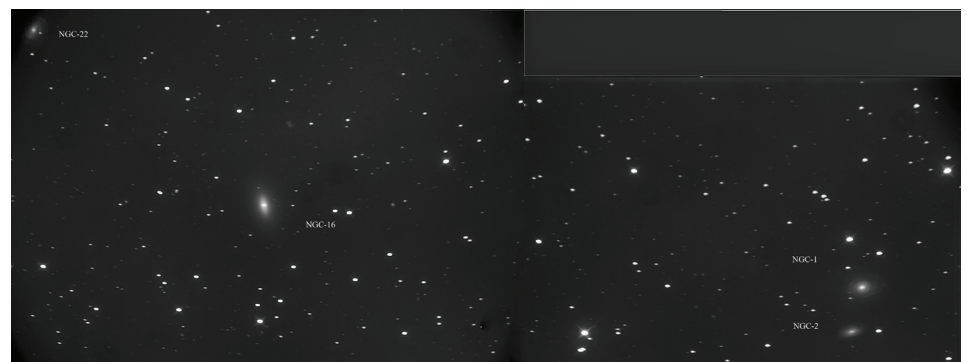
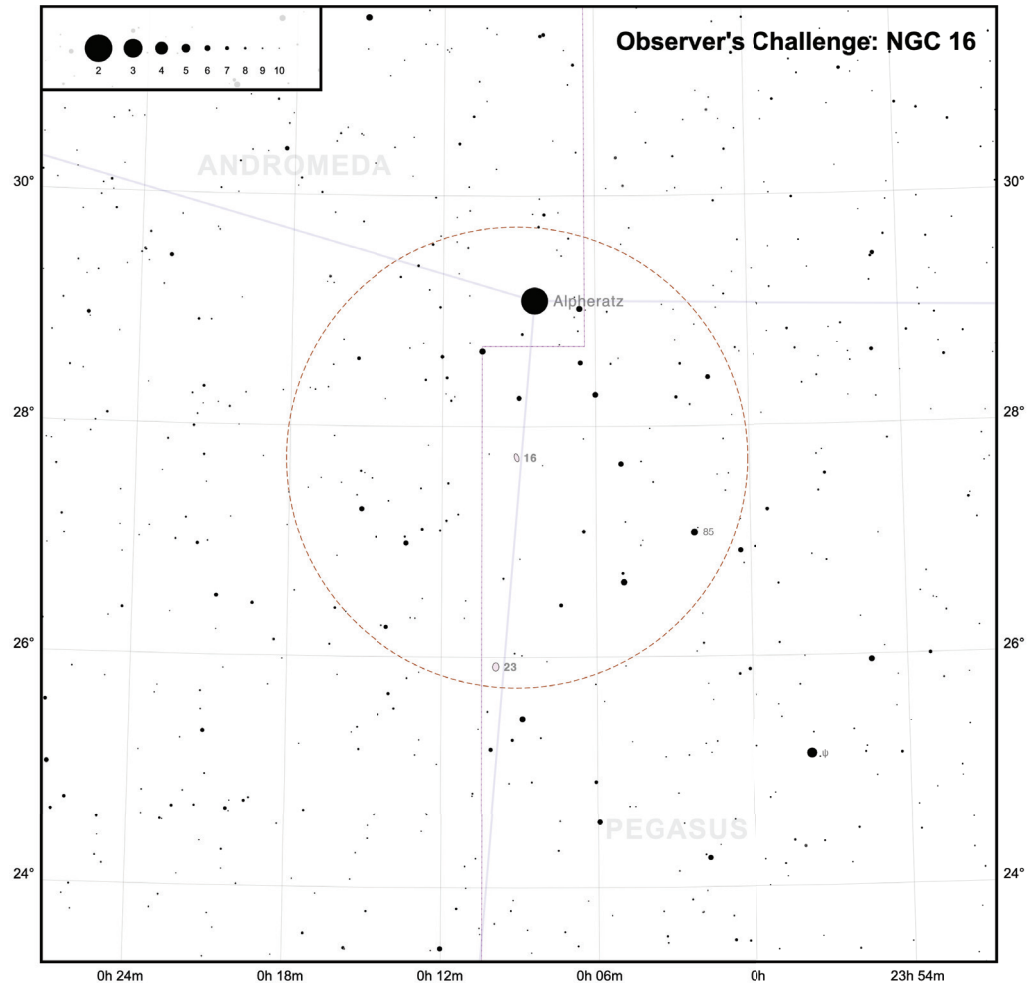
by Glenn Chaple for LVAS  
(Magnitude 12.0, Size 1.8' by 1.0')

Our December Observer's Challenge takes us to the northeast corner of Pegasus and a lenticular galaxy some 123 million light years away (SIMBAD data). Discovered by William Herschel on September 8, 1784, its appearance ("A faint star with small chevelure [hazy luminescence] and 2 burs") led Sir William to enter it into his Catalogue of Nebulae and Clusters of Stars as a Class IV (Planetary Nebulae) object.

With a visual magnitude of 12.0, NGC 16 will challenge medium aperture scopes, especially if observed from an area beset by slight to moderate light pollution. I looked for it with a 10-inch *f*/5 reflecting telescope on an evening when the magnitude limit was around 5. At 140X, I was able to make out little more than a faint star (the galaxy's nucleus). Visual observers in dark-sky locations or working with larger instruments may be able to make out a surrounding oval haze.

The 2000.0 celestial coordinates for NGC 16 are: RA 00h 09m 04.3s, DEC +27° 43' 45", a little over a degree south of the 2nd magnitude star Alpheratz (alpha [α] Andromedae). The accompanying finder chart should enable star-hoppers to find their way from Alpheratz to NGC 16.

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester ([rogerivester@me.com](mailto:rogerivester@me.com)). To find out more about the Observer's Challenge or access past reports, log on to [rogerivester.com/category/observers-challenge-reports-complete](https://rogerivester.com/category/observers-challenge-reports-complete).



Small NGC 16 galaxy is centered, but I wanted to get the general field which is too big for my 32 inch field of view, so I combined 2 sets of images into a mosaic. NGC 16 is in the general center, but on the right side (west) is NGC 1, NGC 2, then moving east NGC 16 and finally just clipped the edge of NGC 22 on the eastern edge.

Taken with my 32 inch telescope in 2 sets, then combined. Mario Motta

# Star Party Update

by Jim Hendrickson

**Saturday, November 20, 2021  
Moonrise on the Seekonk River  
Providence, RI**

For the third time in four years, Skyscrapers, Inc. was invited to participate in the Moonrise on the Seekonk event organized by Blackstone Parks Conservancy and the Narragansett Boat Club at Blackstone Park on the East Side of Providence. The event celebrates the beauty of the Full Moon rising across the Seekonk River, and includes music and food.

Skyscrapers who participated in the event included Francine Jackson with a 4" Celestron refractor, Jim Hendrickson with an 80mm APM refractor, Mark Munkacsy with a home-built 6" Dobsonian, and Michael Corvese with a 90mm Questar Maksutov-Cassegrain telescope. Peter, from Narragansett Boat Club, brought out his giant binoculars as well.

The observing field is a narrow strip of grass between River Drive and the western bank of the Seekonk River just to the north of the Narragansett Boat Club. The area is awash in bright streetlights, but the view overhead and to the east is unobstructed,



making it suitable for viewing of the Moon, planets, and brighter objects..

This year's event was held in November, unlike previous years which were held in July and August. This allowed for an earlier start time, and with the Moon in Taurus, the nearly full Moon rose earlier and notably farther towards the north.

The weather forecast was rather dismal, with near full overcast skies predicted through the evening hours, with only a slight chance of clear conditions right after sunset. Temperatures held steady in the low 40s, with light breezes.

Despite the forecast, the clouds broke early, leaving mainly clear skies, with some clouds towards the east, enough to make for a colorful and dramatic moonrise just after 5:09pm. The Moon created a fiery glow behind the clouds as it rose, but its nearly full orb soon appeared through a break, and remained visible for the duration of the event, with bands of clouds periodically bisecting it.

While the Moon was the main highlight, the sky remained clear enough to view Jupiter and Saturn. Venus set behind the trees too early to view. There was a favorable pass of the International Space Station just before 6pm, but we were so engaged with the group that the time had passed before we realized, and didn't get to point it out. We had also hoped to point out some notable brighter deep-sky objects, such as the Pleiades, but persistent light haze and cloud illuminated by the Moon prevented visibility.

A total of about 70 guests came to see the Moon and planets, many of them being younger kids. All enjoyed the simpler pleasure of watching a full Moon rise, and its reflection in the waves of the Seekonk River, and were wowed by seeing Jupiter and Saturn for the first time. All involved were reminded to keep looking up. The next day in an email, organizer "Rick" Richards noted we were the highlight of the program, and he is looking forward to our returning in 2022.

## November Reports

### Minutes-Skyscrapers Executive Committee Meeting via Zoom

**Thursday November 11, 2021 at 7PM**

Meeting called to order at 7:03PM by President Steve Siok

Present: Steve Siok, Kathy Siok, Steve Hubbard, Sue Hubbard, Linda Bergemann, Francine Jackson, Jim Hendrickson, Bob Janus, Jeff Padell, Ian Dell'Antonio

1. Saturday November 13, 2021 "Observe the Moon" night. Hoping for clear skies at Seagrave. Linda B. will be prepping some videos as a fallback in case of poor weather. Dick Parker's son's Troop is planning on visiting Seagrave for this event.

2. Saturday November 20, 2021- Rain Date for Dick Parker's son's Troop to visit Seagrave.

3. Saturday December 11, 2021- Our Holiday meeting will be at the North

Scituate Community Center. There was conversation about food options as this is usually our Holiday Party. It was decided that we would provide a light buffet with

coffee, water and soda for the reception. Kathy Siok will purchase the food, but will need volunteers to help. Members will be asked to RSVP so that we can get an accurate number for the food purchase. Reception will be at 5:30, talk at 6:30. We must be out of the community center by 8PM.

4. Open Nights at Seagrave

- Saturday December 11-6:30 to 9PM

- Saturday December 18- 6:30 to 9PM

- Steve Siok will work with Bob Horton to get volunteers. The port a john will be extended to be available for the open nights. Bob Janus will check on the rental.

5. RI State Tax Exemption. Kathy Siok applied for a RI State tax exemption and it has been granted. We will receive a letter that can be presented when Skyscraper purchases are made in RI. It is good for 4 years and can be renewed.

6. Trustees Expenses Bob Janus mentioned that there may be some additional expenses for repairs that would exceed the amount budgeted. He was given approval.

7. Linda Bergemann reported that Skyscrapers has been awarded a grant to use the "SLOOH" telescope for purposes of educational and outreach for one year. There is interest in using this to offer workshops in imaging. Jeff Padell explained more about SLOOH and will work with Linda on details.

8. Linda Bergemann was contacted by Ken Cameron's family. They are donating his telescopes ( 5" Dob and a 7"Dob) to Skyscrapers in his memory.

9. Moonrise on the Seekonk will take place on Saturday November 20th. Francine requested an email to ask Skyscraper members to volunteer to help at this event.

10. Francine reported that she has been in contact with Bill Guca's wife to plan a small star party for Bill at their house. She will report further details.

There being no further business, we adjourned at 8:00PM.

Respectfully submitted,  
Sue Hubbard, Secretary



## Cover photo: Venus Daytime Observation by Gregory T. Shanos

Project Begun: Sept 11, 2020 Project Ended: Sept 11, 2020

Seeing Conditions: Clear with a 39% gibbous moon. Good seeing.

Binocular Size: Finderscope 10 x 50

Telescope Type: Meade LX200 GPS Schmidt-Cassegrain Telescope alti-azimuth mounted.

Aperture: 10 inch (250 mm)

Focal Length: 2500mm f/10

Eyepiece Focal Length: 14 mm

Observational Notes, Comments and Impressions:

Venus was the brightest "star" in the eastern sky visible at -4.2 magnitude. Sunrise was at 11h 14m UT (7:14am). Image was taken 11h 15m UT (7:15am) while the sun was rising in broad daylight. Venus was well placed in the sky at 43 degrees above the horizon.

I visually observed Venus through the telescope at 179X. The planet appeared white with a gibbous phase. The sun was

rising and the planet was becoming rather washed out. I quickly imaged the planet with an ultraviolet filter which clearly shows the clouds of Venus. The sulfur dioxide clouds emit light in the ultraviolet portion of the electromagnetic spectrum. The UV filter absorbs ultraviolet therefore the clouds appear dark.

Photographic: Venus in the ultraviolet exhibiting cloud patterns

Observer: Name: Gregory T. Shanos PharmD

Location: Longboat Key (Sarasota), Florida USA 27° 20' 58.57 N latitude 82° 36' 18.76 W elev 5meters

Meade LX200 GPS Schmidt-Cassegrain Telescope 250cm (10 inch) f/10 fl 2500mm Alti-Azimuth Mounted Cameras ZWO ASI290MM (mono) with an ultraviolet filter Firecapture v 2.6.0.8, Autostakkert 3.1.4, Registax 6.1,

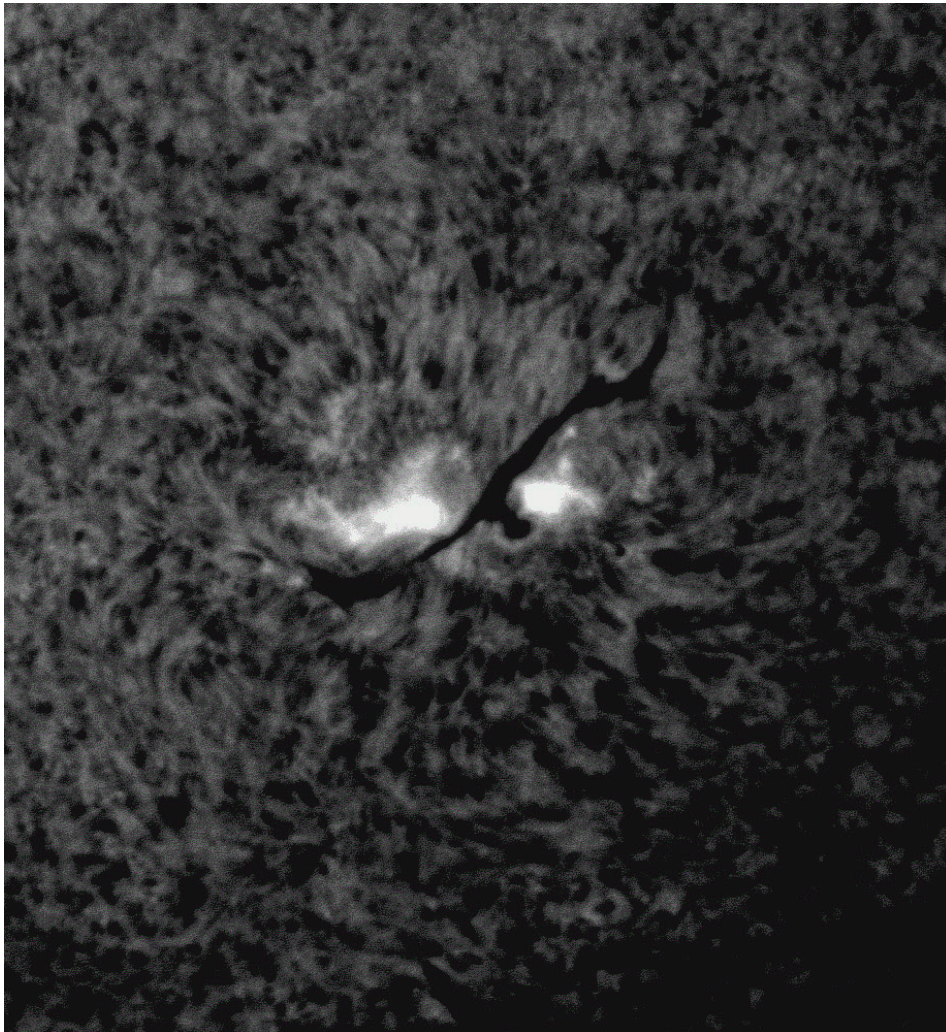
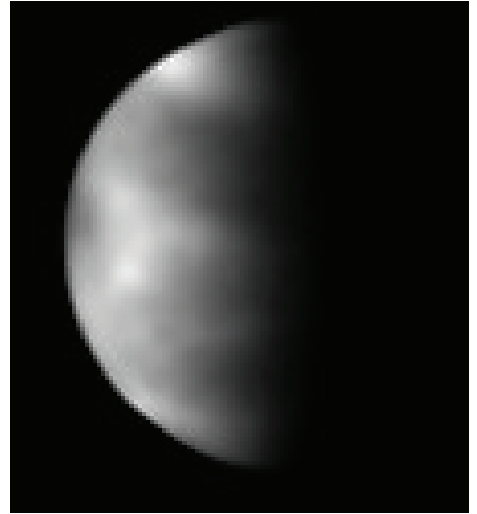
AstraImage 5.5.8.0 WinJupos 11.3.1, Photoshop CS4, The Sky X v10.5

MSI GF65 i7 10gen 6core @ 2.6 GHz,

40GB RAM USB 3.0 laptop computer

Venus in UV mag -4.2 dia 17.9" Phase 64%

CM1 180.2° CMII 53.8°



**Single frame from a video that shows the development of a solar filament over 3 hours by Conrad Cardano.** See full video at <http://www.theskyscrapers.org/solar-activity-november-3-2021>

Date taken: Nov. 3, 2021

Equipment used: Lunt 60mm H-alpha scope on Celestron AVX mount.

ZWO ASI 294mm Camera

Process:

1. a 300 frame, 8 bit video was taken every minute for 3 hours. Each frame was only 1920 x 1200 pixels in size.

2. This produced 137 separate video files. Some were unusable due to clouds.

3. Each file was processed using Autostakkert. Only 50 of the best frames were stacked and sharpened by Autostakkert. This produced 136 separate images.

4. Each image was processed in Astro Art.

a. the image was cropped to concentrate just on the filament.

b. From the first image, a reference point on the filament was determined.

d. For the remaining images, they were shifted accordingly so that the filaments would match.

Finally, all images were strung together into a single video file using RSpec.

# STARRY SCOOP

Editor: Kaitlynn Goulette



## WHAT'S UP

December 4th marks the 25-year anniversary of the launch of the Mars Pathfinder spacecraft. After a 7-month journey to the Red Planet, Pathfinder landed in the Ares Vallis channel. Its rover named Sojourner was the first wheeled vehicle to operate on another planet. While it was originally planned as a 7-day mission, it lasted 83 days studying Mars' atmosphere, geology, and climate.

This month we have the December Solstice occurring on the 21st, which is when the sun reaches its southern most point in the sky. This day has the shortest amount of daylight hours for everyone north of the equator, and marks the start of winter. This apparent motion of the sun, along with the cold winter season, is caused by the tilt of the earth's axis and its revolution around the sun.

December brings us two annual meteor showers. The Geminids run for 10 days and peak on the 13th and 14th. This meteor shower is considered to be one of the best, producing up to 120 meteors an hour. We also have the Ursids Meteor Shower, which run from the 17th to the 25th and peak on December 21st and 22nd. Both are best seen after midnight away from city lights.

Jupiter, Saturn, and Venus are beautifully aligned in the southwestern sky all month following sunset, creating a spectacle that doesn't require any optical equipment to see. These three worlds appear as the brightest star-like objects in this region, and are joined by the crescent moon on the 6th, 7th, and 8th.

After sunset in our eastern sky, Orion can be found rising above the tree line,

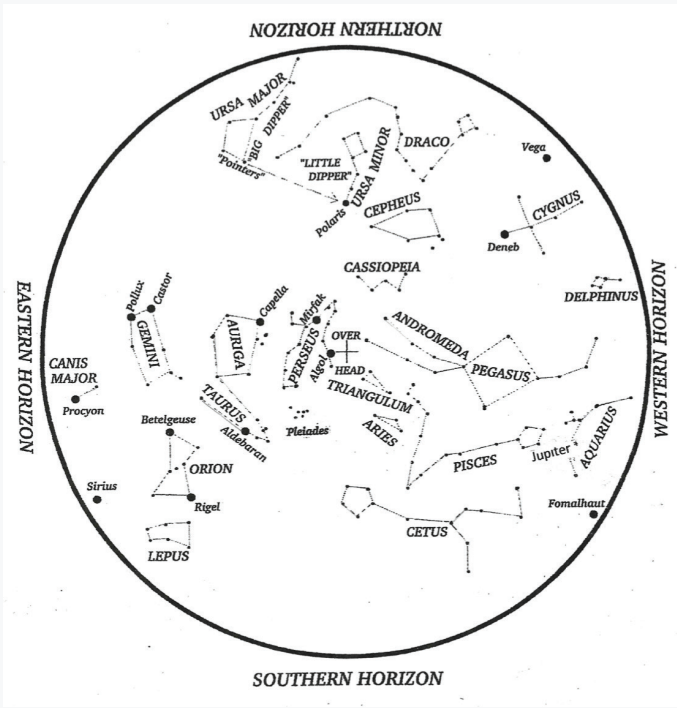
continuing his perpetual hunt of Taurus the Bull across the sky.

As poet Robert Frost puts it, "You know Orion always comes up sideways. "Throwing a leg up over our fence of mountains"

As the evening progresses, other bright winter stars are closely following behind Orion.

## DECEMBER'S SKY

- 4: New Moon**
- 13-14: Geminid Meteor Shower Peak**
- 19: Full Moon**
- 21: December Solstice**
- 21-22: Ursid Meteor Shower Peak**



Credit: Roger B. Culver  
Hold star map above your head and align with compass points.

# OBSERVATIONS

Last month's 99% partial lunar eclipse was the highlight of my recent observations. In the days leading up to it, the forecasts were predicting rain and cloudy weather. But, I lucked out and the sky was clear for the majority of the 3+ hour event.

Lunar eclipses happen when the moon passes through the earth's shadow. The moon's reddish tint during a total or near-total eclipse is caused by sunlight refracted through the earth's atmosphere and reflecting off the moon.

Observing the earth's shadow devour the moon to reach maximum eclipse, and create the reddish, "blood moon," was an incredible experience. It was cloudy during the beginning of the eclipse, but about an hour before maximum, the moon became continually observable. The cold temperatures had me periodically seeking warmth inside my house, but fortunately, with such a long event, I didn't miss much.

Along with viewing the lunar eclipse through my hand-held binoculars, I used my 8-inch Newtonian telescope to capture some photos. I gathered these photos with my Canon DSLR camera at prime focus.

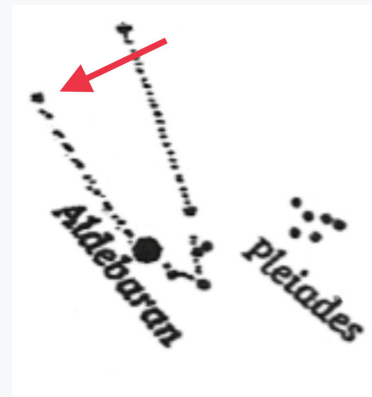
I was very excited to log my fourth lunar eclipse observation, and I'm already looking forward to the next on May 16th, 2022!

The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact [starryscoop@gmail.com](mailto:starryscoop@gmail.com). The Starry Scoop is now on Facebook. Clear skies!

# OBJECT OF THE MONTH

The featured object for the month of December is the supernova remnant M1, commonly known as the Crab Nebula. This nebula's story began in 1054 when Native American and Chinese stargazers recorded it as a "guest star" that was visible even in the daytime sky. We now understand that they were observing an exploding star, or supernova. Today, all that remains is an ever-expanding nebula with a pulsar at its center, rotating 30 times per second.

You can find this nebula just above the southern horn star, Zeta Tauri, in the constellation Taurus the Bull. While it is visible with binoculars under dark skies, a telescope makes the observation easier. Use the map below to help you find it!



Crab Nebula



99% Lunar Eclipse - 11 November 2021  
Photo by Kaitlynn Goulette

# Directions to Seagrave Memorial Observatory

## From the Providence area:

Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

## From Coventry/West Warwick area:

Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

## From Southern Rhode Island:

Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

## From Northern Rhode Island:

Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

## From Connecticut:

- Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.
- or • Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.

## From Massachusetts:

Take Interstate 295 South (off Interstate 95 in Attleboro). Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.



47 Peeptoad Road  
North Scituate, Rhode Island 02857