



# the Skyscraper

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

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### Seagrave Observatory is closed until further notice.

Due to the outbreak of coronavirus, Seagrave Memorial Observatory will remain closed to the public until further notice.

## Phases of the Moon

**Last Quarter Moon**  
January 6 09:37

**New Moon**  
January 13 05:00

**First Quarter Moon**  
January 20 21:02

**Full Wolf Moon**  
January 28 19:16

## A Behind the Scenes Look at Hubble Space Telescope Operations

An Online Presentation by Mike Wenz  
Saturday, January 2, 7:00pm EST via Zoom

Contact Steve Hubbard ([cstahhs@gmail.com](mailto:cstahhs@gmail.com)) for Zoom Meeting link and information.

Many people have seen the wonderful pictures that the Hubble Space Telescope has produced over the 29 years of its operation so far. However, few people have seen what is truly involved in the day to day operation of a telescope that has been called a National Treasure. This talk will take a look behind the scenes and explain how the telescope is operated and what it takes to make the science observations that lead to all of the discoveries Hubble has been involved in. It will show what is involved in keeping the telescope functioning as it continues to age and the hardware and instruments on board gets older and older. If you have ever wondered how Hubble can point at and track objects with milliarcsecond accuracy or what Hubble does during meteor showers or when space "junk" is on a collision course with the telescope then this talk will provide you with those answers. The discoveries that the Hubble Space Telescope has made over the years have revolutionized how we view and understand the universe that we live in. The stories of how those discoveries are made day after day is one few people get to hear.

Mike Wenz is the Lead System Engineer of the Optical Telescope Assembly on the Hubble Space Telescope. He is responsible for the three Fine Guidance Sensor instruments on Hubble which allow the telescope to point and guide with the extreme accuracy that is needed to perform the science observations that the telescope has become famous for. He has worked on the Hubble Space Telescope for 27 years and was involved in all 5 of the Servicing Missions

performed by the Space Shuttle. Mike is intimately involved with the day to day operations of the telescope and is the one responsible to investigate any pointing problems or issues that come up on a daily basis. Mike has used the information provided by the Fine Guidance Sensors to serendipitously discover hundreds of new double stars and was involved in a study using the Fine Guidance Sensors that led to the discovery of the smallest Kuiper Belt object ever seen. Mike has been an amateur astronomer for over 44 years and is currently very involved in doing high resolution solar and lunar imaging (with the occasional planetary imaging session thrown in here and there). Back when he was first getting started in amateur astronomy 44 years ago he would attend some of the Sky Scraper meetings and events.

## Upcoming Presentations

**Saturday, February 6**  
John Briggs: A Walking Tour of Optical History - Artifacts and Anecdotes from the Astronomical Lyceum

**Saturday, March 6**  
Camille M. Carlisle: A Behind the Scenes Look at Sky & Telescope

# President's Message

by Steve Siok

Happy New Year to all! I hope everyone had a merry and healthy Christmas, a jolly Festivus, and got to see the Great Conjunction on the solstice.

With the new year upon us we need to look forward and plan for our renewed future "live" at Seagrave. I want us to have monthly meetings in the meeting hall again, but perhaps with the Zoom component still in place. We have found lots of participation from members of other societies throughout southern New England and I want them to continue to join us. The other thing we need is in person observing, especially for our members who have suffered long from a lack of eyepiece time. The trustees have been very busy repairing the dome and roll-offs so everything is ready to go! At the first in-person meeting Jim Crawford has promised a photographic tour of the grounds and a description of all he and Bob have accomplished.

Our outreach has definitely increased

this year and it is evident from our new members joining us. We have over 130 members at last count. Many are joining because of the Facebook page managed by Jimmy's efforts and the Night Sky Network news and calendar being managed by Linda. Thank you both! We also are getting interest from school kids. Dave Huestis held a session with a boy from Rocky Hill School at Seagrave. He gave him a tour and talked about our history. This student is very interested in the Hubble Space Telescope and will attend our January meeting. In addition Steve Siok is mentoring two high school juniors who are interested in astrophysics and engineering. Both are proud owners of new 8" Dobsonians and we are discussing how they can build Poncet mounts for their scopes as a senior high school project.

Our financial situation is very stable. Because of the pandemic we have been without internet at Seagrave and we did not need the port-a-john this last summer. In

## New Members Welcome to Skyscrapers

JR & Catherine  
Johnson-Roehr

addition Sue Hubbard has renegotiated our insurance. It will reduce that expense significantly. Thank you, Sue.

So for the time being please continue to join us for our Zoom meetings. Steve Hubbard has found great speakers and people are coming out of the woodwork asking if they can give a talk! Please join in. I hope you are not afraid of Zoom. We have had no issues with its use. If you need some help joining a meeting, please contact Kathy or Linda. You do not need to have a Zoom account.

That's all for now and let's all look forward to the coming year. It promises to make up for last year.

Clear skies.



## Monthly Presentation Videos on YouTube

With our monthly meetings going virtual this year, 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/channel/UCEZ5UnO-Sly0DXsSrUAXONg>



*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 **January 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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# Astronomical Highlights for 2021

by Dave Huestis

Happy New Year everyone. I can't believe it is 2021! Happy 50th Anniversary to my fellow 1971 graduates of North Smithfield High School. Perhaps later this year we will be able to celebrate this milestone in our lives. For now, I will focus on some of the astronomical highlights for 2021. We are always at the mercy of the local Southern New England weather, but I hope when the skies are clear you will venture outdoors to experience a few of Mother Nature's beautiful stargazing events.

We are fortunate the sky gods provide us northern hemisphere sky observers with a decent meteor shower to begin the new year. On the night of January 2-3, the peak of the Quadrantid meteor shower occurs. These fast-moving shooting stars blaze across the sky at 25.5 miles per second. Usually blue in color, the Quadrantids can appear anywhere in the sky, but their radiant point (the area of sky from where the meteors appear to originate) is not far from the end star, Alkaid, of the Big Dipper's handle. From midnight till dawn, this area of sky will rise higher and higher above the northeast horizon. By 4:00 a.m. the radiant will be almost at zenith (directly overhead). You'll know you've spotted a Quadrantid meteor if its dust train through the sky points back to the radiant point.

While the Quadrantid meteor shower can produce up to 100 meteors per hour during peak, a more modest 60 meteors per hour is likely under a moon-less sky. Unfortunately, a bright waning gibbous Moon (which was Full on December 30) will rise around 8:30 p.m. on the 2nd and will be in the sky almost all night. This circumstance will certainly reduce your meteor count. Keep in mind that this meteor display also sports a very narrow peak of activity, only several hours in duration, that can easily be missed.

Also, on the 2nd of January, the Earth is at perihelion — closest to the Sun for the year. Why then is this time of the year usually so cold for us in New England? The northern hemisphere where we are located is tilted away from the Sun as the Earth's axis of rotation remains fixed in space in its solar orbit. Here's a brief video refresher on this topic: <https://youtu.be/NweLxtmnzv4>. Head to the southern hemisphere if you wish to bask in the more direct rays of sunshine.

For you early risers during the first week of January you can still spot brilliant Venus low in the southeast sky before sunrise. Venus will soon be unobservable as it moves closer to the Sun from our vantage point in space. Venus will return to the evening sky very low after sunset in the west-northwest during early June.

The solar system's innermost planet, Mercury, can be seen only when it moves away from the Sun as seen from the Earth. We can observe Mercury in the eastern sky before sunrise, or in the western sky after sunset. These events are called elongations. Some elongations are better than others.

On January 24 Mercury will appear low in the southwest sky within 10 degrees of the horizon during late twilight. Another evening elongation occurs on the night of May 17 about 12 degrees above the north-northwest horizon during late twilight as well. For early risers there is a morning elongation on October 25 when Mercury will appear about 10 degrees above the east-southeast horizon. These dates will provide you the best opportunity to get a glimpse of this hellish world (unless you were fortunate to view its transit across the face of the Sun last November 11).

Do you remember where you stored your solar eclipse glasses after the August 21, 2017 eclipse? Well, I'm providing an advance notice for you to find them in preparation for the **June 10 partial solar eclipse**. This event will be somewhat unique in that the eclipse will already be in progress as the Sun rises that morning. You are going to



A partial solar eclipse occurs on the morning of June 10, when the Sun will be 72% obscured by the Moon at 5:32am.

need an unobstructed view of the northeast horizon to witness the onset of this event. The Sun will become visible peeking above the horizon around 5:15 a.m. When the Sun completely clears the horizon two minutes later 53% of the solar surface will already be covered by the Moon. Mid or maximum eclipse occurs at 5:32 a.m. when 72% of the solar surface will be obscured. After that time the Moon will move away from the Sun and the eclipse will end at 6:31a.m. From start to finish for us in Rhode Island the duration of this eclipse will be approximately one hour and 17 minutes. I will provide a more extensive article about the details, including cautions on how to observe it safely, in my June column.

In addition, there is another eclipse

## Meteor Shower Prospects for 2021

| Month    | Shower         | Date  | Moon Phase                        |
|----------|----------------|-------|-----------------------------------|
| January  | Quadrantids    | 2-3   | Waning Gibbous                    |
| April    | Lyrids         | 21-22 | Waxing Gibbous                    |
| May      | Eta Aquarids   | 4-5   | Waning Crescent                   |
| July     | Delta Aquarids | 28-29 | Waning Gibbous                    |
| July     | Capricornids   | 28-29 | Waning Gibbous                    |
| August   | Perseids       | 11-12 | Waxing Crescent                   |
| October  | Orionids       | 20-21 | Full Moon                         |
| November | Leonids        | 16-18 | Waxing Gibbous (Full on the 18th) |
| December | Geminids       | 13-14 | Waxing Gibbous                    |

visible locally in 2021, but this time it is a partial lunar eclipse. Soon after midnight on the morning of November 19, the Full Beaver Moon will glide through the Earth's dark umbral shadow. The eclipse will begin at 1:20 a.m. EST with the Moon high in the sky, 64 degrees above the southern horizon. Mid eclipse, or when the greatest amount of the lunar surface is immersed in the umbral shadow, occurs at 4:20 a.m. 97% of the lunar disk will be eclipsed. After that moment the Moon will begin to slide out of the Earth's shadow. For us here, the Moon will set below the west-northwest horizon at 6:50 a.m. before the end of the eclipse. This eclipse will take place with the Moon within the constellation Taurus. Before the eclipse begins you may notice the Hyades and Pleiades star clusters above and to the left of the Moon. As the Full Moon's brightness diminishes as it enters the Earth's shadow, watch these star clusters emerge as if someone were varying a dimmer switch. I'll provide more details in my November column.

I am slightly optimistic that later this year the local observatories will be able to resume public observing sessions. Frosty Drew has remained open under strict Covid-19 mitigation protocols. See their

website for details. Regardless, while the other observatories remain closed, do visit their respective websites for a wealth of astronomical information.

- **Seagrave Memorial Observatory** ([www.theskyscrapers.org](http://www.theskyscrapers.org))
- **Ladd Observatory** ([brown.edu/Ladd](http://brown.edu/Ladd))
- **Margaret M. Jacoby Observatory** ([www.ccri.edu/physics/observatory.htm](http://www.ccri.edu/physics/observatory.htm))
- **Frosty Drew Observatory** ([www.frostydrew.org/](http://www.frostydrew.org/))

Some of the topics highlighted in this column may be covered in depth as an event date approaches.

Please clip and save the chart showing

the observing prospects for the 2021 meteor showers. These displays of shooting stars only require your eyes, dark skies, and patience to enjoy.

Keep your eyes to the skies for 2021 and always.

Before you know it, I will be writing my highlights column for 2022!!

Be safe and remain healthy.



*Dave Huestis is Skyscrapers Historian and has been contributing monthly columns to local newspapers for nearly 40 years. See more at <http://theskyscrapers.org/dave-huestis>*

## Geminids report for 12/13/2020

by Dave Huestis

Not sure how many members venture out to watch "burning rocks" fall from the sky these days.

I never tire of observing shooting stars, as long as the activity keeps up so I don't fall asleep. Here's my report:

At 10pm it was exceptionally clear.

Was about 42 degrees when I started. Not bad for the Geminids. Got colder as the

night progressed.

A slight breeze came up. Some high thin clouds were beginning to encroach the sky, so I called it quits a little early at 11:30pm.

Saw 20 Geminids. Nothing spectacular. Only a couple of fairly bright ones.

Looked out at 4:30am and it was totally overcast.

Be well.

**For sale** is a wonderful vintage Vixen 80mm "planet killer" long focus refractor in excellent condition with A+ optics. A "rare" long-focus refractor made in Japan by Vixen. It has a focal length of 1200mm and a focal ratio of F/15. The identifying vixen logo is under the original focuser which is included.

The mounting rings and dovetail bar are included. Condition is used but in A+ condition with pristine optics. Has been well cared for. This telescope was originally sold by RVR optical of Rochester, NY.

Optics are virtually perfect, and have a clean clarity rating of 98%. There is no degradation on the coating. These Japanese telescopes have the highest Strehl ratio and are regularly considered to be apochromatic.

The telescope comes with a Kylebooker rifle case to hold and carry the scope. This scope has been upgraded on the back end and a new finderscope. A brand new GSO Right-Angle correct image 8X50 finderscope with telescope mount has been added. A brand new GSO 2-speed 2-inch with 1.25" adapter focuser has replaced the original single speed focuser. Original focuser is included. The GSO is very smooth. The Vixen has the white "classic" with black trim colors. Also comes with original R.V.R. Optical manual. I can send you additional photos upon your request. This package also includes a Bresser EXOS2 mount and field tripod in excellent condition. It is white and has reflective tape on the tripod legs and the counterweight shaft to help see in the dark.

Paypal or Cash only! \$1400 LOCAL PICKUP ONLY! I live in Rhode Island and can meet you at a half way destination for transaction.

Thanks for looking and clear skies! Ronald Zincon [ronald@ronaldzincconephotography.com](mailto:ronald@ronaldzincconephotography.com)



All dates/times Eastern

Asteroids brighter than 9.0 at opposition are listed

For conjunctions, if both objects rise before midnight, the conjunction is listed for the evening closest to the conjunction, even if they are closest in the morning sky on the following day.

## January

- 1 Moon & M44 (2.1°)
- 2 Earth at Perihelion
- 6 Last Quarter Moon
- 8 Moon & Zubenelgenubi (1.8°)
- 10 Mercury, Jupiter & Saturn (2.3°)
- 11 Moon & Venus (4.3°)
- 13 New Moon
- 14 Moon, Mercury, Jupiter & Saturn
- 15 Venus & M22 (0.7°)
- 20 First Quarter Moon
- 20 Mars & Uranus (1.5°)
- 20 Moon & Mars (5.6°)
- 21 15 Eunomia Opposition (mag. 8.4)
- 23 Mercury Greatest Elongation (E 19°)
- 23 Saturn Conjunction
- 28 Full Wolf Moon

## February

- 4 Last Quarter Moon
- 6 Venus & Saturn (0.4°)
- 11 New Moon
- 11 Venus & Jupiter (0.4°)
- 13 Moon & Neptune (4.1°)
- 15 Mercury & Jupiter (3.8°)
- 17 Moon & Uranus (3.6°)
- 18 Moon & Mars (3.6°)
- 19 First Quarter Moon
- 24 Moon & M44 (1.5°)
- 27 Full Snow Moon

## March

- 4 4 Vesta Opposition (mag. 5.9)
- 5 Last Quarter Moon
- 5 Mercury & Jupiter (0.4°)
- 10 Moon & Jupiter (5.5°)
- 10 Neptune Conjunction
- 13 New Moon
- 16 Moon & Uranus (3.6°)
- 19 Moon & Mars (2.5°)
- 20 Equinox (04:37)
- 28 Full Worm Moon
- 21 First Quarter Moon
- 30 Moon & Zubenelgenubi (1.0°)

## April

- 4 Last Quarter Moon
- 6 Moon & Saturn (4.3°)
- 7 Moon & Jupiter (4.8°)
- 11 New Moon
- 12 Moon & Venus (4.7°)
- 17 Moon & M35 (0.2°)
- 17 Moon & Mars (5.0°)
- 20 First Quarter Moon
- 22 Venus & Uranus (0.2°)
- 25 Mercury & Venus (1.2°)
- 26 Full Pink Moon
- 26 Mars & M35 (0.4°)
- 30 Uranus Conjunction

## May

- 3 Last Quarter Moon
- 3 Mercury & M45 (2.2°)
- 6 Mercury Greatest Elongation (W 27°)
- 11 New Moon
- 11 Venus & M45 (5.1°)
- 12 Moon & Venus (0.8°)
- 13 Moon & Mercury (2.7°)
- 15 Moon & Mars (2.4°)

- 17 Mercury Greatest Elongation (E 22°)
- 17 Moon & M44 (1.9°)
- 19 First Quarter Moon
- 24 Moon & Zubenelgenubi (0.9°)
- 26 Full Flower Moon (Eclipse, Penumbral @ Moonset)
- 28 Mercury & Venus (0.4°)
- 31 Moon & Saturn (4.6°)

## June

- 1 Moon & Jupiter (5.4°)
- 2 Last Quarter Moon
- 3 Moon & Neptune (4.9°)
- 3 Venus & M35 (0.5°)
- 7 Moon & Uranus (2.6°)
- 10 Annular Eclipse (Partial Sunrise)
- 11 Moon & Venus (3.2°)
- 13 Moon & Mars (2.3°)
- 17 First Quarter Moon
- 20 Sostice (23:32)
- 23 Mars & M44 (0.0°)
- 24 Full Strawberry Moon
- 26 Moon & Saturn (5.0°)
- 30 Moon & Neptune (5.0°)

## July

- 1 Last Quarter Moon
- 2 Venus & M44 (0.2°)
- 4 Mercury Greatest Elongation (W 22°)
- 4 Moon & Uranus (4.5°)
- 5 Earth at Aphelion
- 8 Moon & Mercury (4.0°)
- 9 New Moon
- 11 Moon & Venus (5.6°)
- 12 Venus & Mars (0.5°)
- 17 First Quarter Moon
- 17 Pluto Opposition (mag. 14.9)
- 17 6 Hebe Opposition (mag. 8.4)
- 21 Venus & Regulus (1.1°)
- 23 Full Buck Moon
- 25 Moon & Jupiter (5.0°)
- 29 Mars & Regulus (0.6°)
- 31 Last Quarter Moon

## August

- 1 Moon & Uranus (2.9°)
- 2 Saturn Opposition
- 8 New Moon
- 8 Moon & Mercury (3.6°)
- 9 Moon & Mars (4.0°)
- 10 Moon & Venus (5.9°)
- 11 Mercury & Regulus (1.1°)
- 14 Moon & Zubenelgenubi (0.4°)
- 15 First Quarter Moon
- 18 Mercury & Mars (0.2°)
- 18 Moon & Nunki (0.0°)
- 19 Jupiter Opposition
- 20 Moon & Saturn (4.7°)
- 21 Moon & Jupiter (4.2°)
- 22 Full Sturgeon Moon
- 23 Moon & Neptune (4.0°)
- 27 Moon & Uranus (1.6°)
- 30 Last Quarter Moon

## September

- 1 Moon & M35 (0.5°)
- 4 Moon & M44 (2.7°)
- 5 Venus & Spica (1.6°)
- 6 New Moon
- 7 Moon & Mars (3.2°)

- 9 Moon & Venus (4.1°)
- 11 2 Pallas Opposition (mag. 8.5)
- 13 First Quarter Moon
- 13 Mercury Greatest Elongation (E 27°)
- 13 1 Ceres & Aldebaran (0.9°)
- 14 Neptune Opposition (mag. 7.9)
- 16 Moon & Saturn (4.3°)
- 17 Moon & Jupiter (5.3°)
- 20 Full Harvest Moon
- 21 Mercury & Spica (1.5°)
- 22 Equinox (14:21)
- 23 Venus & Zubenelgenubi (2.1°)
- 24 Moon & Uranus (4.5°)
- 28 Last Quarter Moon

## October

- 6 New Moon
- 7 Mars Conjunction
- 9 Moon & Venus (2.0°)
- 12 First Quarter Moon
- 13 Venus & M80 (1.4°)
- 13 Moon & Saturn (5.9°)
- 16 Venus & Antares (1.4°)
- 17 Moon & Neptune (5.3°)
- 20 Full Hunter's Moon
- 21 Moon & Uranus (1.8°)
- 23 Venus & M19 (0.1°)
- 25 Mercury Greatest Elongation (W 18°)
- 27 Venus Greatest Elongation (E 47°)
- 28 Last Quarter Moon

## November

- 2 Mercury & Spica (4.1°)
- 3 Moon & Mercury (3.6°)
- 4 New Moon
- 4 Moon & Mars (4.0°)
- 4 Uranus Opposition
- 7 Moon & Venus (4.1°)
- 10 Mercury & Mars (1.0°)
- 10 Moon & Saturn (5.7°)
- 11 First Quarter Moon
- 11 Moon & Jupiter (4.9°)
- 13 Moon & Neptune (4.3°)
- 16 Venus & Antares (1.4°)
- 17 Moon & Uranus (1.5°)
- 19 Venus & Nunki (0.2°)
- 19 Full Beaver Moon (Partial Eclipse)
- 22 Mars & Zubenelgenubi (0.1°)
- 24 Moon & M44 (2.7°)
- 26 1 Ceres Opposition (mag. 7.0)
- 27 Last Quarter Moon

## 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°)

# Clock Face Curiosity: The Numeral IIII

by Francine Jackson

Have you noticed there's always things around you that you "see" but you might not see? One of these was recently sent to me, a question on why some old-time clocks sometimes have four listed as "IV," while others are inscribed as "IIII." It may not be the most burning question with respect to timekeeping, but, in a room where especially a grandfather clock might reside, it might have you looking twice to observe.

Apparently, in earlier times, the IV actually was another way to spell the Roman god Jupiter – IVP-PITER, and, let's face it, who would want to demean the king of the gods with a part of his name on a clock? Hence, the IIII designation.

However, in later times, another possibility was born: the IV for some early peoples might have become a problem for them in determining the subtractive property of a one from a five; also, it's possible many might have often confused the IV (4) with VI (6), even though they are situated at differing positions on a clock face. Add to that, the possibility that rulers such as Louis XIV was very comfortable with himself, and believed he was more worthy of the IV. He couldn't imagine himself as XIII, so having his numeral was too formal for a clock.

Surprisingly, the clockmakers also determined that the four Is gave a nice form of symmetry to a face; by putting them, the clock now began with I, II, III, and IIII. Next were four numbers containing "V": V, VI, VII, and VIII. Finally, the last four would then contain "X": IX, X, XI, and XII.

Of course, the form of Roman Numerals on a clock doesn't carry the importance today, as much of our timepieces are digital; still, when you do find yourself staring at an old clock, check out the numbers, and be thankful we don't have to worry about IVPPIITER bothering us anymore.



*Francine Jackson is a NASA Solar System Ambassador, writes the weekly newsletter for Ladd Observatory See more at <http://theskyscrapers.org/francine-jackson>*



The Walter Folger Astronomical Clock (1790) in Nantucket. The clock face is typical of those that use Roman numerals in that the "4" is depicted as "IIII" rather than "IV".

## Seasons Greetings from Helga Dyck

I wanted to tell you that I appreciate being in the loop of Skyscrapers. These are strange times for sure. I look outside at the observatories and miss Gerry even more. I really enjoyed the last meeting my son and I attended. Looking forward to better times and meeting old friends.

Happy Christmas and a Healthy New Year.

Please pass my greetings on.

Helga

# Check Your Sky's Quality with Orion!

By David Prosper

Have you ever wondered how many stars you can see at night? From a perfect dark sky location, free from any light pollution, a person with excellent vision may observe a few thousand stars in the sky at one time! Sadly, most people don't enjoy pristine dark skies – and knowing your sky's brightness will help you navigate the night sky.

The brightness of planets and stars is measured in terms of **apparent magnitude**, or how bright they appear from Earth. Most visible stars range in brightness from 1st to 6th magnitude, with the lower number being brighter. A star at magnitude 1 appears 100 times brighter than a star at magnitude 6. A few stars and planets shine even brighter than first magnitude, like brilliant Sirius at -1.46 magnitude, or Venus, which can shine brighter than -4 magnitude! Very bright planets and stars can still be seen from bright cities with lots of light pollution. Given perfect skies, an observer may be able to see stars as dim as 6.5 magnitude, but such fantastic conditions are very rare; in much of the world, human-made light pollution drastically limits what people can see at night.

Your sky's **limiting magnitude** is, sim-

ply enough, the measure of the dimmest stars you can see when looking straight up. So, if the dimmest star you can see from your backyard is magnitude 5, then your limiting magnitude is 5. Easy, right? But why would you want to know your limiting magnitude? It can help you plan your observing! For example, if you have a bright sky and your limiting magnitude is at 3, watching a meteor shower or looking for dimmer stars and objects may be a wasted effort. But if your sky is dark and the limit is 5, you should be able to see meteors and the Milky Way. Knowing this figure can help you measure light pollution in your area and determine if it's getting better or worse over time. And regardless of location, be it backyard, balcony, or dark sky park, light pollution is a concern to all stargazers!

How do you figure out the limiting magnitude in your area? While you can use smartphone apps or dedicated devices like a Sky Quality Meter, you can also use your own eyes and charts of bright constellations! The Night Sky Network offers a free printable Dark Sky Wheel, featuring the stars of Orion on one side and Scorpius on the other, here: [bit.ly/darkskywheel](http://bit.ly/darkskywheel). Each

wheel contains six “wedges” showing the stars of the constellation, limited from 1-6 magnitude. Find the wedge containing the faintest stars you can see from your area; you now know your limiting magnitude! For maximum accuracy, use the wheel when the constellation is high in the sky well after sunset. Compare the difference when the Moon is at full phase, versus new. Before you start, let your eyes adjust for twenty minutes to ensure your night vision is at its best. A red light can help preserve your night vision while comparing stars in the printout.

Did you have fun? Contribute to science with monthly observing programs from Globe at Night's website ([globeatnight.org](http://globeatnight.org)), and check out the latest NASA's science on the stars you can - and can't - see, at [nasa.gov](http://nasa.gov).



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](http://nightsky.jpl.nasa.gov) to find local clubs, events, and more!



The Dark Sky Wheel, showing the constellation Orion at six different limiting magnitudes (right), and a photo of Orion (left). What is the limiting magnitude of the photo? For most observing locations, the Orion side works best on evenings from January-March, and the Scorpius side from June-August.

# Cluster and Reflection Nebula in Perseus: IC 348

by Glenn Chaple for LVAS

Mag: 10.1, Size: 2.7' X 1.8'

IC 348 is a star-forming region in Perseus, located just 7 arc-minutes south and slightly east of the magnitude 3.8 star omicron (o) Persei. It contains several hundred stars, most of which are too faint to be seen with typical backyard scopes. The cluster illuminates the surrounding reflection nebula VdB 19. Visually, a small-aperture scope will capture a dozen or so of the brighter cluster members, while the nebulosity mandates medium to large apertures and a dark-sky location.

In her book *Deep-Sky Wonders*, Sue French mentions a triple star,  $\Sigma 439$ , and a double star,  $\Sigma 437$ , that are associated with IC 348. In most scopes,  $\Sigma 439$  appears as a magnitude 8.8 and 10.3 double separated by  $23.4''$ . The brighter star is actually a tight binary system (BD+31°643) whose magnitude 9.3 and 9.5 components, both hot B5-type main sequence stars, are just  $0.6''$  apart.  $\Sigma 437$  is a near twin system comprised of magnitude 9.8 and 10.0 stars separated by  $11.4''$ .

IC 348 is a young open cluster, perhaps no more than 2 million years old. Cluster and nebula are 900 to 1000 light years away.

*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](http://rogerivester.com/category/observers-challenge-reports-complete).*



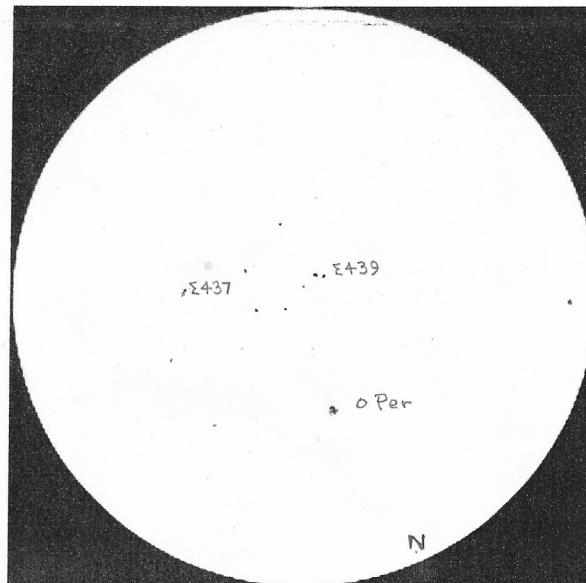
Taken with 32-inch scope using asi6200 camera. About 90 minutes total imaging, 30 minutes each red/green/blue. North is up. Image by Mario Motta (ATMoB)



## OBSERVING LOG

NAME: Glenn Chaple  
 DATE (M/D/Y) 12 / 08 / 2020 TIME: 8 : 15  
 OBSERVING SITE: 82 S. Harbor Rd. Townsend MA  
 SKY CONDITIONS: Seeing (Antoniadi Scale) IV Poor Limiting Magnitude 5  
 OBJECT: IC 348 TYPE: OC CONSTELLATION: Per

SKETCH (note direction of west)



NOTES:

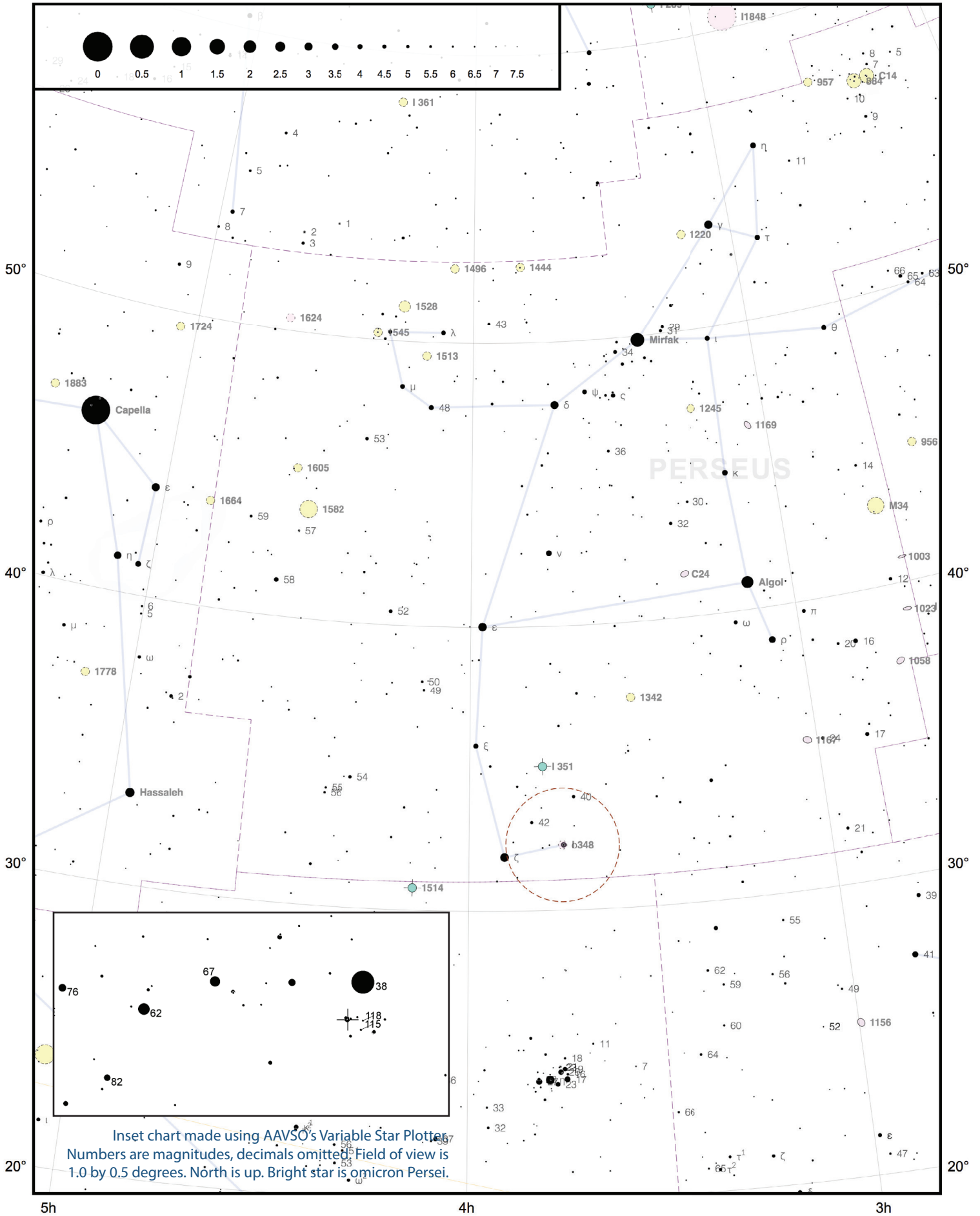
Rather sparse cluster. Only a handful brighter than 11th magnitude. Cluster dominated by the wide double  $\Sigma 439$ . No sign of nebulosity, even with narrowband filter

OBSERVING EQUIPMENT

Binoculars X  
 Telescope: 10" f/5 reflector Eyepiece: 9mm Nagler  
 Mag: 141 X Field Diam: 0.6 ° Filter (if any): \_\_\_\_\_

IC 348, as seen with 10-inch f/5 reflector at 141X. Field is 0.6 degrees across. Sketch by Glenn Chaple (ATMoB)





Inset chart made using AAVSO's Variable Star Plotter. Numbers are magnitudes, decimals omitted. Field of view is 1.0 by 0.5 degrees. North is up. Bright star is omicron Persei.

# Star Party Update

## Great Conjunction at Norman Bird Sanctuary

Monday, 12/21/2020 by Jim Hendrickson

After checking several forecasts almost hourly through the weekend and into Monday morning, we had convinced Sara that Tuesday would be the better night, as it looked like Monday was over 80% cloud cover between 1600-1700, when viewing was to begin at Norman Bird Sanctuary in Middletown. I think she was convinced as well, until she contacted NBS only to learn that the star party was part of another program that couldn't be moved to Tuesday. This, coupled with what looked like an overly optimistic sliver of clear-ish sky only shown in the Chart Sky Chart forecast had us packing up and heading to Middletown just after 15:00.

Leaving North Providence and Lincoln, a large clearing occurred over the east, then south, but further south looked clouded out. Going over the Iway bridge everything to the south looked to be covered by thick fog, but by the time we got to Aquidneck Island, the sky to the west started to open again, giving view to a bright, golden sunset just as we arrived after 16:00.

Just before arriving we saw about 400 Canada geese flying overhead. The parking lot, still covered with snow, slush, and mud from last week's storm, was already full, and we were directed to the second driveway near the farmhouse to set up in the field just to the south.

Sara had an 8" Dobsonian, and we met Jon who had a C8 set up. As twilight settled in we began to set up our scopes. Francine's telescope mount is out of commission as I need to get some replacement hardware for it, so I brought the ES Twilight altaz mount I won at AstroAssembly two years

ago to mount her 102mm refractor. I also brought my 80mm refractor, but as it happened I left part of my equatorial mount in my car, so we were down to one scope. I had already carried the altaz mount and my 80mm scope out into the field already so we set up that one. I could have swapped in the C90 but I didn't bring the visual back and accessories for it, as I had pre-configured it for my camera. It worked out that this setup was ideal, as Francine could operate the refractor and I could use the camera screen to show live view as well as photos.

Sky conditions continued to improve as it got darker, and the first quarter Moon began to show through breaks in the clouds, and another large flock of geese flew towards the southeast, right in front of the Moon, just after another, smaller flock passed below Jupiter. I usually have difficulty finding planets through bright twilight but lucked out when I pointed the scope at a point in the sky and picked up Jupiter and Saturn right away. With a 25mm eyepiece, the view of the tiny planets immediately reminded me of looking at Mizar and Alcor through a low power, even though the planets were only about half the separation of the Mizar/Alcor pair.

Francine took over operation of the refractor and as it got darker I was able to begin getting photos of the pair when the first group of observers arrived. They had separated the visitors into two groups, one observed while the other went on a nature hike around the preserve. The observers wore masks and simple goggles to keep from contacting the eyepieces of the scopes. This was a plus in using the camera as there

is no contact to view the images.

I used the same tripod and swivel mount that I took out to the eclipse, but as this was meant to carry a 400-600mm lens, operating the 1300mm C90 on it was a bit sensitive to vibration, and the azimuth axis can't be locked. Without the 8x40mm finder on the C90 and a cable release on the camera capturing the planets would have been dif-



icult to impossible.

As the sky darkened, the planets began to sparkle. I've seen conjunctions of Moon & Venus, Moon & Mars, Moon & Jupiter, Venus & Jupiter, and even the rare Uranus & Neptune, but this is the first time I've seen Jupiter & Saturn in the same telescopic view.

The temperature was around freezing and the air felt quite damp. About an hour into the session, some banks of haze began to temporarily obscure the sky to the west, but Jupiter and Saturn remained visible long enough for the second group of observers to see them, though they had grown considerably dimmer and yellow-tinted. When Jupiter and Saturn became too dim to im-



age, I moved to the Moon. Haze and fog soon covered the Moon, softening its glow over the field. It is a bit of an unusual view to see the clouds illuminated from above, rather than below, as there isn't much light pollution near the NBS.

By about 18:15 the planets were no longer visible and we were packing it up, considering ourselves fortunate to have seen an event I'm sure we'll be talking about for years to come.

Many astronomical events that get a lot of press are often not really spectacular (Super Moons, meteor showers, closest planetary opposition in generations, etc), but the spectacle of this great conjunction was immediately obvious to all who experienced it. Everyone in attendance was thrilled to have been a part of it, and we were very for-

fortunate to have had an inaccurate weather forecast work in our favor.

Sara expressed an interest in participating in future events with Skyscrapers and may even become a member. Thanks go out to Sara for organizing this event with the Norman Bird Sanctuary.

## Observing the Conjunction

by Dave & Tina Huestis

Did not see it last night (December 21) due to clouds up here in Pascoag.

Did see it tonight with naked-eye, binoculars and my RV-6. Really looked cool through my RV-6 using a 24mm eyepiece. Fit both in field of view with room to spare.

It was just like old times. Had to posi-

tion my scope at the end of my driveway, then look between my neighbors barn and house, and navigate various tree limbs. Fortunately had an unobstructed view for a decent amount of time.

<https://flic.kr/s/aHsmT3uYtl>

Dave & Tina Huestis

## From the Archives

by Dave Huestis

With the Covid-19 pandemic curtailing practically all of my activities, I decided it was finally time to inventory and catalog the historical archives of Skyscrapers, Inc.

We're talking about thousands of pieces of paper, including meeting minutes, secretary and treasurer reports, trustee reports, old membership lists, correspondence, and extensive solar eclipse expedition reports of joint Charles Smiley (Brown University) and Skyscrapers excursions.

This material covers the entire history of Skyscrapers, from its founding on May 5, 1932 to present.

I've been wanting to tackle this project for many years, but when I began teaching two astronomy labs per semester at Bryant I did not have the luxury of "free time."

Since Bryant was insisting on in-person teaching for the fall 2020 semester, I reluctantly decided to retire.

That decision provided me with the time to finally undertake the project to preserve and protect Skyscrapers rich history.

From time to time I plan on sharing some of that history with you in The Skyscraper.

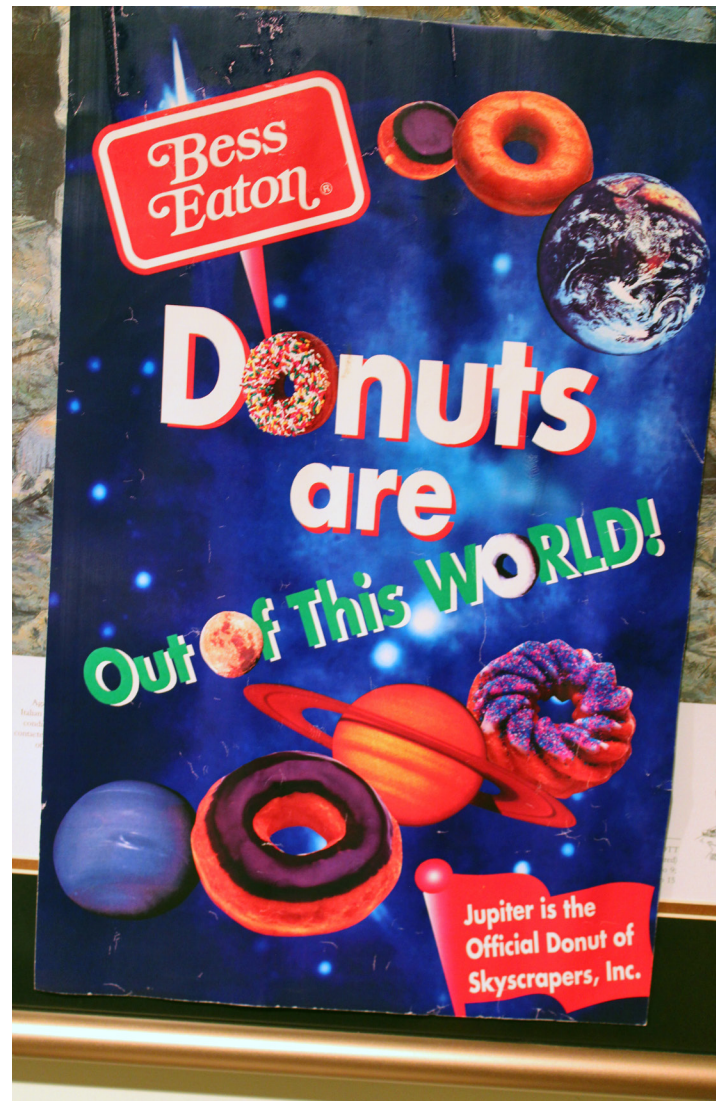
I trust you will find it enlightening.

My first submission for your perusal is an interesting one. I do not remember how it all came about, but I do recall we had some fun with it.

See the image of a poster a once local donut chain Bess Eaton (56 shops) created to promote their "Out of this World" donuts. I do not remember the year, nor have I been able to locate any information about it from our records or elsewhere. Note the Jupiter donut. Bess Eaton provided a few dozen for one of our monthly meetings.

I have a sweet tooth (actually, all 32 of them were once so designated), but these donuts were the sweetest pastry I had ever eaten. Consuming one would send even a normal person's blood sugar into diabetic shock!

I look forward to sharing other Skyscrapers historical tidbits with you in future newsletters.



# The Sun, Moon & Planets in January

This table contains the ephemeris of the objects in the Solar System for each Saturday night in January 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>     | 2    | 18 51.3 | -22 54.9 | Sgr   | -26.8 | 1951.9 | -      | -        | -       | 0.98    | 07:13 | 11:50   | 16:27 |
|                | 9    | 19 22.0 | -22 06.1 | Sgr   | -26.8 | 1951.7 | -      | -        | -       | 0.98    | 07:13 | 11:53   | 16:34 |
|                | 16   | 19 52.3 | -20 56.1 | Sgr   | -26.8 | 1951   | -      | -        | -       | 0.98    | 07:10 | 11:56   | 16:42 |
|                | 23   | 20 22.0 | -19 26.6 | Cap   | -26.8 | 1950   | -      | -        | -       | 0.98    | 07:06 | 11:58   | 16:50 |
|                | 30   | 20 51.0 | -17 39.5 | Cap   | -26.8 | 1948.4 | -      | -        | -       | 0.99    | 07:00 | 11:59   | 16:59 |
| <b>Moon</b>    | 2    | 9 21.9  | 19 32.3  | Cnc   | -12.6 | 1872.6 | 146° W | 91       | -       | -       | 19:01 | 02:33   | 09:56 |
|                | 9    | 15 25.2 | -16 45.2 | Lib   | -11.1 | 1923.3 | 56° W  | 22       | -       | -       | 03:23 | 08:27   | 13:23 |
|                | 16   | 22 16.4 | -16 24.0 | Aqr   | -10.0 | 1856.6 | 35° E  | 9        | -       | -       | 09:38 | 15:00   | 20:31 |
|                | 23   | 3 37.6  | 16 56.9  | Tau   | -12.1 | 1807   | 113° E | 70       | -       | -       | 12:30 | 20:00   | 03:38 |
|                | 30   | 10 00.2 | 16 50.8  | Leo   | -12.7 | 1908.2 | 164° W | 98       | -       | -       | 19:09 | 02:10   | 08:58 |
| <b>Mercury</b> | 2    | 19 25.1 | -24 08.7 | Sgr   | -0.8  | 4.9    | 8° E   | 97       | 0.43    | 1.38    | 07:56 | 12:26   | 16:56 |
|                | 9    | 20 14.1 | -21 59.0 | Cap   | -0.8  | 5.2    | 12° E  | 93       | 0.39    | 1.30    | 08:07 | 12:47   | 17:28 |
|                | 16   | 20 59.9 | -18 38.2 | Cap   | -0.7  | 5.8    | 16° E  | 82       | 0.35    | 1.17    | 08:10 | 13:05   | 18:00 |
|                | 23   | 21 36.7 | -14 35.3 | Cap   | -0.5  | 6.8    | 19° E  | 60       | 0.32    | 1.00    | 08:02 | 13:12   | 18:24 |
|                | 30   | 21 52.6 | -11 15.9 | Cap   | 0.7   | 8.3    | 16° E  | 28       | 0.31    | 0.81    | 07:36 | 12:58   | 18:20 |
| <b>Venus</b>   | 2    | 17 23.9 | -22 33.6 | Oph   | -3.8  | 10.8   | 20° W  | 94       | 0.72    | 1.56    | 05:47 | 10:23   | 14:59 |
|                | 9    | 18 01.9 | -23 07.0 | Sgr   | -3.8  | 10.7   | 19° W  | 95       | 0.73    | 1.59    | 06:00 | 10:34   | 15:08 |
|                | 16   | 18 40.1 | -23 05.8 | Sgr   | -3.8  | 10.5   | 17° W  | 96       | 0.73    | 1.61    | 06:10 | 10:44   | 15:19 |
|                | 23   | 19 18.1 | -22 29.9 | Sgr   | -3.8  | 10.4   | 15° W  | 97       | 0.73    | 1.63    | 06:18 | 10:55   | 15:32 |
|                | 30   | 19 55.6 | -21 20.4 | Sgr   | -3.8  | 10.3   | 14° W  | 97       | 0.73    | 1.65    | 06:22 | 11:05   | 15:47 |
| <b>Mars</b>    | 2    | 1 41.9  | 11 31.1  | Psc   | -0.2  | 10.3   | 106° E | 89       | 1.51    | 0.91    | 11:53 | 18:38   | 01:24 |
|                | 9    | 1 53.8  | 12 45.2  | Ari   | 0.0   | 9.6    | 102° E | 89       | 1.52    | 0.97    | 11:33 | 18:23   | 01:13 |
|                | 16   | 2 06.7  | 14 00.3  | Ari   | 0.1   | 9.0    | 98° E  | 89       | 1.53    | 1.04    | 11:13 | 18:08   | 01:03 |
|                | 23   | 2 20.3  | 15 15.2  | Ari   | 0.3   | 8.5    | 95° E  | 89       | 1.54    | 1.10    | 10:54 | 17:54   | 00:54 |
|                | 30   | 2 34.6  | 16 28.9  | Ari   | 0.4   | 8.0    | 91° E  | 89       | 1.55    | 1.17    | 10:36 | 17:41   | 00:46 |
| <b>1 Ceres</b> | 2    | 23 10.0 | -15 31.0 | Aqr   | 9.2   | 0.4    | 61° E  | 98       | 2.95    | 3.30    | 11:01 | 16:06   | 21:12 |
|                | 9    | 23 18.0 | -14 23.9 | Aqr   | 9.2   | 0.4    | 56° E  | 98       | 2.95    | 3.38    | 10:37 | 15:46   | 20:57 |
|                | 16   | 23 26.3 | -13 15.3 | Aqr   | 9.2   | 0.4    | 51° E  | 98       | 2.95    | 3.46    | 10:13 | 15:27   | 20:42 |
|                | 23   | 23 34.9 | -12 05.4 | Aqr   | 9.3   | 0.4    | 47° E  | 98       | 2.94    | 3.53    | 09:50 | 15:08   | 20:27 |
|                | 30   | 23 43.7 | -10 54.6 | Aqr   | 9.2   | 0.3    | 42° E  | 99       | 2.94    | 3.59    | 09:26 | 14:50   | 20:13 |
| <b>Jupiter</b> | 2    | 20 21.7 | -19 57.7 | Cap   | -1.8  | 32.8   | 21° E  | 100      | 5.10    | 6.00    | 08:31 | 13:18   | 18:05 |
|                | 9    | 20 28.4 | -19 35.3 | Cap   | -1.8  | 32.6   | 16° E  | 100      | 5.09    | 6.03    | 08:08 | 12:57   | 17:46 |
|                | 16   | 20 35.1 | -19 11.7 | Cap   | -1.8  | 32.5   | 10° E  | 100      | 5.09    | 6.06    | 07:46 | 12:36   | 17:27 |
|                | 23   | 20 41.9 | -18 47.0 | Cap   | -1.8  | 32.4   | 5° E   | 100      | 5.09    | 6.07    | 07:23 | 12:15   | 17:07 |
|                | 30   | 20 48.7 | -18 21.4 | Cap   | -1.8  | 32.4   | 1° W   | 100      | 5.09    | 6.07    | 07:01 | 11:55   | 16:48 |
| <b>Saturn</b>  | 2    | 20 16.3 | -20 09.0 | Cap   | 0.6   | 15.2   | 20° E  | 100      | 9.99    | 10.91   | 08:26 | 13:12   | 17:58 |
|                | 9    | 20 19.7 | -19 58.5 | Cap   | 0.6   | 15.1   | 14° E  | 100      | 9.99    | 10.94   | 08:01 | 12:48   | 17:35 |
|                | 16   | 20 23.1 | -19 47.6 | Cap   | 0.6   | 15.1   | 7° E   | 100      | 9.98    | 10.96   | 07:36 | 12:24   | 17:11 |
|                | 23   | 20 26.5 | -19 36.3 | Cap   | 0.6   | 15.1   | 1° E   | 100      | 9.98    | 10.97   | 07:11 | 12:00   | 16:48 |
|                | 30   | 20 30.0 | -19 24.8 | Cap   | 0.6   | 15.1   | 5° W   | 100      | 9.98    | 10.96   | 06:47 | 11:36   | 16:25 |
| <b>Uranus</b>  | 2    | 2 18.4  | 13 21.3  | Ari   | 5.7   | 3.6    | 115° E | 100      | 19.77   | 19.34   | 12:22 | 19:13   | 02:04 |
|                | 9    | 2 18.2  | 13 20.4  | Ari   | 5.7   | 3.6    | 108° E | 100      | 19.77   | 19.45   | 11:54 | 18:45   | 01:36 |
|                | 16   | 2 18.2  | 13 20.4  | Ari   | 5.8   | 3.6    | 101° E | 100      | 19.77   | 19.56   | 11:27 | 18:18   | 01:09 |
|                | 23   | 2 18.3  | 13 21.2  | Ari   | 5.8   | 3.6    | 94° E  | 100      | 19.77   | 19.68   | 10:59 | 17:50   | 00:41 |
|                | 30   | 2 18.6  | 13 22.9  | Ari   | 5.8   | 3.6    | 87° E  | 100      | 19.77   | 19.80   | 10:32 | 17:23   | 00:14 |
| <b>Neptune</b> | 2    | 23 19.4 | -5 32.7  | Aqr   | 7.9   | 2.3    | 67° E  | 100      | 29.93   | 30.30   | 10:32 | 16:14   | 21:57 |
|                | 9    | 23 19.9 | -5 29.2  | Aqr   | 7.9   | 2.2    | 60° E  | 100      | 29.93   | 30.41   | 10:05 | 15:47   | 21:30 |
|                | 16   | 23 20.5 | -5 25.0  | Aqr   | 7.9   | 2.2    | 53° E  | 100      | 29.93   | 30.51   | 09:38 | 15:21   | 21:03 |
|                | 23   | 23 21.2 | -5 20.5  | Aqr   | 7.9   | 2.2    | 46° E  | 100      | 29.93   | 30.60   | 09:11 | 14:54   | 20:37 |
|                | 30   | 23 22.0 | -5 15.4  | Aqr   | 8.0   | 2.2    | 39° E  | 100      | 29.93   | 30.69   | 08:44 | 14:27   | 20:10 |
| <b>Pluto</b>   | 2    | 19 45.4 | -22 26.7 | Sgr   | 14.4  | 0.2    | 12° E  | 100      | 34.19   | 35.15   | 08:05 | 12:41   | 17:17 |
|                | 9    | 19 46.4 | -22 24.9 | Sgr   | 14.4  | 0.2    | 6° E   | 100      | 34.20   | 35.18   | 07:38 | 12:14   | 16:51 |
|                | 16   | 19 47.4 | -22 22.9 | Sgr   | 14.4  | 0.2    | 2° W   | 100      | 34.20   | 35.19   | 07:12 | 11:48   | 16:24 |
|                | 23   | 19 48.4 | -22 21.1 | Sgr   | 14.4  | 0.2    | 8° W   | 100      | 34.21   | 35.18   | 06:45 | 11:21   | 15:58 |
|                | 30   | 19 49.3 | -22 19.2 | Sgr   | 14.4  | 0.2    | 15° W  | 100      | 34.21   | 35.16   | 06:18 | 10:55   | 15:31 |

## Astrophoto Gallery

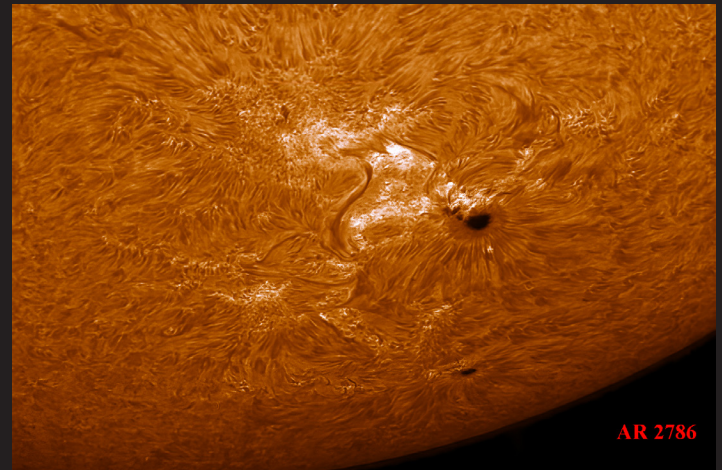
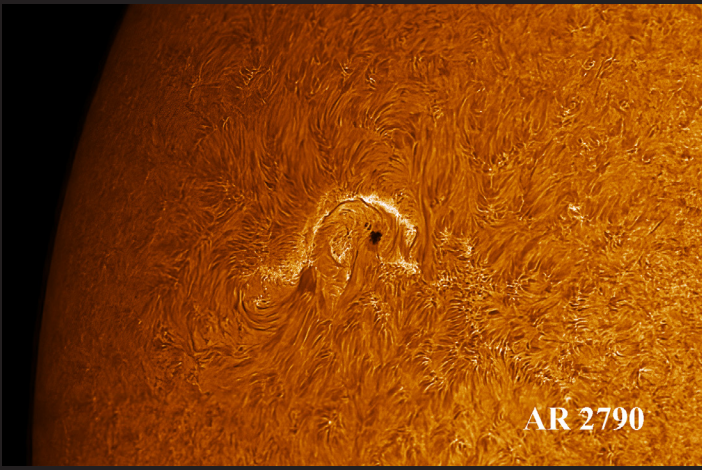
Hey friends,  
Well, I am happy that at least  
the skies cleared just in time  
for sunset to give us a brief  
window to see and/or image  
this rare celestial event. Jupi-  
ter and Saturn at 0.1 degrees  
apart and have not been this  
close since 1623. Here is my  
best capture from the lot. Glad  
I got to see it and image it.  
Ron Zincone



Attached is a stack of 250 video stills taken with a SONY SR12  
HD camcorder through a 40mm eyepiece. Meade LX6 8 inch  
f/10 2000mm fl. Stacked with Autostakkert 3 & Photoshop CS4.  
By Greg Shanow.



Conjunction of Jupiter & Saturn on December 22 by Steve Hubbard, left with telephoto lens, above with Canon camera and 6 inch APM refractor.



AR2786 and AR2790 by Jeff Padell

NGC253 the Silver Coin Galaxy, also known as the Sculptor galaxy. It is 10 million light years away and 70,000 light years across. I took this using the 17" Telescope at the SLOOH Observatory in Chile, using online access. By Jeff Padell



The Flame Nebula shot with Slooh Celestron 11" Astrograph, by Jeff Padell

# STARRY SCOOP

Editor: Kaitlynn Goulette



## WHAT'S UP

January 19th marks the 15-year anniversary of the New Horizons space probe launch. On July 14th, 2015, New Horizons flew by Pluto and its moons under the direction of Alan Stern, the principal investigator. It gave us our first close-up images of this dwarf planet. Four years later, the probe sped past Arrokoth, the Kuiper Belt object previously named Ultima Thule, at about 36,000 miles per hour. New Horizons has already sent pictures and is continuing to send data it collected about this contact binary to earth.

On the 2nd of January, the earth is at perihelion, which is when it is closest to the sun in its elliptical orbit. This occurs once a year and reminds us that the seasons are caused by the tilt of the earth's axis, not by how close it is to the sun.

The Quadrantid meteor shower runs from January 1st to the 5th. The peak occurs on the night of the 2nd and extends past midnight into the following morning. This shower produces up to 40 meteors per hour. The meteors radiate from the constellation Boötes but can be seen all over the sky. It is best viewed from a dark place after midnight.

On January 24th, Mercury reaches its greatest eastern elongation. This is one of the best times to observe Mercury in the evening sky because it will be at its highest above the horizon. Look for the planet low in the western sky just after the sun has set. Mercury will appear as the brightest star-like object.

With January's cold nights upon us, be sure to bundle up and view the winter stars,

including the asterism known as the Winter Hexagon, which dominates the heavens. The Winter Hexagon is comprised of six bright stars that form a hexagonal shape. They are Capella, Pollux, Procyon, Sirius, Rigel, and Aldebaran. Along with these stars, this region has many other brilliant stars that shine like diamonds in the sky. This area also contains many deep-sky objects for binoculars and telescopes, including nebulae, star clusters, galaxies, and binary stars. This is my favorite time of year to observe the sky because of the myriad things to see.

## JANUARY'S SKY

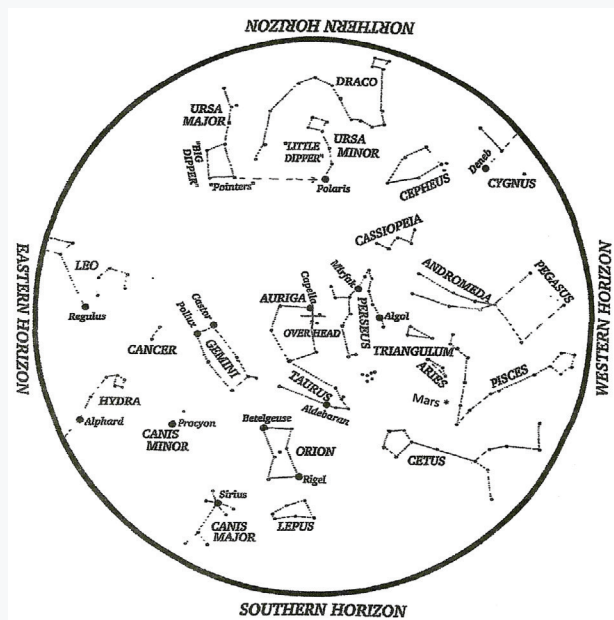
**2: Earth is at Perihelion**

**2-3: Quadrantid Meteor Shower Peak**

**13: New Moon**

**24: Mercury at Greatest Eastern Elongation**

**28: Full Moon**



Credit: Roger B. Culver

Hold star map above your head and align with compass points.



# OBSERVATIONS

Recently, my observations have been dominated by viewing Jupiter and Saturn as they were drawing closer together for their great conjunction. For weeks beforehand, I observed the progress they made and felt a sense of privilege witnessing firsthand the orbital motions of these two planets.

On December 21st, my father, sister, and I found ourselves on Rebecca Lobo Way in Southwick, MA with other STARS Club members to observe the conjunction. What appeared at first glance to be a single point of light, I was able to resolve into two separate heavenly bodies with my naked eye. Using our 8-inch F/5 Newtonian telescope at prime focus, I snapped images of this historic conjunction of Jupiter and Saturn with our Canon 450d DSLR camera and our ZWO 120MC planetary camera. After about 30 minutes of taking pictures, fog rolled in and put an end to our observations.

Even though the two gas giants appeared to be almost touching each other in the sky, they were actually 456 million miles apart! In other words, they were like two passing ships at sea, one far away and one close. Great conjunctions of Jupiter and Saturn occur about every 20 years, but the two planets rarely appear this close together. The last time was in 1226, and they won't be this close again until 2080.

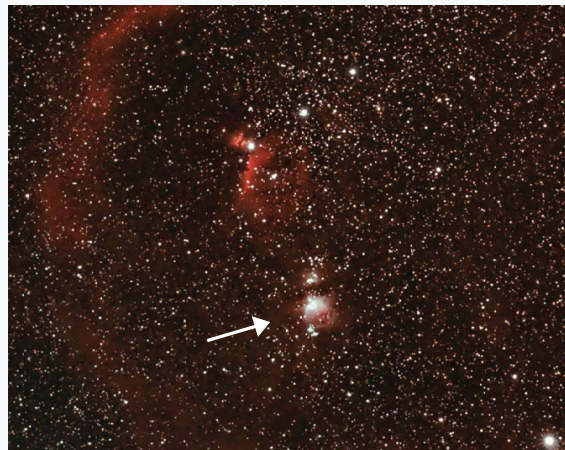


The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact [starryscoop@gmail.com](mailto:starryscoop@gmail.com). The Starry Scoop is now on Facebook. Clear skies!

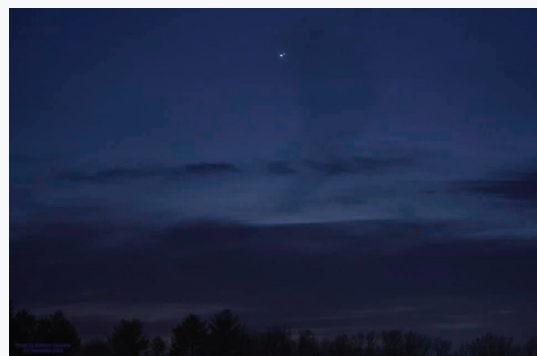
# OBJECT OF THE MONTH

The Orion Nebula (M42) is this month's featured object. Located just below Orion's belt, it is one of the brightest nebulae in the sky. At a distance of 1500 light-years, M42 is one of the closest regions of massive star formation to Earth. It's estimated to be about 24 light-years across and is made up of gas and dust. M42 can be seen with the unaided eye and looks like a fuzzy star. Binoculars and telescopes will reveal much more detail.

Within the nebula's central region lies the Trapezium. This asterism is made up of four bright stars that illuminate the Orion Nebula. These stars are very bright but very close together and can be resolved with a backyard telescope. Good luck!



The Orion Nebula  
Photo by Ashfield Astrophotography



Conjunction of Jupiter and Saturn  
Photo by Kaitlynn Goulette



# Quest for the Northern Lights

6 Nights • October 2 - 8, 2021

**Presented by Skyscrapers Inc.**

## Package Inclusions:

- Roundtrip air from Boston
- Arrival & departure transfers in Iceland
- 5-night hotel accommodations
- 12 Meals: 6 breakfasts, 2 lunches & 4 dinners
- Local guide and sightseeing as scheduled
- Multiple Northern Lights excursions
- Services of a AAA Host

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# Itinerary:

B = Breakfast, L = Lunch, D = Dinner

**Day 1: October 2, 2021** - Overnight Flight to Reykjavik

**Day 2: October 3, 2021** - Get ready for a full day of exploring as you are introduced to the amazing country of Iceland. You'll be greeted by our tour guide who will lead us to our private motor coach. The first stop is breakfast and then we're off to the capital to begin touring. Take in all the city's major attractions, including: Parliament, National Museum, Höfði house and much more. Then we will visit the Aurora Museum where we learn about this phenomenon and how other countries around the world connect with it. This evening we dine together, followed by a Northern lights cruise, if weather permits. **B, D**

**Day 3: October 4, 2021** - Enjoy breakfast before an independent visit to the Reykjavik Museum of Photography. The museum features a collection of approximately six million photographs with some dating back as early as 1860. In the afternoon, we will rejoin our guide and visit the National Museum. This evening brings us to Perlan - Wonders of Iceland, where visitors can experience Iceland's many natural wonders all in one place. Later, venture to the top floor of Perlan and dine under a glass dome while enjoying an incredible 360° view. **B, D**

**Day 4: October 5, 2021** - The day is yours to create your own Icelandic story. This evening, join the local astronomy society for a visit at their observatory in Grotta. **B**

**Day 5: October 6, 2021** - After breakfast, we drive through the fertile farmlands of Southern Iceland toward its majestic mountains and beautiful waterfalls. Visit the Lava Centre to experience a high-tech educational exhibit depicting volcanic activity, earthquakes and the creation of Iceland. The famous Iceland Lava show is also included during our visit. This evening we will enjoy dinner at the hotel before heading out for a Northern Lights hunt on foot with our guide. Included Meals: **B, L, D**



**Day 6: October 7, 2021** - We'll enjoy a full-day tour of southwest Iceland today, which includes three of Iceland's best-known attractions: Gullfoss, one of the most impressive waterfalls in Europe, with its icy water thundering majestically into a deep canyon; the Geysir Hot Springs, featuring a numerous geysers, including the 30-meter spouting world-known Strokkur; and a visit with lunch at Friðheimar tomato greenhouse. We will also get to see a demonstration of the famed five gaits unique to the Icelandic horse. Dinner is included this evening before we head out for one last attempt to see the Northern Lights. Included Meals: **B, L, D**

**Day 7: October 8, 2021** - This morning we travel back to the airport but not before a visit to the famous Blue lagoon. The lagoon is a unique formation with pleasantly warm, mineral-rich geothermal water in the middle of a black lava field. Enjoy a swim with an included silica mask during your visit before departing to Keflavík International Airport for your flight home. Included Meals: **B**

\*Rate is per person, based on double occupancy for October 2 2021 departure including roundtrip air from Boston and includes government-imposed fees and taxes which are subject to change without notice. Additional airline restrictions, including, but not limited to baggage fees (See iflybags.com for specific details). Please contact the airline directly for details and questions. Fuel surcharges and any other applicable vendor surcharges are additional. Rate shown is current at time of print, capacity controlled, subject to availability and valid on new bookings only. AAA reserves the right to change or cancel itineraries whenever it is deemed necessary. If any changes occur, every effort will be made to offer other comparable package components. Trip Cancellation Insurance is strongly recommended. A valid U.S. passport with a validity date at least 6 months after return date is required for U.S. Citizens traveling outside the United States. AAA does not assume responsibility for any errors or omissions in the content of the offers displayed. Other restrictions and conditions may apply.

# 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