



# the Skyscraper

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February 2020

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

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## Saturday, February 1, 6:00pm at North Scituate Community House

### Observing the Moon by Rich Nugent

When you think back to the very first night you observed with your very first telescope you might remember the very first celestial object you turned to. It was the moon, wasn't it? And you LOVED the moon! You observed it every chance you had. Then, something happened. Maybe it was the lure of deep sky objects that turned you away from your first love. Now, some of you absolutely hate the moon and that's not right.

Last year we celebrated the 50th anniversary of man's first steps on the moon and our nearest celestial neighbor received much publicity. Maybe you took some time to view the moon again. If not, Perhaps now is time to reacquaint yourself with Luna. Rich Nugent's talk on lunar observing offers a gentle reminder of the joy of lunar observing—telescopically or just from your armchair. Please join him at the February meeting of the Skyscrapers of Rhode Island!

Rich Nugent has been enjoying amateur astronomy for over 50 years. Rich has been a member of the ATMob since 1992 and currently serves as the organization's Vice President and the outreach program's chairperson. Having retired in 2016, he spends much of his time spoiling his grandchildren and observing the heavens. Rich is an experienced, visual observer who enjoys viewing a wide range of objects through his many telescopes.

**Skyscrapers  
Board Meeting**  
Saturday, February 8, 2pm  
at Ladd Observatory  
All Members Welcome

## Phases of the Moon

**First Quarter Moon**  
February 2 01:42

**Full Snow Moon**  
February 9 07:33

**Last Quarter Moon**  
February 15 22:17

**New Moon**  
February 23 15:32



Seagrave Memorial Observatory  
Open Nights

Saturdays at 7:00 pm  
weather & conditions permitting

# Leap Year

by Francine Jackson

Thirty days hath September. . .

I'm sure you all know the rest. We've made a calendar of 365 days to (kind of) conform to the Earth's revolution period. However, unfortunately, science and humankind sometimes don't come together as easily as we'd like. We actually travel around the Sun just about every 365.2422 days. What to do?

Julius Caesar, while enjoying life with Cleopatra, mandated that every four years an extra day must be added. He placed it at the end of February, which, legend says had been shortened by some of his relatives, whose commemorative months only had thirty days, and they wanted to have 31, also.

Unfortunately, this addition of a day every four years became a problem for the Catholic Church 1 ½ millennia later, when the first day of spring - the vernal equinox - made the feast of Easter in the wrong time frame. The Pope at that time, Gregory XIII, tweaked the calendar by disposing of ten days in October, 1582, then dropped leap days in all century years not divisible by 400. 2000 was a leap year, but 2100, 2200, and 2300 will not. It's still not a perfect system, but it's better, and closer to actuality.

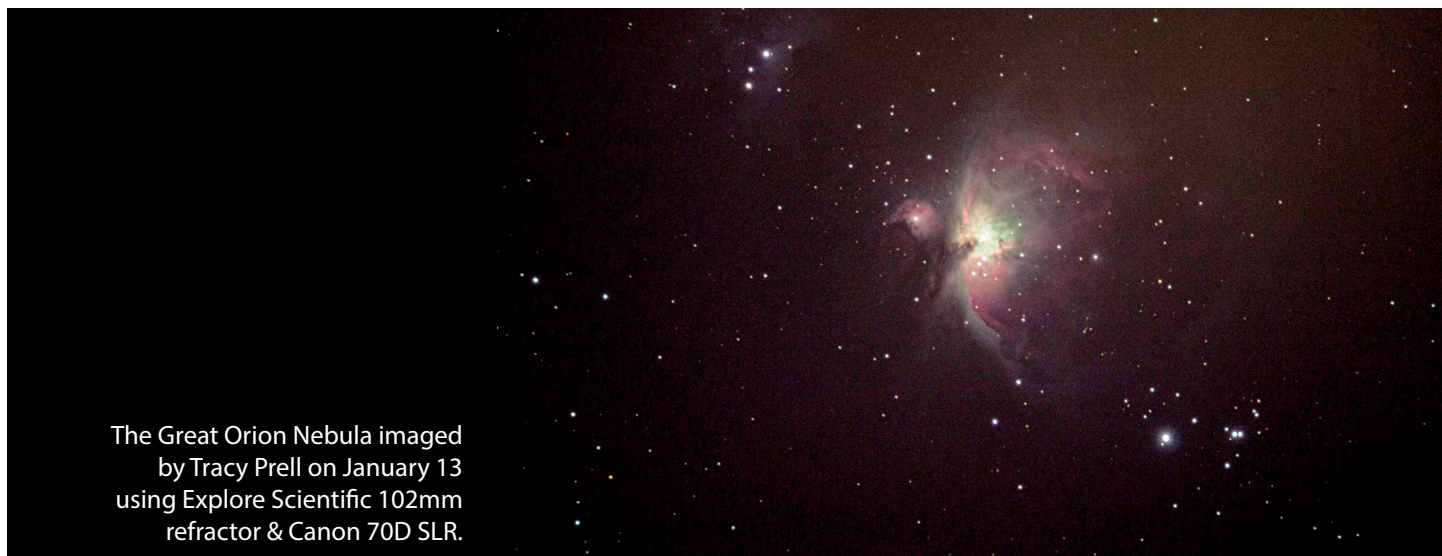
Incidentally, speaking of the calendar: I'm sure you all are aware of the coincidence of the number of days in each month and the knuckles on your fist? If the knuckle

at your first finger represents January, the space next to it is February. The middle finger knuckle is for March, the next space belongs to April. May is the third knuckle, followed by June's space, then July's knuckle. Run out of hand? Go back to "January," and continue through December.



*Francine Jackson is a NASA Solar System Ambassador, writes the weekly newsletter for Ladd*

*Observatory and teaches astronomy at the Community College of Rhode Island. See more at <http://theskyscrapers.org/francine-jackson>*



The Great Orion Nebula imaged by Tracy Prell on January 13 using Explore Scientific 102mm refractor & Canon 70D SLR.



*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 **February 15** to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to [jim@distantgalaxy.com](mailto: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](mailto:jim@distantgalaxy.com). Note that you will no longer receive the newsletter by postal mail.

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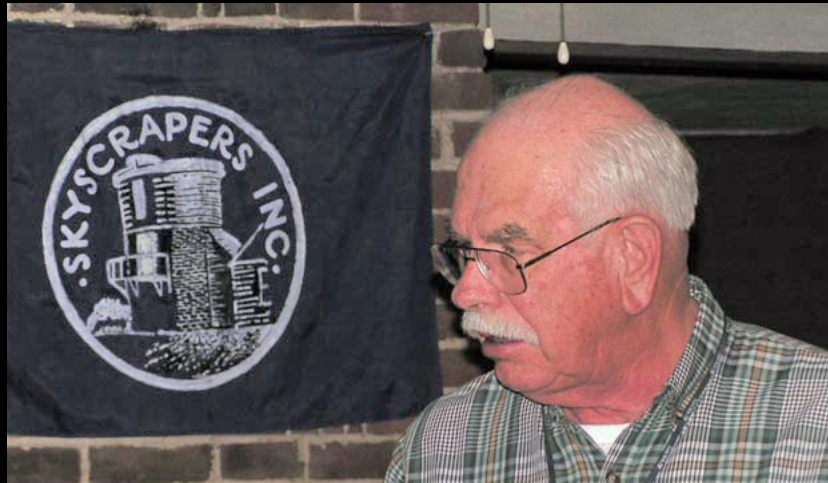
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# William S. Penhallow

1933 - 2020

by Francine Jackson



A major force in astronomy in Rhode Island has left us: William Scott “Bill” Penhallow died January 15, 2020, at age 86. As Astronomy Professor at URI for over 35 years, he was the inspiration to many of us. With my story: Bill allowed me to cover his classes when he was unavailable, resulting in my teaching at URI for many years; Bill alerted me to the need for readers at INSIGHT, the Rhode Island Association for the Blind, where I now have been a volunteer for almost forty years; he allowed me to be a part of a new instrument system he was co-inventing in the ‘80s; Bill introduced me to the planetarium on campus, where for decades I performed programs for the students, local school children, and the general public; finally, when I assumed the directorship of Frosty Drew Observatory, a facility he designed, helped build, and was a factor in its early educational programming, Bill came to our open house to let me know that, when he learned a woman was going to take the role, he knew that only one could be willing, and capable, of doing so.

Bill held two Science Faculty Fellowships from the National Science Foundation to study astronomy at Indiana University, and spent sabbaticals at Brown, Yale, and Wesleyan universities.

Bill was also a factor in the study of the Newport Tower, determining alignments never before realized, leading many to believe that, of its many possibilities, the tower could have been an astronomical structure.

In addition to his professional duties, Bill was a lifelong amateur astronomer, a member of Skyscrapers, Inc., at one point serving as its president. He was also a member of the American Astronomical Society and the American Association of Variable Star Observers. Bill also was a part of the Quonochontaug Yacht Club and its East Beach Association, chairman of the Chariho and Charlestown school committees, and Charlestown Town Moderator.

Bill is survived by his wife Nancy, his four sons and their families, a brother John, and many nieces and nephews. He is also leaving behind a legacy of Astronomy in Rhode Island that can never be equaled.



# Observing the Inner Solar System: Mercury and Venus

by Dave Huestis

When guests visit the local observatories, staff astronomers always look to impress them with great views of the Moon, Jupiter, Saturn and Mars when any of these worlds are observable. The wealth of detail visible through each facility's telescopes can awaken the sense of awe within children and adults alike. What child hasn't marveled at the Moon's vast craters? Who hasn't watched the parade of Jupiter's Gal-

ilean moons orbiting this gigantic planet and not thought about Galileo's first view of this phenomenal sight? We sky interpreters love to hear the oohs and aahs as folks get a glimpse of Saturn's magnificent rings for the first time. And when dust storms on Mars don't spoil the view of this desert-like world, who can't help but wonder if life may exist beneath its surface? Any night amateur astronomers can introduce casual

stargazers to these magnificent worlds is a wonderful experience.

However, while the afore-mentioned objects get most of the glory, there are two inferior planets of our solar system that are often neglected. No, they do not have any neuroses. Inferior is an astronomical term meaning these planets orbit between the Sun and the Earth. I'm referring to Mercury and Venus. Consequently, they do not stray far from the Sun in the sky from our Earthly perspective. Examine this brief video which explains what we observe: <https://www.youtube.com/watch?v=9wL9Lue4fyE> Whenever Mercury and Venus appear above either the eastern or western horizon these events are called elongations. Mercury can appear no more than a maximum of 28 degrees away from the Sun, while Venus can appear no more than a maximum of 48 degrees away from the Sun. Elevation above one's horizon varies from one elongation to another.

Throughout the year we have several opportunities to observe these worlds. Unfortunately, we cannot view the surfaces of either of these planets with a telescope, but telescopically we can observe each planetary disk as it goes through phases similar to that of our Moon. Because the position angle between the Earth, Sun and Mercury/Venus is constantly changing due to our orbital positions relative to one another, we see these two planetary disks change phases. Please review the graphic at the following website: [http://www.ifa.hawaii.edu/~barnes/ast110\\_06/rots/0520a.jpg](http://www.ifa.hawaii.edu/~barnes/ast110_06/rots/0520a.jpg). A picture is most definitely worth a thousand words.

Perhaps you've noticed a bright heavenly beacon high in the southwest sky after sunset since the beginning of the year. That's Venus. On February 1 the goddess of love will be about 30 degrees above the horizon. On that same evening much, dimmer Mercury will be less than 10 degrees above the west-southwest horizon. You'll require an unobstructed view to locate it. Through a telescope Venus' disk will be 73% illuminated, resembling a waxing gibbous Moon phase.

The waxing crescent Moon & Venus from Seagrave Observatory on December 28 by Jim Hendrickson.





Mercury's disk will be about 83% illuminated and will also resemble a waxing gibbous moon phase. Mercury will continue to rise higher into the sky each evening, being at its highest elevation above the horizon on the 10th. This date would be the optimum time to view the closest planet to the Sun. Its phase will then resemble that of a first quarter Moon. After this date Mercury will quickly sink back towards the western horizon and the Sun. Observing opportunities for Mercury are fairly short and are counted in weeks. Around March 1 Mercury will be seen in the morning sky before sunrise. On March 24 Mercury will be at its highest elevation above the eastern horizon.

After February 1 Venus will continue to rise higher and higher into the evening sky and away from the Sun and horizon. Venus's larger orbit results in the planet appearing much farther from the Sun in our sky than Mercury does. Therefore, observing opportunities for Venus are counted in months. On March 24 Venus will be at its greatest elongation from the Sun, and therefore at its highest point (about 40 degrees) above the horizon after sunset. The phase will now look like that of a first quarter Moon. Four days later on the 28th a waxing crescent Moon will be located about six degrees to the left of Venus. This sky scene will be a beautiful image to capture with a camera.

It is interesting to note that Venus has been approaching the Earth since superior conjunction (passing behind the Sun from our viewpoint) on August 14, 2019. As Venus draws closer to our planet the size of its planetary disk gets larger. See this website for a graphic that illustrates this progression: <https://en.es-static.us/upl/2019/10/venus-2019-2020-ottewell-north-lg.jpg>. By March 24, despite the waning phase, Venus' brightness will remain fairly constant because its larger apparent size compensates for the decreasing illumination.

In addition, if you know where to scan, you can even observe Venus in broad daylight, being careful not to stray too close to the Sun for eye safety. Use a building to block the Sun from direct view before beginning your sweep of the sky. However, it's best to observe Venus in early twilight before the sky darkens. Venus is so bright that too much contrast is a problem when observed in a dark sky. A small refracting telescope or even a scope used for bird watching will show Venus' changing phase. Check it out every couple of weeks or so.

After elongation Venus will begin to sink towards the horizon. It will still be coming towards us, all the time the phase will be decreasing to a smaller and smaller crescent. We'll lose sight of Venus by the end of May.

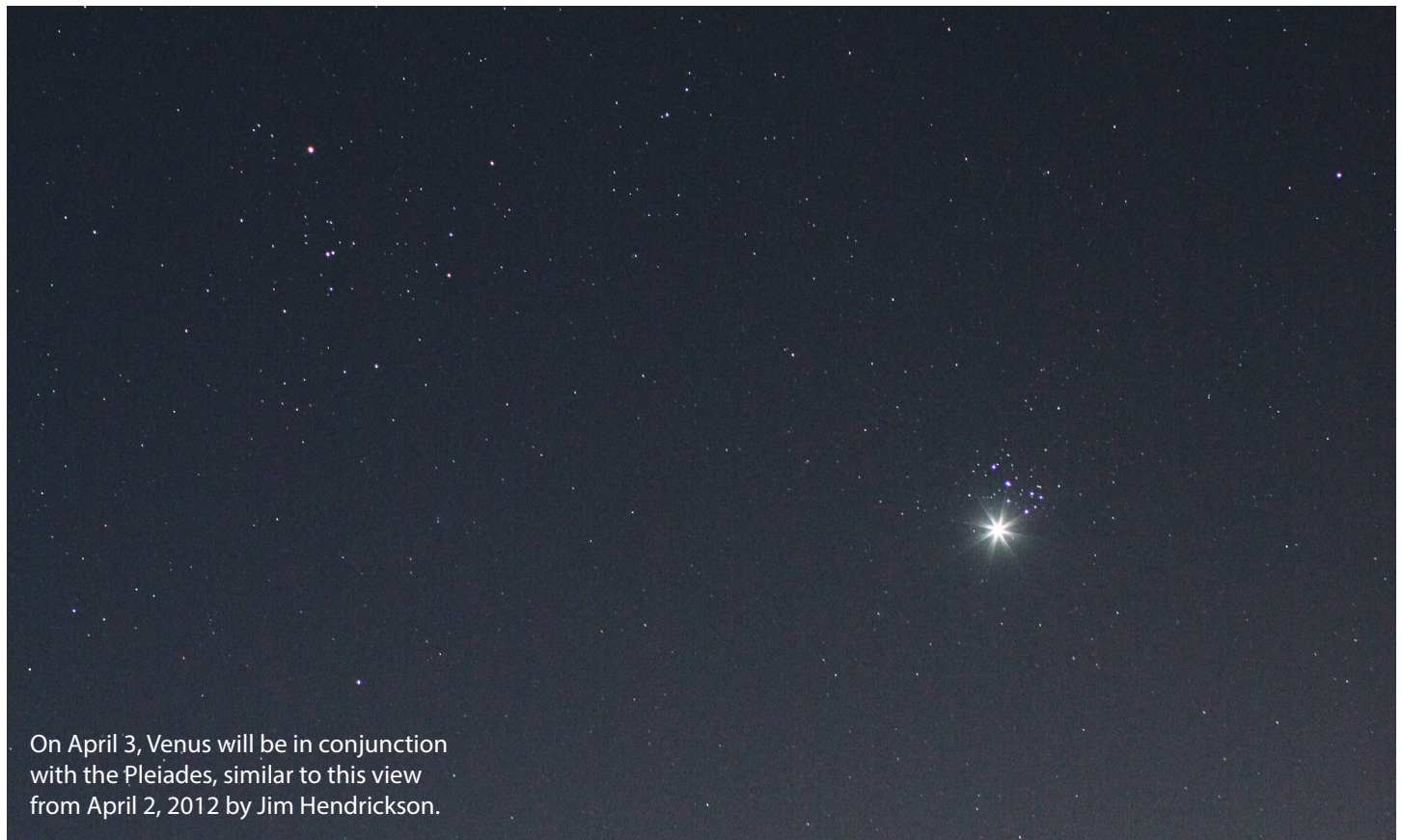
In conclusion, please remember, weather permitting, the local observatories remain open during the winter months to share beautiful views of the heavens. Snow, ice or below freezing temperatures can force closures, so please check the respective websites for any cancellation notices and observing schedules before venturing out for a visit. Seagrave Memorial Observatory (<http://www.theskyscrapers.org>) in North Scituate is open every clear Saturday night. Ladd Observatory (<http://www.brown.edu/Departments/Physics/Ladd/>) in Providence is open every clear Tuesday night. The Margaret M. Jacoby Observatory at the CCRI Knight Campus in Warwick (<http://www.ccri.edu/physics/observatory.htm>) is open every clear Wednesday night. Frosty Drew Observatory (<http://www.frostydrew.org/>) in Charlestown is open every clear Friday night.

I hope that Venus, the Roman goddess of love, will smile upon you and yours on Valentine's Day. Just be vigilant against any errant arrows from her son Cupid!

Clear skies to all.



*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>*



On April 3, Venus will be in conjunction with the Pleiades, similar to this view from April 2, 2012 by Jim Hendrickson.

# Betelgeuse and the Crab Nebula: Stellar Death and Rebirth

By David Prosper

What happens when a star dies? Stargazers are paying close attention to the red giant star **Betelgeuse** since it recently dimmed in brightness, causing speculation that it may soon end in a brilliant supernova. While it likely won't explode quite yet, we can preview its fate by observing the nearby **Crab Nebula**.

**Betelgeuse**, despite its recent dimming, is still easy to find as the red-hued shoulder star of Orion. A known variable star, Betelgeuse usually competes for the position of the brightest star in Orion with brilliant blue-white Rigel, but recently its brightness has faded to below that of nearby Aldebaran, in Taurus. Betelgeuse is a young star, estimated to be a few million years old, but due to its giant size it leads a fast and furious life. This massive star, known as a supergiant, exhausted the hydrogen fuel in its core and began to fuse helium instead, which caused the outer layers of the star to cool and swell dramatically in size. Betelgeuse is one of the only stars for which we have any kind of detailed surface observations due to its huge size – somewhere between the diameter of the orbits of Mars and Jupiter – and relatively close distance of about 642 light-years. Betelgeuse is also a “runaway star,” with its remarkable speed possibly triggered by merging with a small-

er companion star. If that is the case, Betelgeuse may actually have millions of years left! So, Betelgeuse may not explode soon after all; or it might explode tomorrow! We have much more to learn about this intriguing star.

The **Crab Nebula (M1)** is relatively close to Betelgeuse in the sky, in the nearby constellation of Taurus. Its ghostly, spidery gas clouds result from a massive explosion; a supernova observed by astronomers in 1054! A backyard telescope allows you to see some details, but only advanced telescopes reveal the rapidly spinning neutron star found in its center: the last stellar remnant from that cataclysmic event. These gas clouds were created during the giant star's violent demise and expand ever outward to enrich the universe with heavy elements like silicon, iron, and nickel. These element-rich clouds are like a cosmic fertilizer, making rocky planets like our own Earth possible. Supernova also send out powerful shock waves that help trigger star formation. In fact, if it wasn't for a long-ago supernova, our solar system – along with all of us – wouldn't exist! You can learn much more about the Crab Nebula and its neutron star

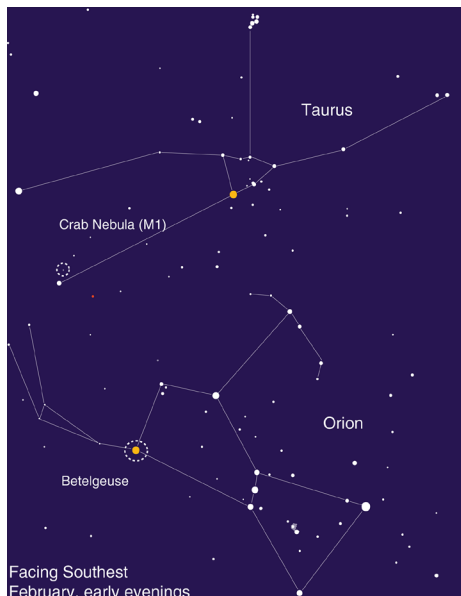
in a new video from NASA's Universe of Learning, created from observations by the Great Observatories of Hubble, Chandra, and Spitzer: [bit.ly/CrabNebulaVisual](http://bit.ly/CrabNebulaVisual)

Our last three articles covered the life cycle of stars from observing two neighboring constellations: Orion and Taurus! Our stargazing took us to the “baby stars” found in the stellar nursery of the Orion Nebula, onwards to the teenage stars of the Pleiades and young adult stars of the Hyades, and ended with dying Betelgeuse and the stellar corpse of the Crab Nebula. Want to know more about the life cycle of stars? Explore stellar evolution with “The Lives of Stars” activity and handout: [bit.ly/starlife-anddeath](http://bit.ly/starlife-anddeath) .

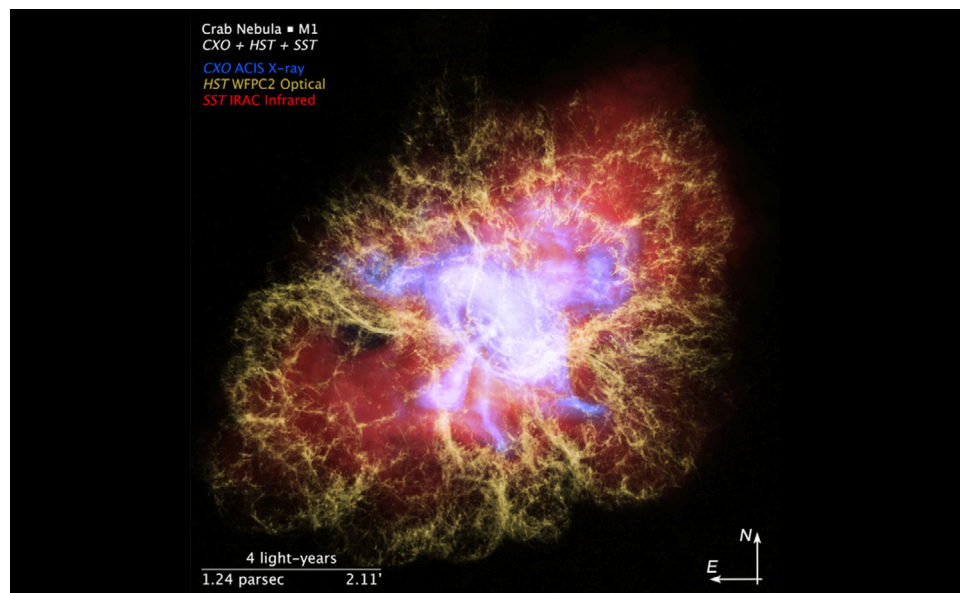
Check out NASA's most up to date observations of supernova and their remains at [nasa.gov](http://nasa.gov)



*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!*



Spot Betelgeuse and the Crab Nebula after sunset! A telescope is needed to spot the ghostly Crab.



This image of the Crab Nebula combines X-ray observations from Chandra, optical observations from Hubble, and infrared observations from Spitzer to reveal intricate detail. Notice how the violent energy radiates out from the rapidly spinning neutron star in the center of the nebula (also known as a pulsar) and heats up the surrounding gas. More about this incredible “pulsar wind nebula” can be found at [bit.ly/Crab3D](http://bit.ly/Crab3D) Credit: NASA, ESA, F. Summers, J. Olmsted, L. Hustak, J. DePasquale and G. Bacon (STScI), N. Wolk (CfA), and R. Hurt (Caltech/IPAC)



# The Sun, Moon & Planets in February

This table contains the ephemeris of the objects in the Solar System for each Saturday night in February 2020. 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>1</b>	20 56.1	-17 18.7	Cap	-26.8	1948.1	-	-	-	0.99	06:58	11:59	17:01
	<b>8</b>	21 24.4	-15 13.7	Cap	-26.8	1946.0	-	-	-	0.99	06:51	12:00	17:10
	<b>15</b>	21 52.0	-12 56.1	Cap	-26.8	1943.5	-	-	-	0.99	06:42	12:00	17:19
	<b>22</b>	22 19.1	-10 28.2	Aqr	-26.8	1940.6	-	-	-	0.99	06:32	11:59	17:27
	<b>29</b>	22 45.6	-7 52.3	Aqr	-26.8	1937.4	-	-	-	0.99	06:21	11:58	17:36
<b>Moon</b>	<b>1</b>	1 56.2	6 20.2	Psc	-11.5	1802.8	78° E	40	-	-	10:53	17:40	00:37
	<b>8</b>	8 16.5	21 29.0	Cnc	-12.7	1975.8	162° E	98	-	-	16:27	23:59	07:20
	<b>15</b>	14 52.0	-12 32.7	Lib	-12.2	1905.1	102° W	60	-	-	23:57	05:20	10:35
	<b>22</b>	21 09.3	-19 53.1	Cap	-8.6	1779.3	19° W	3	-	-	06:22	11:23	16:31
	<b>29</b>	2 26.8	9 39.6	Cet	-11	1796.5	58° E	24	-	-	09:20	16:19	23:27
<b>Mercury</b>	<b>1</b>	21 54.6	-13 59.4	Cap	-0.9	5.7	14° E	85	0.34	1.19	07:46	12:59	18:14
	<b>8</b>	22 32.9	-9 01.7	Aqr	-0.6	6.6	18° E	63	0.31	1.02	07:37	13:09	18:42
	<b>15</b>	22 52.6	-5 05.7	Aqr	0.5	8.1	17° E	31	0.31	0.83	07:14	12:58	18:43
	<b>22</b>	22 44.1	-4 18.4	Aqr	3.7	9.9	9° E	5	0.33	0.68	06:34	12:19	18:04
	<b>29</b>	22 17.6	-6 49.0	Aqr	4.9	10.7	7° W	3	0.37	0.63	05:49	11:25	17:00
<b>Venus</b>	<b>1</b>	23 31.7	-4 00.8	Aqr	-4	15.5	40° E	73	0.72	1.09	08:45	14:35	20:26
	<b>8</b>	0 01.5	-0 21.6	Psc	-4	16.2	42° E	71	0.72	1.04	08:34	14:37	20:41
	<b>15</b>	0 30.8	3 18.0	Psc	-4	17.0	43° E	69	0.72	1.00	08:23	14:39	20:56
	<b>22</b>	0 59.7	6 54.2	Psc	-4	17.9	44° E	66	0.72	0.95	08:11	14:40	21:10
	<b>29</b>	1 28.5	10 23.1	Psc	-4.1	18.9	44° E	63	0.72	0.90	08:00	14:41	21:24
<b>Mars</b>	<b>1</b>	17 13.9	-23 00.2	Oph	1.4	4.8	52° W	93	1.55	1.95	03:43	08:16	12:50
	<b>8</b>	17 34.6	-23 23.5	Oph	1.3	4.9	54° W	93	1.54	1.89	03:38	08:10	12:42
	<b>15</b>	17 55.6	-23 36.8	Sgr	1.3	5.1	57° W	92	1.54	1.84	03:32	08:03	12:34
	<b>22</b>	18 16.6	-23 40.0	Sgr	1.2	5.3	59° W	92	1.53	1.78	03:26	07:56	12:27
	<b>29</b>	18 37.7	-23 33.0	Sgr	1.1	5.4	61° W	91	1.52	1.72	03:18	07:50	12:22
<b>1 Ceres</b>	<b>1</b>	20 14.3	-24 41.5	Cap	9.0	0.3	12° W	100	2.93	3.89	06:50	11:16	15:42
	<b>8</b>	20 26.2	-24 14.1	Cap	9.1	0.3	16° W	100	2.93	3.87	06:32	11:00	15:29
	<b>15</b>	20 38.0	-23 44.7	Cap	9.1	0.3	21° W	100	2.94	3.84	06:14	10:44	15:15
	<b>22</b>	20 49.6	-23 13.7	Cap	9.2	0.3	25° W	99	2.94	3.81	05:56	10:28	15:01
	<b>29</b>	21 00.9	-22 41.4	Cap	9.2	0.3	29° W	99	2.94	3.77	05:37	10:12	14:48
<b>Jupiter</b>	<b>1</b>	18 59.4	-22 41.7	Sgr	-1.7	32.4	28° W	100	5.22	6.07	05:26	10:01	14:36
	<b>8</b>	19 05.8	-22 32.7	Sgr	-1.7	32.7	34° W	100	5.21	6.01	05:04	09:40	14:15
	<b>15</b>	19 12.1	-22 23.0	Sgr	-1.8	33.1	39° W	100	5.21	5.94	04:42	09:18	13:55
	<b>22</b>	19 18.1	-22 13.0	Sgr	-1.8	33.6	45° W	100	5.21	5.86	04:20	08:57	13:34
	<b>29</b>	19 23.8	-22 02.7	Sgr	-1.8	34.0	51° W	99	5.21	5.78	03:57	08:35	13:13
<b>Saturn</b>	<b>1</b>	19 47.9	-21 06.4	Sgr	0.6	15.1	17° W	100	10.03	10.97	06:07	10:49	15:31
	<b>8</b>	19 51.3	-20 58.1	Sgr	0.6	15.1	23° W	100	10.03	10.93	05:42	10:25	15:07
	<b>15</b>	19 54.6	-20 49.9	Sgr	0.6	15.2	29° W	100	10.03	10.88	05:17	10:00	14:43
	<b>22</b>	19 57.7	-20 41.8	Sgr	0.7	15.3	35° W	100	10.03	10.82	04:52	09:36	14:20
	<b>29</b>	20 00.7	-20 33.9	Sgr	0.7	15.4	42° W	100	10.03	10.74	04:27	09:11	13:56
<b>Uranus</b>	<b>1</b>	2 03.2	12 00.4	Ari	5.8	3.5	81° E	100	19.81	19.94	10:17	17:03	23:49
	<b>8</b>	2 03.8	12 03.6	Ari	5.8	3.5	74° E	100	19.81	20.06	09:50	16:36	23:22
	<b>15</b>	2 04.5	12 07.6	Ari	5.8	3.5	67° E	100	19.81	20.17	09:23	16:09	22:56
	<b>22</b>	2 05.3	12 12.4	Ari	5.8	3.5	61° E	100	19.81	20.28	08:56	15:42	22:29
	<b>29</b>	2 06.3	12 17.8	Ari	5.8	3.5	54° E	100	19.81	20.38	08:29	15:16	22:03
<b>Neptune</b>	<b>1</b>	23 14.0	-6 02.4	Aqr	8.0	2.2	36° E	100	29.93	30.73	08:34	14:14	19:55
	<b>8</b>	23 14.9	-5 56.8	Aqr	8.0	2.2	29° E	100	29.93	30.79	08:07	13:47	19:28
	<b>15</b>	23 15.8	-5 51.1	Aqr	8.0	2.2	22° E	100	29.93	30.85	07:40	13:21	19:02
	<b>22</b>	23 16.8	-5 45.1	Aqr	8.0	2.2	15° E	100	29.93	30.89	07:13	12:54	18:36
	<b>29</b>	23 17.7	-5 39.0	Aqr	8.0	2.2	8° E	100	29.93	30.91	06:46	12:28	18:10
<b>Pluto</b>	<b>1</b>	19 41.6	-22 05.7	Sgr	14.4	0.2	18° W	100	33.97	34.91	06:05	10:42	15:20
	<b>8</b>	19 42.5	-22 04.1	Sgr	14.4	0.2	25° W	100	33.98	34.87	05:38	10:16	14:53
	<b>15</b>	19 43.4	-22 02.6	Sgr	14.4	0.2	32° W	100	33.98	34.82	05:11	09:49	14:27
	<b>22</b>	19 44.3	-22 01.2	Sgr	14.4	0.2	39° W	100	33.99	34.75	04:45	09:22	14:00
	<b>29</b>	19 45.1	-22 00.0	Sgr	14.4	0.2	46° W	100	33.99	34.68	04:18	08:56	13:34

# Reports: November-January

## **Skyscrapers Monthly Meeting- Friday November 1, 2019 @ Seagrave Observatory 7 PM**

(About 40 people in attendance)

1. Welcome by President Steve Hubbard  
2. Steve thanked all who had helped make AstroAssembly 2019 a success.

3. Upcoming Events:

Holiday Meeting Dec 14th @ 5pm This will be a pot luck followed by speaker John Kocur.

The Observatory will be open on Saturday if it is clear

A Transit of Mercury will take place on the morning of Nov 11th and Seagrave will be open if clear.

1. Bob announced the results of a survey of those attending the meeting. The survey asked if people had observed total solar eclipses and other astronomical events (transits, comets). 13 people responded

2. Our webmaster, Jim Hendrickson was presented with an Award for Best Webmaster in 2019 by Astronomical League. Three other webmasters had been nominated.

3. A possible trip to Iceland the view auroras for Skyscrapers was introduced by AAA travel agent Michelle M. The trip would be scheduled for October of 2020. She will provide additional information as it becomes available.

4. The meeting was adjourned, followed by speaker Kim Arcand talked about 50 years of results from the Chandra orbiting X-ray telescope.

We also welcomed a newly formed Astronomy club from LaSalle Academy and gave tours of the Clark.

Submitted by Kathy Siok, Secretary

## **Monthly Meeting Skyscrapers Inc Saturday December 13, 2019 @ 7 PM North Scituate Community House**

The evening began with a Holiday Pot Luck Dinner at 5 PM. About 30 people attended.

1. The meeting was called to order at 7 PM by President Steve Hubbard, who welcomed everyone.

2. The next few meetings will be held on the first Saturday of the month ( January 4th, February 1st, March 7th) at the North Scituate Community Center from 6 – 8 PM.

3. The Observatory will be open to the public on Saturday nights if the temperature is not expected to get below 25F. Check

the website if in doubt.

4. Many thanks to the Trustees who have completed work on the observatories roofs.

5. Skyscrapers will start the process to hold an election in April. If anyone is interested in running for an office, please talk to one of the executive committee members.

6. The Geminid Meteor Shower will peak in one week.

The meeting was followed by a review of NASA's Apollo Lunar Module by John Kocur.

Submitted by Kathy Siok, Secretary

## **Skyscraper Monthly Meeting January 4, 2020**

### **North Scituate Community House**

About 20 people were in attendance.

The meeting was called to order at 6PM by President Steve Hubbard.

The next Monthly Meeting will take place on Saturday, February 1 at the North Scituate Community House (6-8PM). The speaker will be Rich Nugent whose presentation is about The Moon.

Everyone is welcome to attend the next Executive Committee Meeting on Saturday, January 11 @2PM @ Ladd Observatory in Providence.

Steve Hubbard thanked all the members who generously donated to our very successful fall fundraiser.

Report from the Trustees: There have been many improvements made to the buildings and grounds in the last few months, thanks to the hard work of our Trustees. The next priority is to facilitate the automation of the telescopes by running cables from the observatories to the meeting hall. The Clark pulley system has also been repaired with the help of Jim Brenek.

The business meeting was followed by a presentation about meteorites by Jeff Padell. Jeff and Steve Hubbard also brought some of their personal collections of meteorites to display.

Submitted by Kathy Siok, Secretary

## **Skyscraper Executive Committee Meeting**

### **Saturday, January 11, 2020 @ Ladd Observatory @ 2PM**

Present: Steve Hubbard, Jim Hendrickson, Kathy Siok, Lloyd Merrill, Linda Bergemann, Tracy Prell, Jim Crawford, Jeff Padell, Bob Horton, Bob Janus, Bob Napier,

Steve Siok

1. While our treasurer was not present, he sent a year to date report. Our finances are doing well.

2. Trustees: Priority work has been mostly completed. Current work is planned to set up remote access of the telescopes from the meeting hall. In the spring painting and other cosmetic work will be done.

3. A motion was made to purchase 2 laptops to be used for remote access at a cost of about \$1000. It was seconded and after discussion was approved unanimously.

4. Executive Committee meetings scheduled for the second Saturday of the month. Feb 8 meeting will meet at Ladd starting at 2:30.

5. Special Events Planning:

A. Astronomy Day (Officially on Saturday, May 2) will be organized by Linda Bergemann. There was a discussion of the intended audience – public or members. Options were to have some afternoon speakers and a star party in the evening. There is a food truck (Seagrave neighbor's ) that would be available. More will be discussed at a later meeting.

B. In the Fall, there will opportunities to observe the opposition of Mars and to view other planets

Ideas: Field trip to Van Vleck Observatory in CT to view – showing of "War of the Worlds"

6. 2020 Elections: Many new officers will be needed this year.

Nominating Committee was appointed: Kathy & Steve Siok, Bob Horton volunteered

Timeline: Feb Meeting – announce committee: March Meeting – present nominations

Email should be sent out to all members telling them that nominations are open. A description of each office / duties should also be provided. Kathy will write this email and send it to the executive committee for comment before sending it to members.

7. Open Night Schedule for 2020

The Trustees will have 2 teams of 5 volunteers, one for the 1st and 3rd planned Saturday Sessions.

The 2nd and 4th Saturdays will be staffed by volunteers from the Observatory Committee. The 5th Saturday will be a members' night.

Discussed were:



A. organizing the open nights so that each team is using the Observing Cards (provided by Linda) to provide views of opportune objects to the public and to explain some of the details about observing and what they are viewing.

B. Operate the planned sessions unless the observatory grounds are not in good shape. Show videos in the meeting hall and hold sessions to explain simple astronomical facts to the public who attends. Also some streaming of remote telescopes could be useful.

C. The team would meet prior to starting the observing session to decide which objects are best viewed through each telescope.

D. The Observatory Committee would attend a training session for this.

8. The Skyscraper website was discussed briefly. Steve Hubbard has investigated moving our site over to the same people as used by ATMs of Boston. They would take care of all the changes, posting and details. The upfront cost would be about \$1000, with an annual fee of about \$400. There would be enhanced possibilities with this new option.

9. Bob Napier recounted some feedback from Scituate townspeople concerning the perceived lack of visibility of Skyscrapers in the town. What followed was a discussion of ways that might remedy that problem. The discussion included: a presence at the Art Festival, information available in the town Library, Library Telescope program in Scituate, Better communication between Skyscrapers and the town officials via email, newsletter, Facebook, school contacts and mentoring. Kathy volunteered to coordinate a plan to expand our footprint in Scituate and in general using a variety of methods. Tracy will help with electronic media. Bob Napier will be speaking to the Library and Kathy will follow up. Bob N will also try to find out more about this issue with townspeople.

Bob Horton suggested that we issue an invitation to the townspeople to attend our February meeting on The Moon and hold an observing session after the meeting.

10. Kathy suggested that every small non-profit suffers from not being visible enough to people. She suggested that we publish an Annual Report each year, giving statistics about how many things we do and numbers of people reached during that year. Steve Hubbard will start some work on this.

This should be useful for helping with

grants.

11. Lloyd mentioned that his radio club has gotten many new members by offering them opportunities to become active as soon as they join. Tracy, as New Member Steward, explained how she reaches out to new members to offer them a view of opportunities in the group.

12. Bob Napier suggested that we should expand the Report section of our monthly Business meeting so that the attendees know what astronomy members are doing.

13. The Iceland Trip run by AAA now has 3 people signed up. It must attract a minimum of 20 people to happen. The representative will attend the Feb meeting to try to drum up some interest. Are people outside Skyscrapers invited to attend and why not?

14. The meeting ended at 4PM. Discussions will be continued at the next executive board meeting.

Submitted by: Kathy Siok, Secretary

SKYSCRAPERS INC. FISCAL YEAR 2019-2020  
BUDGET & YTD Totals 01-08-20

Category	Budget	YTD Totals	Delta
<b>INCOME</b>			
AstroAssembly	4,000	3,934	(66)
Dues	3,100	3,400	300
AL Membership	90	90	0
Donations	1,300	7,340	6,040
Sale of Equipment	100	140	40
Star Party Donations	300	150	(150)
Transfer from Savings/CD	2,035	0	(2,035)
<b>TOTAL INCOME</b>	<b>10,925</b>	<b>15,054</b>	<b>4,129</b>
<b>EXPENSES</b>			
Astro Assem Exp	1,450	1,234	216
AL Membership Exp	100	100	0
Contingency	258	35	223
Corporation, State Fee	22	22	0
Domain Name	20	156	(136)
Donation	50	0	50
PayPal Fees	50	67	(17)
Outreach	300	0	300
Postage and Delivery	75	11	64
Property Insurance	2,500	2,594	(94)
Refreshment Expense	200	77	123
Trustee Expense	3,500	6,087	(2,587)
Utilities	2,400	2,216	184
<b>TOTAL EXPENSES</b>	<b>10,925</b>	<b>12,599</b>	<b>(1,674)</b>
<b>OVERALL TOTAL</b>	<b>0</b>	<b>2,455</b>	

Cash Flow by Tag YTD - All Dates  
4/7/2006 through 1/16/2020

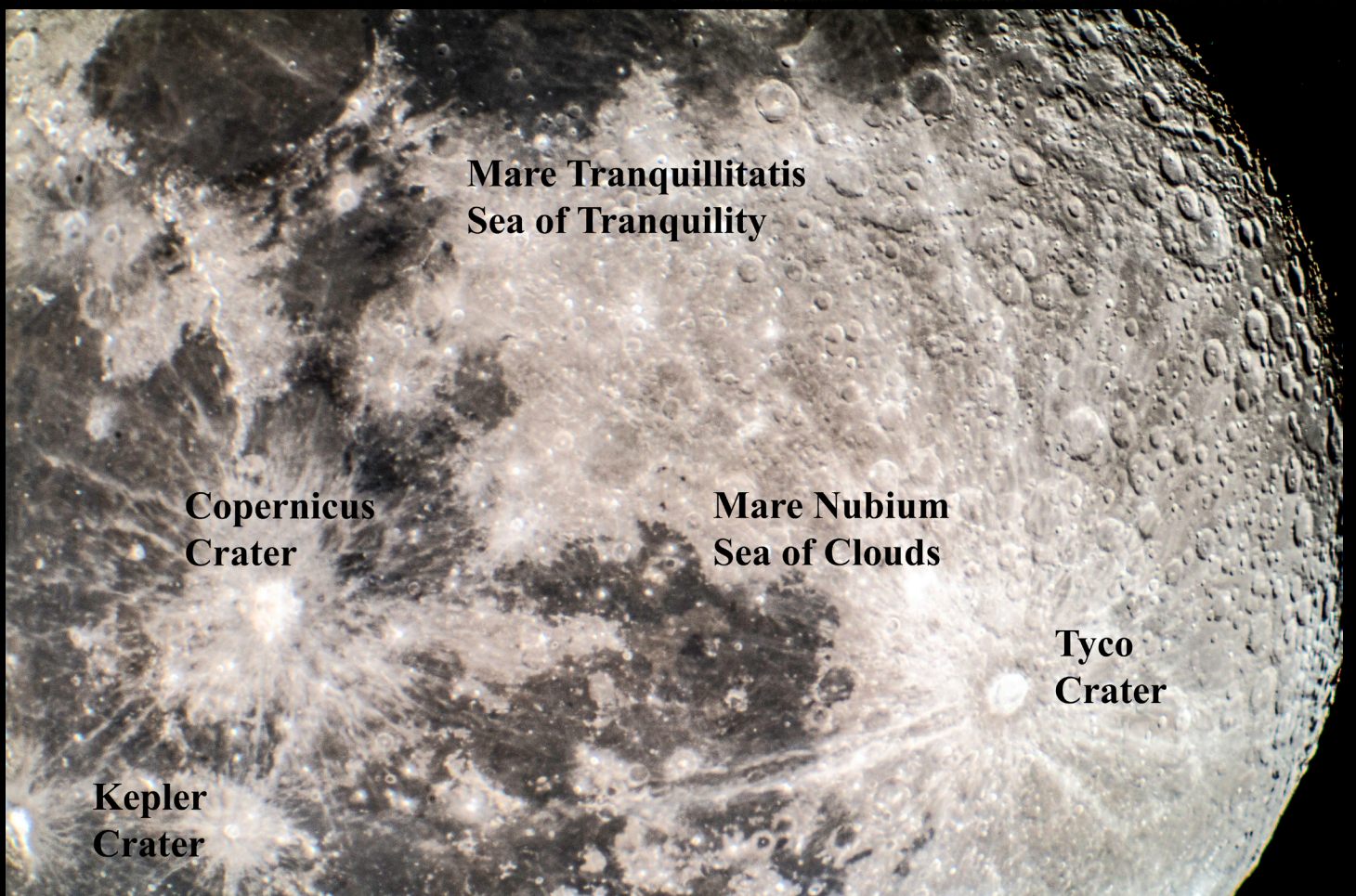
Category	2019	OVERALL TOTAL
<b>INFLOWS</b>		
Astro Assembly Income		
Banquet	1,355.00	1,355.00
Doantions	25.00	25.00
Grill	480.00	480.00
Misc	8.00	8.00
Raffle	511.00	511.00
Registration	1,555.00	1,555.00
<b>TOTAL Astro Assembly Income</b>	<b>3,934.00</b>	<b>3,934.00</b>
Astronomical League Membership Co... Donation	90.00	90.00
Donation for Capital Improvements	3,015.00	3,015.00
Misc Donation	2,754.92	2,754.92
Tracy Prell Birthday Fundraiser	1,569.78	1,569.78
<b>TOTAL Donation</b>	<b>7,339.70</b>	<b>7,339.70</b>
Dues		
Family	1,020.00	1,020.00
Junior	30.00	30.00
Regular	1,550.00	1,550.00
Senior	800.00	800.00
<b>TOTAL Dues</b>	<b>3,400.00</b>	<b>3,400.00</b>
Misc Income		
Sale of Items	140.00	140.00
<b>TOTAL Misc Income</b>	<b>140.00</b>	<b>140.00</b>
Star Party Donations	150.00	150.00
<b>TOTAL INFLOWS</b>	<b>15,053.70</b>	<b>15,053.70</b>
<b>OUTFLOWS</b>		
Astro Assem Exp		
Banquet		
Caterer	747.50	747.50
Reception	19.00	19.00
<b>TOTAL Banquet</b>	<b>766.50</b>	<b>766.50</b>
Grill	159.53	159.53
Hall Rental	200.00	200.00
Misc	53.20	53.20
Printing	50.00	50.00
Raffle	5.00	5.00
<b>TOTAL Astro Assem Exp</b>	<b>1,234.23</b>	<b>1,234.23</b>
Astronomical League Membership Ex... Corporation, State Fee	100.00	100.00
Domain Name	155.96	155.96
Misc Expenses	34.63	34.63
PayPal Fee	66.70	66.70
Postage and Delivery	11.00	11.00
Property Insurance	2,594.00	2,594.00
Refreshment Expense	77.05	77.05
Trustee Expense		
Property Maintenance	6,086.98	6,086.98
<b>TOTAL Trustee Expense</b>	<b>6,086.98</b>	<b>6,086.98</b>
Utilities		
Electric	372.58	372.58
Internet	719.91	719.91
Porta-John	880.00	880.00
Propane	243.37	243.37
<b>TOTAL Utilities</b>	<b>2,215.86</b>	<b>2,215.86</b>
<b>TOTAL OUTFLOWS</b>	<b>12,598.41</b>	<b>12,598.41</b>
<b>OVERALL TOTAL</b>	<b>2,455.29</b>	<b>2,455.29</b>



# Astrophoto Gallery



Waning gibbous Moon on January  
13 by Tracy Prell using Explore  
Scientific 102mm refractor.



**Mare Tranquillitatis**  
**Sea of Tranquility**

**Copernicus**  
**Crater**

**Mare Nubium**  
**Sea of Clouds**

**Tycho**  
**Crater**

**Kepler**  
**Crater**





# Quest for the Northern Lights

6 Nights • October 11 - 17, 2020

**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<sup>^</sup>

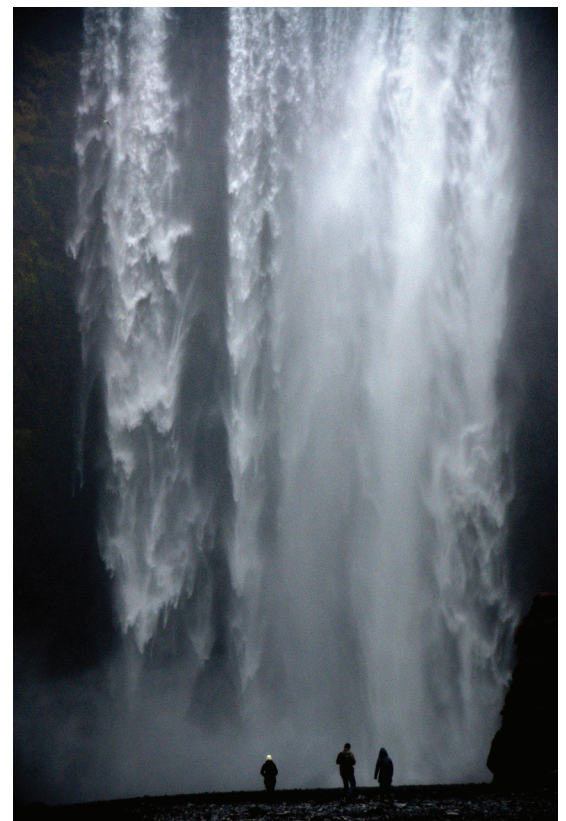
**From: \$3,329 pp**

**RESERVE YOUR SPOT TODAY!**

Melissa Mennella

401-868-2000 ext. 2662

MMennella@AAANortheast.com





# Itinerary:

B = Breakfast, L = Lunch, D = Dinner

**Day 1: October 11, 2020** - Overnight Flight to Reykjavik

**Day 2: October 12, 2020** - 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 13, 2020** - 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 14, 2020** - 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 15, 2020** - 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 16, 2020** - 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 17, 2020** - 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 11, 2020 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.





# AAA Northeast Reservation Form

Group Name: **Rhode Island Skyscrapers**

Tour Name: **Iceland's Northern Lights**

Travel Dates: **October 11- 17, 2020**

### FOR RESERVATIONS PLEASE CONTACT

Melissa Mennella, Group Sales and Product Operations (401) 868 -2000 x 2662 [mmennella@aaanortheast.com](mailto:mmennella@aaanortheast.com)  
AAA Northeast 110 Royal Little Drive Providence, RI 02904

### TRIP COST

**\$3329 per person double occupancy // \$3979 per person single occupancy**

Reservations booked and deposited by December 15, 2019 will receive a \$50 per person early booking discount.

### DEPOSIT AND FINAL PAYMENT

**Deposit: \$250 per person // Final payment: Due by June 13, 2020**

Please complete the form below and mail it, along with a copy of your passport to the address above. Names **MUST** be listed in full exactly as they appear on your passport. If the name on your reservation does not **EXACTLY** match the name on your passport, you will not be allowed to proceed through TSA. Name changes and/or modifications will result in a fee.

### YOUR INFORMATION

First / Middle/ Last Name \_\_\_\_\_

DOB \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Address \_\_\_\_\_

Phone \_\_\_\_\_ Email Address \_\_\_\_\_

Rooming with \_\_\_\_\_

Emergency contact name \_\_\_\_\_ Phone \_\_\_\_\_

### TRAVEL PROTECTION

- Yes, I would like to purchase travel protection (**\$226** per person based on double occupancy, **\$254** per person based on single occupancy)
- No, I decline travel protection

*\*Please note that if you choose not to purchase travel protection, you will incur penalties for changes and/or cancellations. To ensure preexisting conditions are covered, the travel protection is due with your initial deposit. Price of insurance varies based upon age, state of residence and package price. Please call for an insurance quote.*

### SPECIAL NOTES

Please use this area to note any special requests, dietary restrictions, food allergies, or medical restrictions:

\_\_\_\_\_  
\_\_\_\_\_

### NOTES

\*All US citizens traveling outside of the United States are required to carry a valid passport. Passports must be valid for at least six months from the date of your return to the US. For up to date international travel documentation, visit [www.travel.state.gov](http://www.travel.state.gov) well in advance of your travel.

### PAYMENT INFORMATION

Method of Payment Check  *Please make all checks payable to: AAA Northeast* Deposit Total \_\_\_\_\_

Credit Card  AMEX \_\_\_ VISA \_\_\_ DISCOVER \_\_\_ MASTERCARD \_\_\_

Credit Card # \_\_\_\_\_ Exp. Date \_\_\_\_ / \_\_\_\_ CVV \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_ / \_\_\_\_ / \_\_\_\_

*\*Cash deposits are not accepted*

# 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