



the Skyscraper

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November 2018

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

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Friday, November 2, 7:00pm at Seagrave Observatory

Stepping Through the Cosmos by Diana Hannikainen

One of the most striking concepts people learn at some point or another is that the light from various objects we see in the night sky has taken years, or thousands of years, or millions of years to reach us here on Earth. It's always an interesting exercise to compare the physical distance of a source with the temporal gulf that spans in historical terms. Diana Hannikainen, observing editor from Sky & Telescope magazine, would like to take you on a journey backward in time by visiting binocular or small scope targets along the way. At each stop, we shall identify the easiest way to locate these targets, and also explore the interesting physics of the different classes of object.

Diana Hannikainen graduated from the University of Edinburgh in Scotland with a BSc in Physics and Astronomy, and then decided to she needed to explore my Finnish roots ... she therefore attended the University of Helsinki where she obtained an MSc and then a PhD in high-energy astrophysics (the latter in conjunction with the University of Sydney in Australia). Diana's research focused on modeling the accretion-ejection connection in X-ray binaries, and so she spent most of her time observing these objects in the X-rays and radio. She has always been keen on science writing and all that it entailed, and she couldn't believe her good fortune when just a little more than a year ago Sky & Telescope hired her. It's been sheer joy reconnecting with the night sky from a visual perspective.

**Skyscrapers
Board Meeting**
Monday, November 19, 7pm
All Members Welcome

Phases of the Moon

- New Moon**
November 7 16:02
- First Quarter Moon**
November 15 14:54
- Full Beaver Moon**
November 23 05:39
- Last Quarter Moon**
November 30 00:19



Seagrave Memorial
Observatory
Open Nights

Saturdays st 7:00 pm
weather permitting.

President's Message

by Steve Hubbard

As I write this, our most recent Astroassembly is a couple of weeks in the rear view mirror. It was a great one!! The weather cooperated, we had a good crowd, great speakers and a fantastic evening dinner together. I can't single out just one person responsible, this is one of our real team efforts. There is a lot that goes into this, from lining up speakers to getting the grounds ready, to creating the programs and much, much more. To everyone who helped out, THANK YOU!

Looking to the future, we have a strong line up of speakers for our upcoming meetings and our special December Holiday meeting to look forward to also. Don't forget...we start meeting at the Scituate Community Center in December and are there until March, possibly April depending upon the weather.

Finally, member Terry Turner has been spearheading an effort to have members bring non perishable food items to each meeting to be passed on to the local food pantry on behalf of Skyscrapers. If you can, please try and bring something along for this worthy effort. See you at our next meeting!

Upcoming Meetings

Friday, November 2: Seagrave Observatory
Diana Hannikainen: "Stepping Through the Cosmos"

Saturday, December 15: North Scituate Community House
Member Presentations, Holiday Party

Friday, January 4: North Scituate Community House
TBA

Friday, February 1: North Scituate Community House
TBA

Friday, March 1: North Scituate Community House
TBA

Friday, April 5: North Scituate Community House
TBA

Skyscrapers Food Basket

Skyscrapers has now started a food donation program! Just simply bring a caned good or two each time you visit the meeting hall or observatory; place it in the Food Donation box in the hall and they will be donated to our local food bank on a monthly basis.

amazon smile
You shop. Amazon gives.

<https://smile.amazon.com/ch/05-0382371>

Skyscrapers Library Borrowing Procedure

The catalog of available items to borrow is available at <http://www.theskyscrapers.org/library-procedures>, as well as in the meeting hall in proximity to the bookcases.

To borrow an item a member can: 1) review the list online before coming to a meeting 2) review a hard copy of the list on a meeting night.

Once a member chooses an item they can ask **Dave Huestis** or **Weston Ambrose** to retrieve it from the bookcase. The member will then sign the item out. This check out procedure will occur only between 7:00pm and 7:30pm on monthly meeting nights held at Seagrave.

Borrowed items should be returned at the next meeting unless other arrangements are made.



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 **November 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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What's Up ... in the Sky for November?

by Dave Huestis

The first event we need to concern ourselves with is setting our clocks back one hour to Eastern Standard Time (EST) at 2:00 a.m. on Sunday, November 4. Remember the phrase “spring ahead and fall back/behind?” While this is not an astronomical occurrence, it can affect the time when you might wish to observe a particular phenomenon. My columns always reflect EST unless otherwise noted. I don't wish you to miss a time-critical sky event. Plus, I know we can all find a use for that extra hour—ZZZZZZ.

Say goodbye to Jupiter for a while as he moves closer to the Sun in our sky in the first few days of the month. Just after sunset, if you have a dead horizon (down by the beaches), you'll see him set in the south-southwest sky. You may even catch a glimpse of Mercury, the closest planet to the Sun. Mercury will be about five degrees to the lower left of Jupiter. First find Jupiter and then use binoculars to locate Mercury. A camera with a telephoto lens will definitely reveal the pair. Try various exposures.

Saturn is also nearing the end of its evening apparition. This beautiful ringed planet can still be found above the teapot asterism of Sagittarius. If you haven't been able to locate Saturn in the sky, after sunset on November 11 take a look towards the southwest. Use the waxing crescent Moon as your guide. Saturn will be just less than three degrees (six full moon diameters) to the lower right of the Moon.

Once again, unless you have access to an

unobstructed view of the south-southwest horizon, tree-lines will prevent observing Saturn much beyond mid-November. So if the weather permits make an effort to view this “lord of the rings” as soon as possible.

Thankfully Mars will be visible throughout November. The cloudy and rainy weather of September and early October prevented local stargazers from observing this neighboring world. The Earth has been quickly moving away from Mars since its close approach back on July 31 when our two worlds were 35.8 million miles apart. By November 1 that distance will have increased to 73,392,000 miles. Some Mars' surface detail should still be discernible through a telescope.

At midnight on the night of November 4-5 the Earth will pass through a stream of debris left in orbit by Comet Encke. The Taurids are fairly slow meteors that enter our atmosphere at approximately 17 miles per second. These often very bright yellow fireballs (meteors that explode and fragment into multiple pieces) comprise the Taurid meteor shower. You can expect no more than a half dozen shooting stars to emanate from the constellation Taurus. To locate Taurus find the V-shaped pattern that defines the bull's face, or locate the Pleiades — the Seven Sisters. Luckily, a waning crescent moon rises around 3:50 a.m. locally and will not interfere with observing as many meteors as possible.

For the last few years our fickle New England weather has conspired to prevent

us from enjoying many decent displays of shooting stars from the well-known major and minor meteor showers. We've got a couple more before the end of 2018, so let's hope this intolerable pattern begins to change. On the night of November 17-18, the peak of the annual Leonid meteor shower occurs. A waxing gibbous Moon sets at 1:24 a.m. locally, so between then and dawn's early light an observer in a dark-sky location can expect to see perhaps 15 meteors per hour.

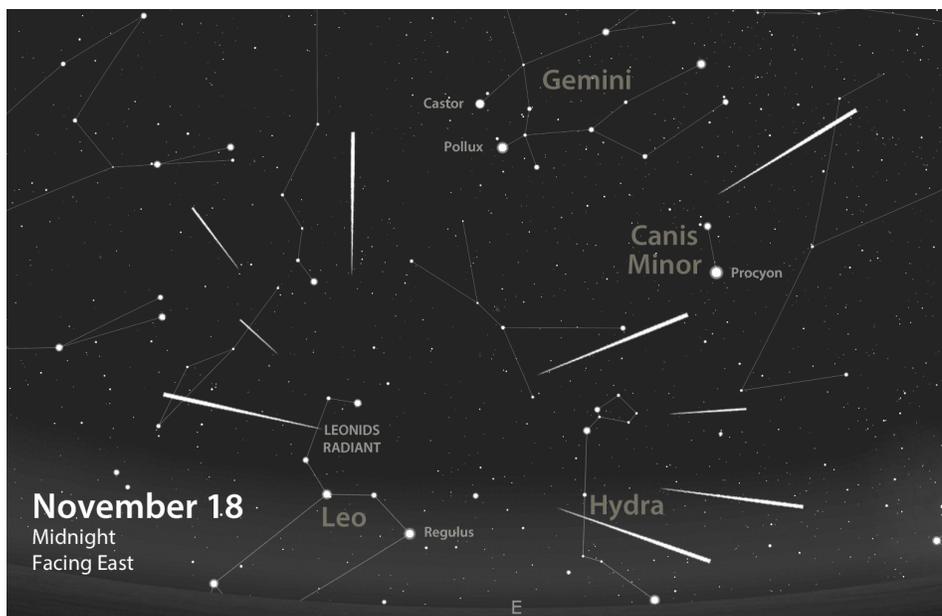
These blue or green Leonids can blaze across the sky at around 44 miles per second as they hit the Earth's atmosphere nearly head-on. The resulting display may produce many fireballs, with about half of them leaving trains of dust that can persist for minutes. The area of sky from where the meteors appear to radiate is in the Sickle (backwards question mark) asterism in Leo.

And finally, the Full Beaver Moon occurs on the 23rd, the day after Thanksgiving, at 12:39 a.m. EST. Native Americans gave it this name because they harvested beaver pelts at this time of year for warmth during the long and cold winters. I'm hoping my down coat will not see frequent use this winter season!

Seagrave Memorial Observatory (<http://www.theskyscrapers.org>) in North Scituate is open to the public 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 Thursday night. Frosty Drew Observatory (<http://frosty-drew.org/>) in Charlestown is open every clear Friday night year-round.

Always keep looking up towards the night sky to behold the majesty of the heavens.

Clear skies for all your observing adventures.



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>



Atmospheric Optics: Sun Dogs & Moon Dogs

by Francine Jackson

As you're walking or driving around the region – especially if you happen to be in one of our incessant traffic jams - out of the corner of your eye have you suddenly seen what looks like a mini-rainbow, but it wasn't coming out from the ground, as you normally see them, but just off to the side of the Sun? And, there might be a chance that there's another one on the direct opposite side of the Sun, and possibly above it as well. What you're seeing is a sun dog.

They are commonly caused by refraction and scattering of light from hexagonal ice crystals suspended in high and cold cirrus clouds, or possibly drifting in very cold moist air at low levels. The crystals act as prisms, bending the light passing through them and deflecting them 22 degrees. As these crystals float downward, the sunlight

is refracted horizontally and we see them to both the left and right of the Sun. You might notice, when you see them that they are always colored with the red closest to the Sun, followed by other colors of the rainbow; they are never perfectly striking, but seem to almost meld together. Also, don't be surprised if you also see one of these phenomena above the Sun, also at its 22 degree position, but most people looking at the sideways light often don't crane their necks up, above the Sun.

More rare are the Moon dogs, caused roughly the same way, but the Moon does have to be at least a quarter phase, and, of course, it has to be quite cold outside. Also, as they aren't as bright as Sun dogs, our eyes can't pick up any color to them.

I'm mentioning them because it just

happens one day this past month, I was able to see both of these: The Sun dog while stuck in traffic on 95 in the afternoon, and the Moon dog that night in a field in West Greenwich, under conditions that were far from perfect, but it was worth being able to see this quite rare vision. Seeing both of these was a perfect reminder to always keep looking up, except when the traffic finally moves, of course.



Francine Jackson is Skyscrapers Public Relations Spokesperson, writes the weekly newsletter for Ladd Observatory and serves as planetarian at the University of Rhode Island. See more at <http://theskyscrapers.org/francine-jackson>

November's Dance of the Planets

By Jane Houston Jones and David Prosper

November's crisp autumn skies bring great views of our planetary neighbors. The Moon pairs up with Saturn and Mars in the evenings, and mornings feature eye-catching arrangements with dazzling Venus. Stargazers wanting a challenge can observe a notable opposition by asteroid 3 Juno on the 17th and watch for a few bright Leonid meteors.

Red Mars gleams high in the southern sky after sunset. Saturn sits westward in the constellation Sagittarius. A young crescent Moon passes near Saturn on the 10th and 11th. On the 15th a first quarter Moon skims by Mars, coming within 1 degree of the planet. The red planet receives a new visitor on November 26th, when NASA's InSight mission lands and begins its investigation of the planet's interior. News briefings and commentary will be streamed live at: bit.ly/landsafe

Two bright planets hang low over the western horizon after sunset as November begins: Jupiter and Mercury. They may be hard to see, but binoculars and an unobstructed western horizon will help determined observers spot them right after sunset. Both disappear into the Sun's glare by mid-month.

Early risers are treated to brilliant Venus sparkling in the eastern sky before dawn, easily outshining everything except the Sun and Moon. On November 6th, find a location with clear view of the eastern horizon to spot Venus next to a thin crescent Moon,

making a triangle with the bright star Spica. The following mornings watch Venus move up towards Spica, coming within two degrees of the star by the second full week of November. Venus will be up three hours before sunrise by month's end – a huge change in just weeks! Telescopic observers are treated to a large, 61" wide, yet razor-thin crescent at November's beginning, shrinking to 41" across by the end of the month as its crescent waxes.

Observers looking for a challenge can hunt asteroid 3 Juno, so named because it was the third asteroid discovered. Juno travels through the constellation Eridanus and rises in the east after sunset. On November 17th, Juno is at opposition and shines at magnitude 7.4, its brightest showing since 1983! Look for Juno near the 4.7 magnitude double star 32 Eridani in the nights leading up to opposition. It is bright enough to spot through binoculars, but still appears as a star-like point of light. If you aren't sure if you have identified Juno, try sketching or photographing its star field, then return to the same area over the next several days to spot its movement.

The Leonids are expected to peak on the night of the 17th through the morning of the 18th. This meteor shower has brought "meteor storms" as recently as 2002, but a storm is not expected this year. All but the brightest meteors will be drowned out by a waxing gibbous Moon.

Stay warm and enjoy this month's dance

of the planets!

You can catch up on all of NASA's current and future missions at nasa.gov

With articles, activities and games NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, stargazing info and more.



FOR SALE Dobsonian Telescope

10" f/6 Pyrex mirror, ground and polished by Cave Optical. Mirror needs to be realuminized.

JMI 2" Crayford focuser 1.25" adapter included

Telrad star spotter included

Laser collimator included

Price \$375

If interested, Please email Conrad at cardanoc@verizon.net



This finder chart shows the path of the asteroid 3 Juno as it glides past 32 Eridani in November 2018. The asteroid's position is highlighted for selected dates, including its opposition on the 17th. Image created in Stellarium for NASA Night Sky Network.

Dwarf Galaxy in Cassiopeia

NGC 147

by Glenn Chaple for LVAS

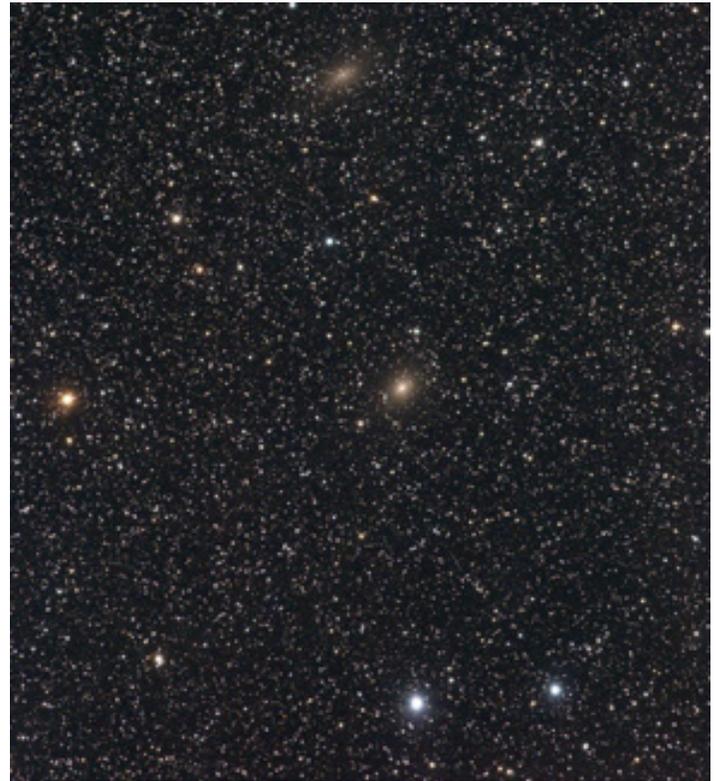
(Magnitude: 9.5 Size: 13' X 8')

This month's Observer's Challenge, the dwarf elliptical galaxy NGC 147 in Cassiopeia, has been glimpsed with 7X35 binoculars yet can be a challenge for a 10-inch scope. Its 9.5 visual magnitude sounds promising, but the light is spread over an area 13 by 8 arc-minutes in size. The situation is similar to that of Barnard's Galaxy (NGC 6822), briefly mentioned last September and featured as the August, 2014, Observer's Challenge.

Save NGC 147 for the clearest, darkest night possible and be sure your eyes are adequately dark-adapted. Begin by training your scope on 4th magnitude omicron (o) Cassiopeiae, located in the extreme southern part of the Queen and just 7° above the Andromeda Galaxy. Once you've centered omicron in the eyepiece field, work your way slowly westward. Just a degree from omicron, you should spot a slightly oval smudge of light. Don't put a notch in your telescope tube yet! This is NGC 185, also a dwarf galaxy and similar in brightness and size to NCG 147. However, it's more concentrated and has a higher surface brightness. NGC 147 is far less accommodating! Continue onward another degree and, if you're lucky, you should spot an extremely faint and elongated glow. This is NGC 147! Now you can make your notch (or preferably make an entry in your observing logbook).

If you fail to see NGC 147, don't give up. Conditions might prove more favorable on the next clear night. You can take solace in knowing that William Herschel surveyed this area in 1787. He spotted NGC 185 but failed to see NGC 147. His son, John, found the latter 42 years later.

NGC 147 and NGC 185 are satellites of the Andromeda Galaxy and, as such, are part of the Local Group. They are located 2.0 and 2.3 million light years away, respectively.



NGC 147 (top) and NGC 185 (lower) omicron Cassiopeiae is at bottom, center. North is to the left (www.astosurf.com)

The purpose of the LVAS Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone that is interested, and if you are able to contribute notes, drawings, or photographs, the LVAS will be happy to include them in our monthly summary. If you would like to contribute material, submit your observing notes, sketches, and/or images to either Roger Ivester (rogerivester@me.com) or Fred Rayworth (queex@embarqmail.com). To find out more about the LVAS Observer's Challenge or access past reports, log on to



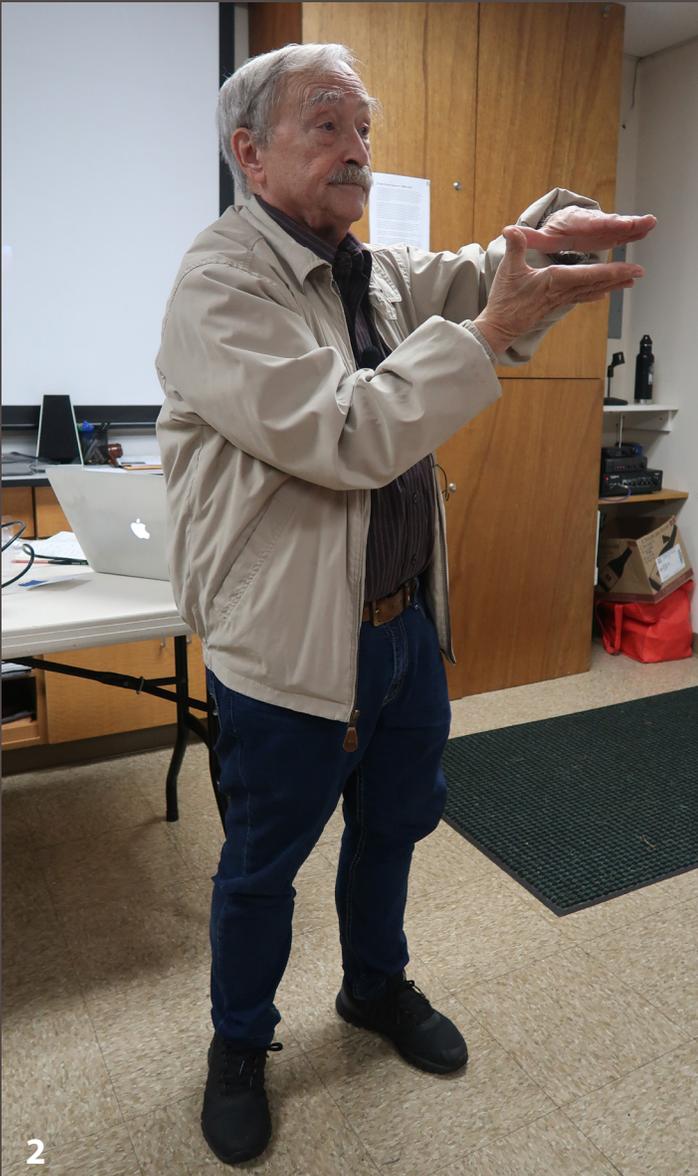
The Sun, Moon & Planets in November

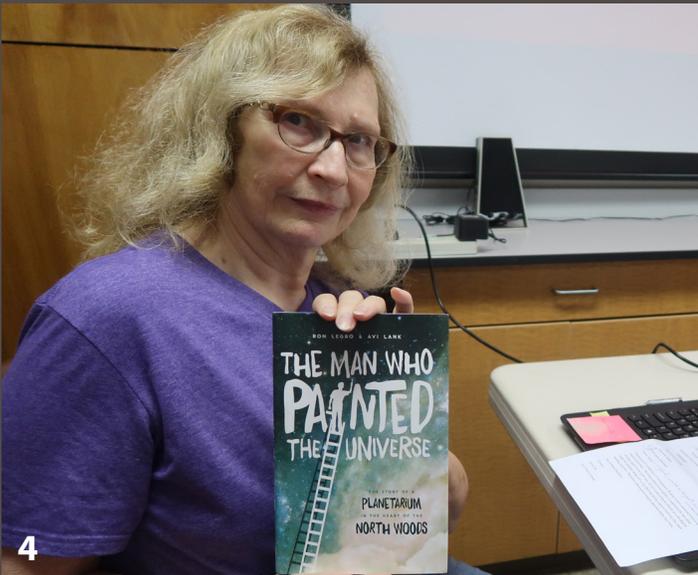
This table contains the ephemeris of the objects in the Solar System for each Saturday night in November 2018. Times in Eastern Standard Time (UTC-5), except for November 2 (UTC-4). Ephemeris times are for Seagrave Observatory (41.845N, 71.590W).

| Object | Date | RA | Dec | Const | Mag | Size | Elong | Phase(%) | Dist(S) | Dist(E) | Rise | Transit | Set |
|----------------|-----------|---------|----------|-------|-------|--------|--------|----------|---------|---------|-------|---------|-------|
| Sun | 3 | 14 32.4 | -14 58.4 | Lib | -26.8 | 1934.4 | - | - | - | 0.99 | 07:20 | 12:29 | 17:38 |
| | 10 | 15 00.3 | -17 03.7 | Lib | -26.8 | 1937.8 | - | - | - | 0.99 | 06:29 | 11:30 | 16:30 |
| | 17 | 15 28.9 | -18 54.7 | Lib | -26.8 | 1941.0 | - | - | - | 0.99 | 06:37 | 11:31 | 16:24 |
| | 24 | 15 58.1 | -20 29.3 | Sco | -26.8 | 1943.8 | - | - | - | 0.99 | 06:46 | 11:33 | 16:19 |
| Moon | 3 | 10 53.0 | 9 48.0 | Leo | -11.2 | 1913.4 | 60° W | 25 | - | - | 02:31 | 09:18 | 15:56 |
| | 10 | 16 55.7 | -19 46.5 | Oph | -9.5 | 1823.3 | 28° E | 6 | - | - | 09:15 | 14:07 | 18:57 |
| | 17 | 22 49.7 | -11 45.3 | Aqr | -12.1 | 1808.1 | 105° E | 63 | - | - | 13:54 | 19:35 | 01:24 |
| | 24 | 4 45.9 | 17 56.1 | Tau | -12.7 | 1950.2 | 169° W | 99 | - | - | 17:53 | 01:29 | 09:09 |
| Mercury | 3 | 16 03.1 | -23 28.5 | Sco | -0.1 | 6.2 | 23° E | 70 | 0.42 | 1.09 | 09:29 | 14:01 | 18:32 |
| | 10 | 16 33.2 | -24 42.8 | Oph | 0.0 | 7.1 | 23° E | 55 | 0.39 | 0.95 | 08:36 | 13:02 | 17:28 |
| | 17 | 16 47.3 | -24 27.5 | Oph | 0.7 | 8.4 | 19° E | 31 | 0.35 | 0.80 | 08:19 | 12:46 | 17:14 |
| | 24 | 16 31.0 | -22 06.0 | Oph | 4.1 | 9.7 | 8° E | 5 | 0.32 | 0.69 | 07:21 | 11:59 | 16:37 |
| Venus | 3 | 13 40.3 | -15 25.2 | Vir | -3.8 | 60.8 | 13° W | 2 | 0.72 | 0.28 | 06:28 | 11:34 | 16:40 |
| | 10 | 13 32.4 | -12 47.2 | Vir | -4.2 | 56.8 | 22° W | 7 | 0.72 | 0.30 | 04:43 | 09:59 | 15:15 |
| | 17 | 13 31.8 | -10 54.5 | Vir | -4.3 | 51.6 | 29° W | 13 | 0.72 | 0.33 | 04:09 | 09:32 | 14:55 |
| | 24 | 13 38.0 | -9 57.9 | Vir | -4.4 | 46.2 | 35° W | 19 | 0.72 | 0.37 | 03:44 | 09:11 | 14:37 |
| Mars | 3 | 21 41.7 | -16 10.1 | Cap | -0.6 | 11.7 | 102° E | 86 | 1.40 | 0.80 | 14:34 | 19:37 | 00:41 |
| | 10 | 21 57.3 | -14 31.0 | Cap | -0.4 | 11.0 | 99° E | 86 | 1.40 | 0.85 | 13:15 | 18:25 | 23:35 |
| | 17 | 22 13.2 | -12 46.7 | Aqr | -0.3 | 10.4 | 96° E | 86 | 1.41 | 0.90 | 12:57 | 18:14 | 23:31 |
| | 24 | 22 29.5 | -10 57.8 | Aqr | -0.1 | 9.8 | 93° E | 86 | 1.41 | 0.96 | 12:39 | 18:02 | 23:26 |
| 1 Ceres | 3 | 13 46.8 | -3 48.5 | Vir | 8.7 | 0.3 | 16° W | 100 | 2.62 | 3.56 | 05:54 | 11:42 | 17:31 |
| | 10 | 13 58.3 | -4 57.4 | Vir | 8.7 | 0.4 | 19° W | 100 | 2.62 | 3.53 | 04:42 | 10:26 | 16:10 |
| | 17 | 14 09.8 | -6 03.6 | Vir | 8.8 | 0.4 | 23° W | 99 | 2.63 | 3.51 | 04:30 | 10:10 | 15:50 |
| | 24 | 14 21.2 | -7 06.9 | Vir | 8.8 | 0.4 | 27° W | 99 | 2.63 | 3.47 | 04:17 | 09:54 | 15:30 |
| Jupiter | 3 | 15 46.9 | -19 12.8 | Lib | -1.6 | 31.2 | 18° E | 100 | 5.37 | 6.30 | 08:52 | 13:42 | 18:32 |
| | 10 | 15 53.2 | -19 33.0 | Lib | -1.6 | 31.1 | 13° E | 100 | 5.36 | 6.33 | 07:32 | 12:20 | 17:09 |
| | 17 | 15 59.7 | -19 52.6 | Lib | -1.6 | 31.0 | 7° E | 100 | 5.36 | 6.34 | 07:12 | 11:59 | 16:46 |
| | 24 | 16 06.2 | -20 11.3 | Sco | -1.6 | 31.0 | 2° E | 100 | 5.36 | 6.35 | 06:53 | 11:38 | 16:24 |
| Saturn | 3 | 18 22.1 | -22 45.8 | Sgr | 0.6 | 15.6 | 55° E | 100 | 10.06 | 10.60 | 11:42 | 16:16 | 20:51 |
| | 10 | 18 24.8 | -22 45.1 | Sgr | 0.6 | 15.5 | 48° E | 100 | 10.06 | 10.70 | 10:17 | 14:51 | 19:26 |
| | 17 | 18 27.7 | -22 44.1 | Sgr | 0.6 | 15.4 | 42° E | 100 | 10.06 | 10.78 | 09:52 | 14:27 | 19:01 |
| | 24 | 18 30.7 | -22 42.6 | Sgr | 0.6 | 15.3 | 35° E | 100 | 10.06 | 10.85 | 09:27 | 14:02 | 18:37 |
| Uranus | 3 | 1 53.0 | 11 00.0 | Ari | 5.7 | 3.7 | 170° E | 100 | 19.87 | 18.89 | 17:03 | 23:45 | 05:27 |
| | 10 | 1 52.0 | 10 54.3 | Ari | 5.7 | 3.7 | 162° E | 100 | 19.87 | 18.92 | 15:35 | 22:17 | 04:58 |
| | 17 | 1 51.0 | 10 48.9 | Ari | 5.7 | 3.7 | 155° E | 100 | 19.87 | 18.97 | 15:07 | 21:48 | 04:30 |
| | 24 | 1 50.0 | 10 44.0 | Ari | 5.7 | 3.7 | 148° E | 100 | 19.87 | 19.02 | 14:39 | 21:20 | 04:01 |
| Neptune | 3 | 23 01.9 | -7 16.5 | Aqr | 7.8 | 2.3 | 123° E | 100 | 29.94 | 29.38 | 15:19 | 20:55 | 01:31 |
| | 10 | 23 01.7 | -7 18.1 | Aqr | 7.9 | 2.3 | 116° E | 100 | 29.94 | 29.49 | 13:51 | 19:27 | 01:03 |
| | 17 | 23 01.5 | -7 19.0 | Aqr | 7.9 | 2.3 | 109° E | 100 | 29.94 | 29.60 | 13:24 | 18:55 | 00:35 |
| | 24 | 23 01.4 | -7 19.2 | Aqr | 7.9 | 2.3 | 102° E | 100 | 29.94 | 29.72 | 12:56 | 18:32 | 00:08 |
| Pluto | 3 | 19 22.4 | -22 06.0 | Sgr | 14.3 | 0.2 | 69° E | 100 | 33.67 | 34.02 | 12:39 | 17:16 | 21:53 |
| | 10 | 19 22.9 | -22 05.6 | Sgr | 14.3 | 0.2 | 62° E | 100 | 33.68 | 34.14 | 11:12 | 15:49 | 20:26 |
| | 17 | 19 23.5 | -22 05.0 | Sgr | 14.4 | 0.2 | 55° E | 100 | 33.68 | 34.24 | 10:45 | 15:22 | 20:00 |
| | 24 | 19 24.3 | -22 04.2 | Sgr | 14.4 | 0.2 | 48° E | 100 | 33.69 | 34.34 | 10:18 | 14:55 | 19:33 |



1. Members and guests gather for Peter Schultz presentation.
2. Peter Schultz answers questions about lunar cratering.
3. Peter Schultz looks through Gerry Dyck's homemade spectroscope.





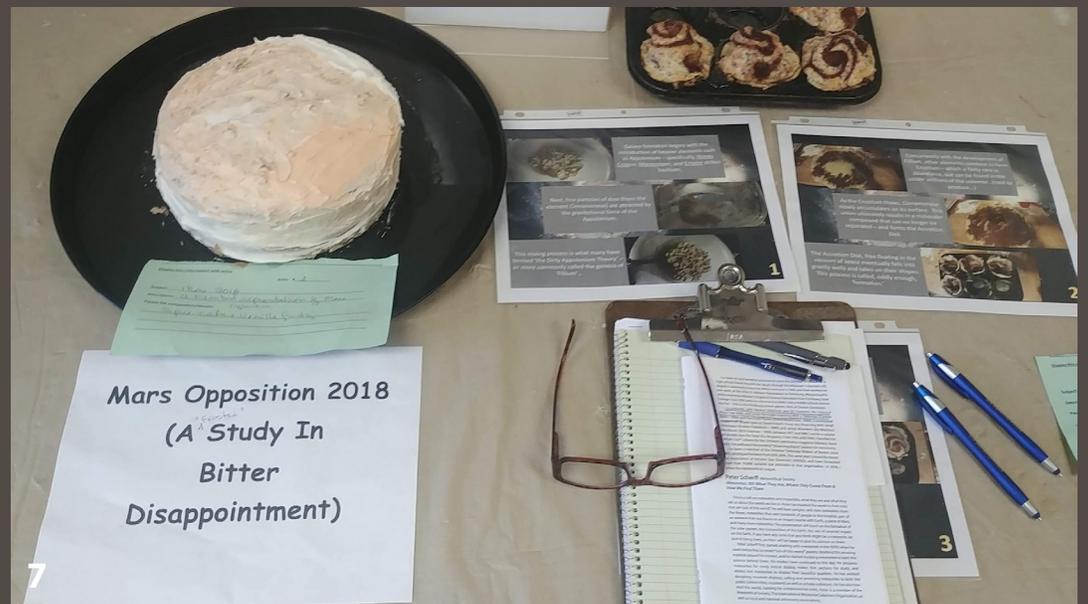
4



5



6



7



8

4. Francine Jackson presents The Man Who Painted the Universe, about Frank Kovac and his homemade planetarium.
5. Savvas Koushiappas presents about a trip to Tahiti.
6. AstroAssembly emcee Scott Tracy.
7. Astro Bake-off.
8. Skyscrapers grill chefs Jim Crawford and Matt Ouelette.



9. Tina Huestis and Linda Bergemann at the registration table. 10 & 11 Buffet dinner.



10



11



12

12. Members and guests gather for the evening presentations.
13. Raffle prizes.
14. Kathy Siok gives out raffle prizes.
15. Jonathan McDowell gives the evening presentation.



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AstroAssembly photo credits: Tracy Prell (9, 10, 13, 14, 15, 16), Jim Hendrickson(1, 2, 3, 4, 5, 6, 12), Steve Hubbard (7, 8, 11).

Proposed Changes to Constitution & Bylaws

Constitution

ARTICLE IV: MEMBERSHIP

§2. An applicant for Junior, Regular, Family, and Senior shall submit the standard form of Membership application together with noted dues, shall be proposed by an existing member at a regular meeting, and shall become a member upon receiving a favorable majority vote at a subsequent regular meeting of the Society.

§8. Membership Dues in this Society are as listed within the Membership Application.

Bylaws

ARTICLE I: FISCAL YEAR & DUES

§2. Dues are payable on April 1 for the dues year then beginning. The annual dues shall be set out in the Membership Application (revised annually). Persons applying for membership during the months of April through December pay the above stated annual dues for the current fiscal year (April – March). Persons applying for membership during the months of January through March pay the above stated annual dues, but their membership extends through the next fiscal year. Persons making donations over and above their membership dues shall be called Contributing Members. Four distinguished categories of Contributing Members shall be designated: Sponsors (\$60); Supporters (\$100); Patrons (\$250); and Benefactors (\$500).

ARTICLE II: OFFICERS

§7. The Secretary shall:

1. Take the minutes of all meetings, regular, special, Annual and Board of Directors, and submit a written report to be published in the Skyscraper newsletter.
2. Maintain an accurate, classified list of the membership of the Society. Membership Applications shall be submitted to the Secretary who shall transmit the attached dues to the Treasurer.
3. Notify applicants for membership of their election or rejection.
4. If required by the President, notify all additional officers, chairmen and committees of their appointment.
5. Send all required notices to the membership.
6. In general, conduct the correspondence of the Society.
7. Have custody of the records of the Society.

Constitution

ARTICLE IV: MEMBERSHIP

§2. An applicant for Junior, Regular, Family, and Senior shall submit a Membership application together with appropriate dues to the Secretary of the Society. Application for membership and payment of dues may also be done on the Society's website.

§8. Membership Dues in this Society are as listed within the Membership Application and on the Society's website.

Bylaws

ARTICLE I: FISCAL YEAR & DUES

§2. Dues are payable on April 1 for the dues year then beginning. The annual dues shall be as stated in the Membership Application and on the Society's website. Persons applying for membership during the months of April through December pay the above stated annual dues for the current fiscal year (April – March). Persons applying for membership during the months of January through March pay the above stated annual dues, but their membership extends through the next fiscal year. Persons making donations over and above their membership dues shall be called Contributing Members. Four distinguished categories of Contributing Members shall be designated: Sponsors (\$60); Supporters (\$100); Patrons (\$250); and Benefactors (\$500).

ARTICLE II: OFFICERS

§7. The Secretary shall:

1. Take the minutes of all meetings, regular, special, Annual and Board of Directors, and submit a written report to be published in the Skyscraper newsletter.
2. Maintain an accurate, classified list of the membership of the Society. Membership Applications and renewals shall be submitted to the Secretary who shall transmit the attached dues to the Treasurer.
3. Notify applicants for membership of receipt of their application and welcome them into the Society. Introduce new members to the general membership at the next regular meeting they attend.
4. If required by the President, notify all additional officers, chairmen and committees of their appointment.
5. Send all required notices to the membership.
6. In general, conduct the correspondence of the Society.
7. Have custody of the records of the Society.

ORIGINAL

PROPOSED CHANGES - 06/12/18

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