



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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**Skyscrapers
Board Meetings**
Third Monday of the Month
All Members Welcome

Phases of the Moon

First Quarter Moon
November 7 19:51

Full Beaver Moon
November 14 13:52

Last Quarter Moon
November 21 08:33

New Moon
November 29 12:18

Saturday, November 12, 7:00pm at Seagrave Memorial Observatory

7:00 pm Light Refreshments
7:30 pm Tim Barker, Professor of Astronomy Emeritus, Wheaton College presents "Samples from the Moon"

Tim Barker will show six samples in a Plexiglas disk of material returned from the Moon by the Apollo program nearly half a century ago. Twelve astronauts, supported by 400,000 other Americans who worked on the program, walked on the Moon, engaged in scientific experiments, and brought back lunar samples and their own compelling personal stories. Their work led to a revolution in our understanding of the

history of the solar system and our place in it.

Tim Barker received a Ph.D. in Astrophysics from the University of California at Santa Cruz in 1974 and has been a professor at Wheaton College ever since. He has taught courses in subjects such as extraterrestrial life, the solar system, the universe, observational astronomy, and ancient astronomies. His research interests include minor planets, the deaths of stars, and transient lunar phenomena.



**Center for Astrophysics Lecture Webcasts
at Seagrave Observatory
November 17**

**Skyscrapers Workshop Series
Saturdays, 6pm
November 5, 19 & December 3**



**Seagrave Memorial Observatory
Open Nights**

Saturdays at 7:00 pm
weather permitting

President's Message

by Steve Siok

Ever since the days of H. G. Wells and Edgar Rice Burroughs' novels, "John Carter of Mars", we have been fascinated by the possibility of people (or smart aliens) living on Mars. And ever since the days of Chesley Bonestell and Willy Lee, we have imag-

ined human space travel to the Moon and Mars. This month Skyscrapers members can participate in two events echoing these sentiments.

On Saturday, November 12, at our monthly meeting held at Seagrave Obser-

vatory, Dr. Tim Barker, will display and discuss Moon rocks returned to earth by Apollo astronauts and on short term loan from NASA. You will have the opportunity to examine these samples, so don't miss this evening! Normal start time is 7:00pm.

On Monday, November 14, the National Geographic channel on cable will begin a six part TV series called "The Race to the Red Planet". The show airs at 9:00pm. So stay home on Monday nights or "set your VCR" so you do not miss any of the shows. In support of this effort, the November issue of National Geographic magazine has a feature article about attempts to get to Mars and has a nice poster showing the surface of the red planet, as well as a graphic of a human colony.

Thursday, November 17th is the monthly open night at the Harvard-Smithsonian Center for Astrophysics in Cambridge, MA. We will be streaming this event live at Seagrave. The topic is "The Care and Feeding of Monster Black Holes" by Paul Greene of CfA. So come to Seagrave and bring some peanuts and Cracker Jacks. Plan to arrive around 7, as the event starts at 7:30.

Keep Looking up! -Steve



Steve Siok is president of Skyscrapers, Inc. See more at <http://www.theskyscrapers.org/steve-siok>



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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Upcoming Meetings

Saturday, November 12 at Seagrave Observatory

Tim Barker

Saturday, December 10 at North Scituate Community Center

Holiday Meeting, Al Hall & Dick Parker

Saturday, January 7 at North Scituate Community Center

Conrad Cardano

Saturday, February 4 at North Scituate Community Center

Stephon Alexander

Saturday, March 4 at North Scituate Community Center

still open

Let's Go "Back to the Moon for Good" at the URI Planetarium

URI Campus, Upper College Road
Kingston, RI 02881

Friday, November 11th, 2016, 6:00 P.M.

It's been over 45 years since humans have walked on the Moon. But, are there plans to go back? Should we? Could we? How could this happen? Please join the URI Planetarium as it plays this award-winning show about the possibility of returning to our one and only natural satellite. "Back to the Moon for Good" will be shown Friday, November 11th, at 6:00 P.M. In addition, a

short program on Light Pollution will be shown, then The Skies of the URI campus, a live introduction to the night sky.

Admission is only \$5.00, to benefit the University of Rhode Island Planetarium Fund.

The University of Rhode Island Planetarium is located on Upper College Road, on the Kingston campus, across from the Art Center.

The University of Rhode Island Planetarium is available for programming for schools and other organizations. For more information, please contact Francine Jackson at 401-527-5558.



Center for Astrophysics Lecture Nights at Seagrave Observatory

The Harvard-Smithsonian Center for Astrophysics has a talk geared to the public every third Thursday evening. These talks have gotten so popular that the CfA is now starting to distribute tickets to them,

resulting in fewer seats available. However, these programs are streamed, so Skyscrapers, Inc., will be scheduling "movie night" at Seagrave, where we can enjoy the talk in the comfort of the clubhouse.

The next program on **November 17**, will feature Paul J. Green, with "The Care and Feeding of Monster Black Holes," be-

ginning precisely at 7:30 P.M., when emcee Christine Pulliam starts her introduction of the evening's speaker. The talks normally last about an hour, and, as is done there, if skies are clear, we can do our own observing. Bring food, and get set for an interesting talk.

Introduction to Amateur Astronomy Workshop Series

Anyone interested in learning the fascinating hobby of amateur astronomy is invited to come to Seagrave Memorial Observatory, 47 Peep Toad Road, Scituate, RI. Skyscrapers, Inc., the Amateur Astronomical Society of Rhode Island, is offering workshops at 6pm on Saturdays in October & November on topics in astronomy to introduce anyone interested in the fascinating world of amateur astronomy. Also, sky permitting, each program will be followed by observing with the historic 8-inch refracting telescope. All programs are free and open to the public.

November 5: Backyard Observatories

Did you ever get frustrated with the time and effort to set up a telescope for observing? Skyscraper member Steve Hubbard did, and found that a backyard home observatory was the perfect cure. Ever wondered

about having an observatory or your own? Steve will take the mystery away with some practical tips and solutions to help you decide if having a simple, easy to build backyard home for your telescope is for you.

November 19: Using a Telescope

You've always wanted a telescope of your own; or, you've gotten one as a gift. Now what? What can I see with it? How do I work with it? Where can I go to learn all about using a telescope to find what is in the sky?

Skyscraper member Jeff Padell will introduce you to the basics of taking your equipment outside and using it to find the beautiful celestial objects waiting to be seen through a telescope. From setting our equipment up, to learning how to find some easy and challenging objects, to care and maintenance of your instrument, Jeff

will have you enjoying your new hobby, or learning which telescope is right for you, before the night is over.

December 3: Introduction to Astrophotography

Have you ever looked at a beautiful astronomy image and wondered whether you could come close to taking something as breathtaking as that? Although none of us can compete with those from the Hubble Space Telescope, you can, with very little help, soon be taking astroimages you can be proud of.

Bob Horton and Jim Hendrickson, both members of Skyscrapers, Inc., have been taking incredible images of celestial objects for many years. They will tell you exactly what you need to start, and give you pointers to begin to create your own astrophotos. Come and learn a new and beautiful hobby!

Transit of Venus Finding May Help Detection of Exoplanet Magnetic Fields

by Francine Jackson

I'm sure there are some of you out there as entranced with the planet Venus as I am. After all, it is the planet closest to us in distance, size, and gravitation, yet, is as far from us as possible with its horrendous temperature, stifling atmosphere, and ability to change anything attempting to land on the surface into a pancake. Yet, when you look up at it, you are seeing what our ancestors thought was such a beautiful object that they named it after the god of love and beauty. If they only knew.

Hopefully, some of you have been able to notice that Venus is once again coming into our evening sky. As the brightest object after the Sun and the Moon, Venus should be able to be recognized in the west right after sunset, although some people might report it as a UFO. If you know of any who do, please let them know what it is, and that

it belongs there.

Also, many of us were able to observe Venus transit the Sun in 2012 – some hopefully also witnessed it eight years earlier. This unique observation, of Venus crossing the solar disk, won't happen again for any of us alive today; the next is over a hundred years away, in 2117. However, unknown to many of us, the last transit, in addition to being observed by millions of people on Earth, also was observed by an X ray telescope aboard the Hinode craft, which was set to monitor both Venus and the Sun during this time. Its findings included information concerning solar radiation interacting with Venus's magnetic field and being scattered along its tail.

This is important, as it could not only inform us as to Venus's magnetic environment, but could be a useful tool in aiding

us to better understand magnetic fields of exoplanets situated close to their home star.

For us, though, just being able to look at the brilliance of our neighboring planet, despite the knowledge it is giving us, is enough for many of us on a clear, early evening. Venus will be with us for several months, so please go out whenever you can and enjoy the beauty, and mystery, that is within our sight.



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>

Locating Uranus

by Jim Hendrickson

With three of our naked-eye planets setting early in the evening sky and Jupiter dominating the early morning sky, our late evening skies are left to our solar system's two ice giants. Neptune reached opposition in early September and November brings the best viewing opportunities for the seventh planet, Uranus.

From a truly dark sky, Uranus would be at the limit of naked-eye visibility, but it's 5.7 magnitude glow presents little challenge for binoculars and small telescopes even from a light polluted sky.

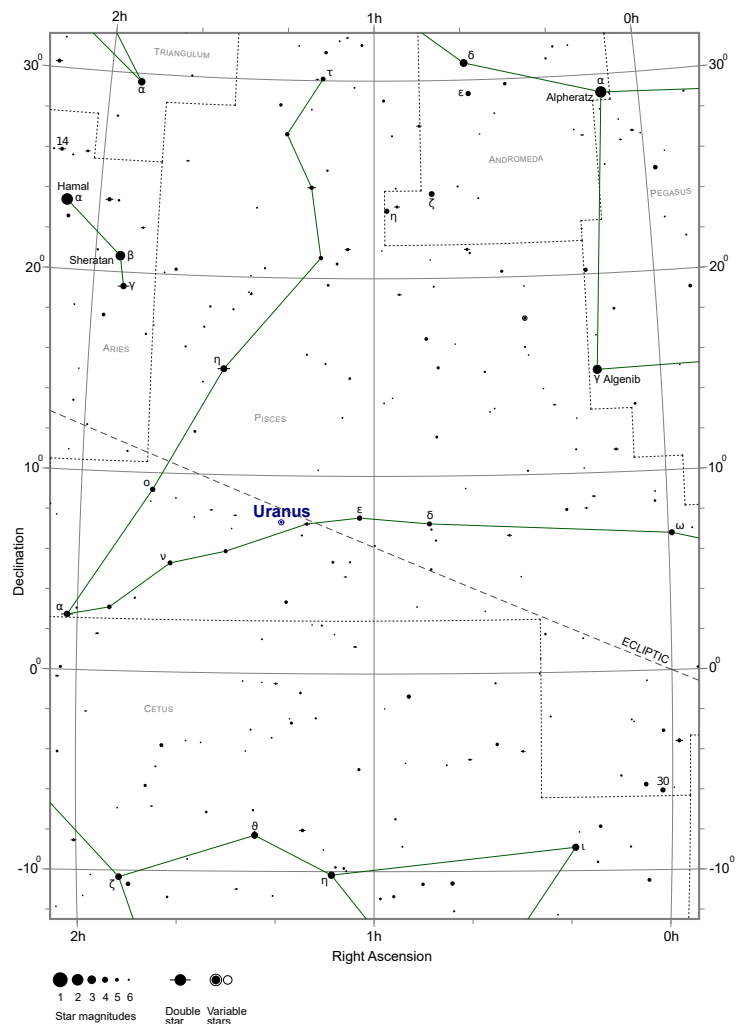
Uranus reached opposition on October 12 and remains visible throughout the night among the stars of Pisces. Climbing higher along the ecliptic, Uranus is favorably positioned for observation for the remainder of the year. Even a small telescope under favorable seeing conditions will be able to distinguish its 3.7 arcsecond disk from the background stars.

Uranus has an extensive system of 27 moons, but unlike Jupiter and Saturn, none of them are easily visible through small telescopes. This is where Uranus presents us a fun challenge. The planet itself won't reveal much detail, but hunting down its moons visually through a large telescope, or photographically through a smaller telescope with tracking capability is well within the realm of possibility. The two largest moons, Titania and Oberon shine at just below 15th magnitude and can be spotted up to 30 and 45 arcseconds respectively from their parent planet. Their orbital periods of 8.7 and 13.4 days are similar to those of Jupiter's Ganymede and Callisto. Are you able to resolve them?



Jim Hendrickson is newsletter and web editor and has been a member for 20 years. See more at <http://theskyscrapers.org/jim-hendrickson>

Uranus - November 2016



The Sun, Moon & Planets in November

This table contains the ephemeris of the objects in the Solar System for each Saturday night in October. Times are in Eastern Daylight Time (UTC -4) through November 5, Daylight Standard Time (UTC -5) beginning November 6. All times calculated for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
Sun	5	14 42.2	-15 44.4	Lib	-26.8	1935.7	-	-	-	0.99	07:23	12:29	17:35
	12	15 10.3	-17 44.9	Lib	-26.8	1939.1	-	-	-	0.99	06:32	11:30	16:28
	19	15 39.2	-19 30.2	Lib	-26.8	1942.1	-	-	-	0.99	06:40	11:31	16:22
	26	16 08.7	-20 58.4	Sco	-26.8	1944.6	-	-	-	0.99	06:49	11:33	16:18
Moon	5	18 42.1	-19 21.5	Sgr	-11.0	1801.6	58° E	23	-	-	12:12	17:14	22:17
	12	0 55.8	2 07.5	Cet	-12.7	2003.8	143° E	90	-	-	15:36	22:14	05:03
	19	8 00.4	16 31.3	Cnc	-12.4	1910.9	119° W	74	-	-	20:51	04:10	11:25
	26	13 40.5	-7 08.7	Vir	-10.1	1751.7	38° W	11	-	-	03:51	09:32	15:07
Mercury	5	15 02.1	-17 37.5	Lib	-0.8	4.7	5° E	99	0.46	1.44	07:55	12:51	17:47
	12	15 46.3	-21 04.5	Lib	-0.5	4.8	9° E	97	0.47	1.42	07:26	12:08	16:49
	19	16 31.2	-23 40.7	Oph	-0.4	4.9	13° E	94	0.46	1.37	07:54	12:25	16:55
	26	17 16.5	-25 18.3	Oph	-0.4	5.2	16° E	89	0.44	1.29	08:19	12:43	17:06
Venus	5	17 21.9	-25 01.8	Oph	-3.9	14.5	38° E	77	0.73	1.17	10:46	15:10	19:35
	12	17 58.9	-25 33.0	Sgr	-3.9	15.1	40° E	75	0.73	1.12	09:57	14:20	18:42
	19	18 35.9	-25 28.5	Sgr	-4.0	15.8	41° E	73	0.73	1.07	10:06	14:29	18:52
	26	19 12.4	-24 48.4	Sgr	-4.0	16.5	42° E	70	0.73	1.03	10:11	14:38	19:05
Mars	5	19 57.3	-22 36.7	Sgr	0.4	7.3	74° E	86	1.38	1.28	13:08	17:44	22:20
	12	20 18.8	-21 25.0	Cap	0.5	7.1	72° E	87	1.38	1.32	11:56	16:38	21:20
	19	20 40.1	-20 03.0	Cap	0.5	6.9	70° E	87	1.38	1.36	11:44	16:31	21:19
	26	21 01.3	-18 31.6	Cap	0.6	6.7	68° E	88	1.39	1.41	11:31	16:25	21:19
1 Ceres	5	1 50.3	-1 35.6	Cet	7.6	0.6	158° E	100	2.87	1.92	17:36	23:32	04:28
	12	1 44.8	-1 37.3	Cet	7.7	0.6	151° E	99	2.86	1.95	16:03	21:59	03:55
	19	1 40.1	-1 30.8	Cet	7.9	0.6	144° E	99	2.86	2.00	15:31	21:27	03:24
	26	1 36.3	-1 16.1	Cet	8.0	0.6	137° E	99	2.85	2.05	14:59	20:56	02:54
Jupiter	5	12 45.9	-3 42.1	Vir	-1.6	31.3	31° W	100	5.45	6.28	04:42	10:31	16:20
	12	12 51.0	-4 13.6	Vir	-1.6	31.7	37° W	100	5.45	6.22	03:22	09:09	14:56
	19	12 55.9	-4 43.5	Vir	-1.6	32.0	42° W	100	5.45	6.14	03:01	08:46	14:31
	26	13 00.6	-5 11.9	Vir	-1.6	32.5	48° W	100	5.45	6.06	02:40	08:23	14:07
Saturn	5	16 54.7	-21 13.7	Oph	0.5	15.2	32° E	100	10.04	10.87	09:58	14:39	19:20
	12	16 57.9	-21 19.5	Oph	0.5	15.2	26° E	100	10.04	10.93	08:34	13:15	17:56
	19	17 01.3	-21 25.1	Oph	0.5	15.1	19° E	100	10.04	10.97	08:10	12:51	17:31
	26	17 04.7	-21 30.4	Oph	0.5	15.0	13° E	100	10.05	11.00	07:47	12:27	17:07
Uranus	5	1 21.2	7 52.0	Psc	5.7	3.7	159° E	100	19.95	19.02	16:33	23:04	04:34
	12	1 20.2	7 46.6	Psc	5.7	3.7	151° E	100	19.95	19.07	15:05	21:35	04:05
	19	1 19.4	7 41.6	Psc	5.7	3.7	144° E	100	19.94	19.14	14:37	21:07	03:37
	26	1 18.6	7 37.3	Psc	5.7	3.7	137° E	100	19.94	19.21	14:09	20:39	03:08
Neptune	5	22 44.9	-8 53.2	Aqr	7.9	2.3	116° E	100	29.95	29.50	14:58	20:28	01:58
	12	22 44.7	-8 54.1	Aqr	7.9	2.3	109° E	100	29.95	29.61	13:30	19:00	00:30
	19	22 44.6	-8 54.4	Aqr	7.9	2.3	102° E	100	29.95	29.73	13:03	18:33	00:03
	26	22 44.6	-8 54.1	Aqr	7.9	2.3	95° E	100	29.95	29.85	12:35	18:05	23:35
Pluto	5	19 05.9	-21 26.5	Sgr	14.3	0.2	62° E	100	33.21	33.66	12:10	16:50	21:30
	12	19 06.5	-21 26.3	Sgr	14.3	0.2	55° E	100	33.21	33.76	10:43	15:23	20:03
	19	19 07.3	-21 26.1	Sgr	14.3	0.2	49° E	100	33.22	33.86	10:16	14:56	19:36
	26	19 08.0	-21 25.6	Sgr	14.3	0.2	42° E	100	33.22	33.95	09:49	14:29	19:10

November Skies Have Something for Everyone

by Dave Huestis

“Looking at the stars always makes me dream, as simply as I dream over the black dots representing towns and villages on a map. Why, I ask myself, shouldn’t the shining dots of the sky be as accessible as the black dots on the map of France?” —Vincent Van Gogh, 1889.

While we still cannot physically reach the stars, our spacecraft have probed the distant regions of our solar system. Although marvelous instruments have imaged the universe in all wavelengths of the electromagnetic spectrum, you and I can experience the majesty of the heavens using our eyes, binoculars, and modest-sized optical telescopes. Fortunately the often clear and transparent skies of November will be host to a wide variety of objects and events to satisfy the exploratory nature of the casual and amateur stargazer alike.

Annually during the first two weeks of November the Earth passes through a stream of debris left in orbit by Comet Encke. These often very bright meteors comprise the Taurid (Northern and Southern) meteor showers. The Taurids are fairly slow and enter our atmosphere at approximately 17 miles per second, resulting in yellow fireballs that often explode and fragment into multiple meteors. Concentrate your gaze toward the constellation Taurus the Bull (find the V-shaped pattern that defines the bull’s face, or locate the Pleiades — the Seven Sisters), but scan around since the Taurids can appear anywhere in the sky. At best, one can expect no more than six meteors per hour.

On Sunday, November 6 at 2:00 a.m., don’t forget to set your clocks and devices (older units don’t automatically accomplish this task) back one hour as we return to Eastern Standard Time (EST) from Eastern Daylight Time (EDT). Everyone knows the phrase, “Spring ahead and fall back/behind.” Failure to fulfill this ritual will result in your being one hour early until you remember to do so.

Furthermore, during the first week of November above the western horizon shortly after sunset, you can still catch a glimpse of Saturn, with brilliant Venus to its left. Higher in the sky to the left you can continue to see reddish Mars. You’ll need

a good unobstructed horizon to view Venus and Saturn through a telescope, and Mars is so distant from the Earth at this time that little detail can be viewed on its surface. Throughout this period a waxing crescent Moon will glide above this planetary grouping. Saturn will soon be lost in the solar glare, while Venus will continue to rise higher into a darker sky as the year progresses.

Throughout November one can still observe the Milky Way as it stretches from the constellation Cygnus towards the western horizon. A dark sky will reveal the myriad of stars of our home galaxy, and even a pair of binoculars will show beautiful clusters of stars within its boundaries. And if you have a small telescope, just scan up and down its length with a wide-field eyepiece. You’ll be rewarded with many fine views of dense star fields.

For those of you who have a good view towards the northern sky, Ursa Major (Big Dipper) sits above the horizon after sunset this month. Watch as the handle of the dipper sinks below the horizon as the constellation rotates counter-clockwise around Polaris, the Earth’s pole star.

Also after sunset you can find the constellation Taurus the bull rising above the eastern horizon. You can recognize this star pattern because it contains two beautiful star clusters. The Pleiades, or Seven Sisters, is easily recognizable, as is the V-shaped cluster called the Hyades. This open cluster contains Taurus’ bright red star Aldebaran, the bull’s eye. Orion rises soon thereafter. Unfortunately that early evening appearance signals that winter will not be too far behind.

On the 14th the closest Full Moon since January 26, 1948 occurs. In recent years the term supermoon has been used to describe a lunar close approach. But a supermoon is really nothing special. The Moon’s elliptical orbit about the Earth produces one perigee (close approach) and one apogee (farthest distance) each month. These extremes vary each time they occur. This upcoming perigee will be the closest (221,524 miles) until November 25, 2034 (221,486 miles). Tides will be high, so let’s hope there are no coastal storms.

Just three days later is the peak of the annual Leonid meteor shower during the early morning hours of the 17th. Unfortunately a waning gibbous Moon on the Gemini/Orion border will overshadow all but the brightest meteors of this display. This scenario is further compromised because the Leonid peak rate is down to its normal level of perhaps 10-15 green or blue shooting stars per hour. The Leonids blaze across the sky at around 44 miles per second as they hit the Earth’s atmosphere nearly head-on. The resulting display produces many fireballs, with about half of them leaving trains of dust that can persist for minutes. The area of sky where the meteors appear to radiate from is in the Sickle (backwards question mark) asterism in Leo. Best of luck in seeing a handful of shooting stars.

And finally, throughout the month, please visit one of the local observatories and ask the telescope operators to show you the two most distant planets of our solar system. Since the demotion of Pluto to dwarf planet status in 2006, those planets now are Uranus and Neptune. These gas giants look like little blue-green disks through a telescope. You won’t see any detail, but you can boast of catching a glimpse of these distant worlds.

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 Wednesday night. Frosty Drew Observatory (<http://frosty-drew.org/>) in Charlestown is open every clear Friday night year-round.

Be sure to check the websites of these facilities before venturing out for a visit. Great American Total Solar Eclipse on August 21, 2017. Countdown: 292 days as of November 1, 2016.

Keep your eyes to the skies.



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>

Star Cloud in Andromeda Galaxy

NGC 206

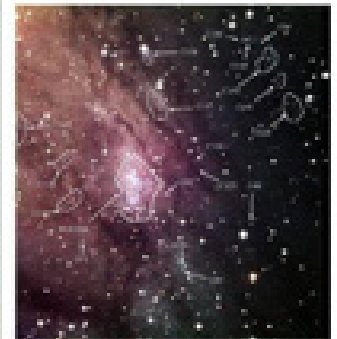
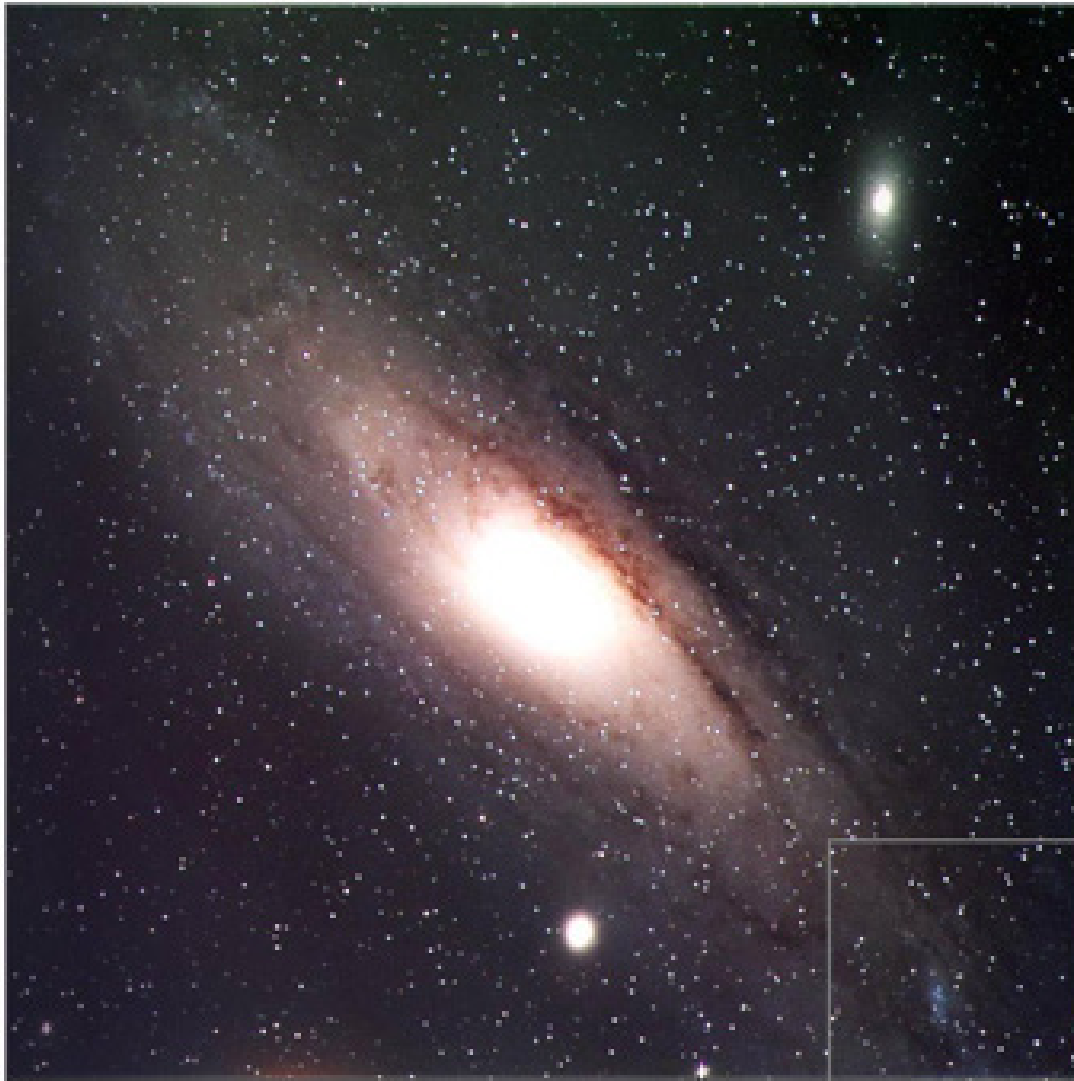
by Las Vegas Astronomical Society

NGC 206 is an enormous star cloud located in the southwest part of the Andromeda Galaxy. In 1786, it was observed as a separate entity by William Herschel, who

catalogued it as H V.36 (the 36th Category 5 [Very Large Nebulae] entry in his deep space catalog. Once categorized by Edwin Hubble as an open star cluster, NGC 206 is now considered to be an OB association. It contains over 300 members, many of which are young O and B type stars and spans about 4,000 light-years.

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 lvastronomy.com/observing-challenge.



www.narrowbandimaging.com

For Sale: Lunt 35mm Ha Solar Telescope Deluxe Package

The Lunt Solar Systems LS35THa dedicated Hydrogen-alpha telescope is the most compact 35 mm etalon system currently available. An unobstructed, front mounted 35 mm etalon provides a bandpass of <0.75 Angstroms. Prominences and some surface detail can quickly be viewed through this very portable single stack system. Original cost was \$700, which did not include the case and 2 eyepieces.

I am asking \$450. Interested? Contact Conrad Cardano cardanoc@verizon.net



Is Proxima Centauri's 'Earth-like' planet actually like Earth at all?

by Ethan Siegel

Just 25 years ago, scientists didn't know if any stars—other than our own sun, of course—had planets orbiting around them. Yet they knew with certainty that gravity from massive planets caused the sun to move around our solar system's center of mass. Therefore, they reasoned that other stars would have periodic changes to their motions if they, too, had planets.

This change in motion first led to the detection of planets around pulsars in 1991, thanks to the change in pulsar timing it caused. Then, finally, in 1995 the first exoplanet around a normal star, 51 Pegasi b, was discovered via the “stellar wobble” of its parent star. Since that time, over 3000 exoplanets have been confirmed, most of which were first discovered by NASA's Kepler mission using the transit method. These transits only work if a solar system is fortuitously aligned to our perspective; nevertheless, we now know that planets—even rocky planets at the right distance for liquid water on their surface—are quite

common in the Milky Way.

On August 24, 2016, scientists announced that the stellar wobble of Proxima Centauri, the closest star to our sun, indicated the existence of an exoplanet. At just 4.24 light years away, this planet orbits its red dwarf star in just 11 days, with a lower limit to its mass of just 1.3 Earths. If verified, this would bring the number of Earth-like planets found in their star's habitable zones up to 22, with 'Proxima b' being the closest one. Just based on what we've seen so far, if this planet is real and has 130 percent the mass of Earth, we can already infer the following:

- It receives 70 percent of the sunlight incident on Earth, giving it the right temperature for liquid water on its surface, assuming an Earth-like atmosphere.
- It should have a radius approximately 10 percent larger than our own planet's, assuming it is made of similar elements.
- It is plausible that the planet would be tidally locked to its star, implying a permanent 'light side' and a permanent 'dark side'.
- And if so, then seasons on this world

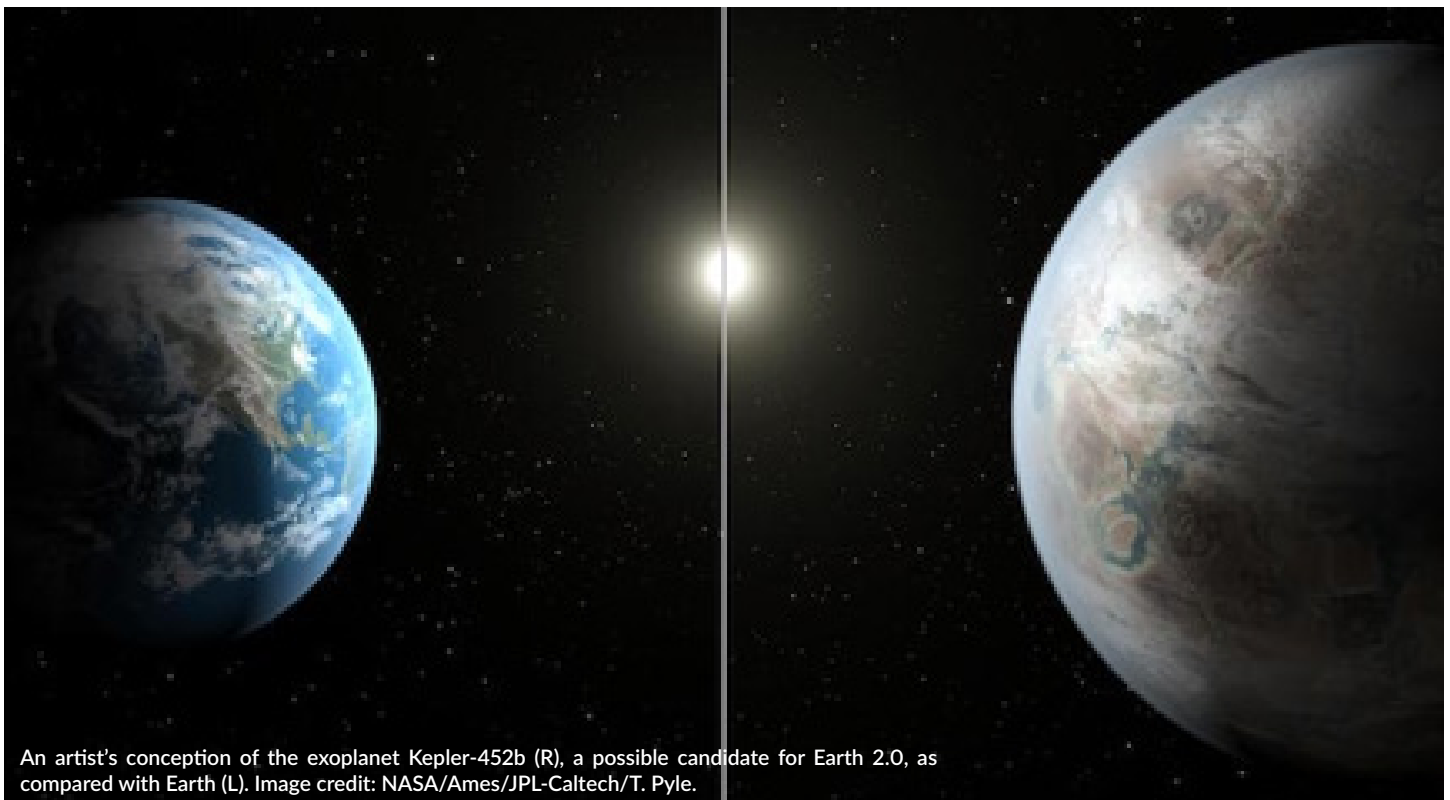
are determined by the orbit's ellipticity, not by axial tilt.

Yet the unknowns are tremendous. Proxima Centauri emits considerably less ultraviolet light than a star like the sun; can life begin without that? Solar flares and winds are much greater around this world; have they stripped away the atmosphere entirely? Is the far side permanently frozen, or do winds allow possible life there? Is the near side baked and barren, leaving only the 'ring' at the edge potentially habitable?

Proxima b is a vastly different world from Earth, and could range anywhere from actually inhabited to completely unsuitable for any form of life. As 30m-class telescopes and the next generation of space observatories come online, we just may find out!

Looking to teach kids about exoplanet discovery? NASA Space Place explains stellar wobble and how this phenomenon can help scientists find exoplanets: <http://spaceplace.nasa.gov/barycenter/en/>

This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



An artist's conception of the exoplanet Kepler-452b (R), a possible candidate for Earth 2.0, as compared with Earth (L). Image credit: NASA/Ames/JPL-Caltech/T. Pyle.

September/October Reports

Skyscrapers Board of Directors Meeting: October 24, 2016 at 7:00 PM Seagrave Observatory

In attendance: Kathy & Steve Siok, Jim Crawford, Francine Jackson, Jim Hendrickson, Ian Dell'Antonio, Matt Oullette, Tracy Prell, Lloyd Merrill, Bobby Napier, Jeff Padell

Agenda

1) Trustees - Jim

The security camera and burying the wires will be tabled for now. The Porta-potty will be removed at the end of November. Relating to the 16" telescope, a focuser will be purchased by Jim and Bobby Napier, since Jeff Padell and others will provide donations to cover the cost.

2) Membership - Lloyd

Skyscrapers has received about \$20 from the Amazon Smiles program so far. S & T and Astronomy magazines will be removed from the membership options.

3) Fall Workshop Sessions - Francine

The remaining Saturday Schedule is:

Francine - October 29, Steve H. - November 5, Jeff - November 19, Bob and Jim - Dec 3

4) Upcoming Star parties, Library telescopes, and statewide star parties - Francine

Friday 11/18 Star Party @ Seagrave 6PM

New Ideas: "Library Telescope" Program was discussed. This would support local libraries who purchase small telescopes to lend out to community members. The program is by a local astronomy group - giving advice to patrons about using the telescopes and making minor repairs to the instruments. Board members were asked to contact their local libraries to see if there is any interest in this program. There is more information about how this works in an article in S & T magazine. Also, we will obtain a copy of the article and see if its author could speak about the program at one of our monthly meetings. "Local Star Parties" Holding small star parties in people's towns and neighborhoods was also discussed. These ideas will be discussed further with more input at subsequent Board meetings. It would be reasonable to put together a plan to roll out these new programs to the membership.

"Observe the Moon" and "Observe the Sun" sessions should be scheduled by Skyscrapers regularly for the Spring and Fall.

The 2017 Eclipse details for those staying in Rhode Island is a great topic for the coming year.

Francine distributed a blog about light pollution from the Conservation Law Foundation.

5) Future meetings - Ian

Sat Nov 12th - Tim Barker (Moon Rocks)
Sat Dec 10th - Al Hall & Dick Parker (Twin Telescopes) and Holiday Party @ Community Center

Sat Jan 6 - "The Jazz of Physics" speaker from Brown U. @ Community Center

Sat Feb 6th - Conrad Cardano (Backyard Observatory)

6) AstroAssembly: Update for 2016 - Kathy

Profits: \$2800+ (Tracy gave \$1000 of this profit)

Astrophoto contest popular voting was very successful and will be continued. Main speaker was well-received and the event was a great success even with the rainy weather. More volunteers are needed to make the day run smoothly in the future. Subcommittee was appointed for future planning that will report to the Board. This will address the organization of volunteers and tasks to improve the running of this event. Kathy & Steve Siok, Jim Crawford, Bob Horton will meet after the holidays.

Other Business

Annual Calendar It was suggested that Skyscrapers start an annual calendar to post events for the group. This would prevent scheduling conflicts and inform everyone of what is going on.

Finding a place to post this on the website would have to be worked out along with other details.

Next Executive Committee meeting: Monday November 21st @ 7 PM at Seagrave

At this meeting a major topic of discussion will be defining policy for group visits to Seagrave and remote star parties. Please come with your ideas.

Other items (as time permits):

Plans for the December Meeting
"Library Telescopes" and Local Star Parties

Astronomical League <https://www.astroleague.org/content/library-telescope-program>

Adopt a library (Mass) <http://aldrich.club/adopt-a-library-telescope/>

Cumberland <http://www.cumberlandli->

brary.org/circulating-telescope

Respectfully Submitted,

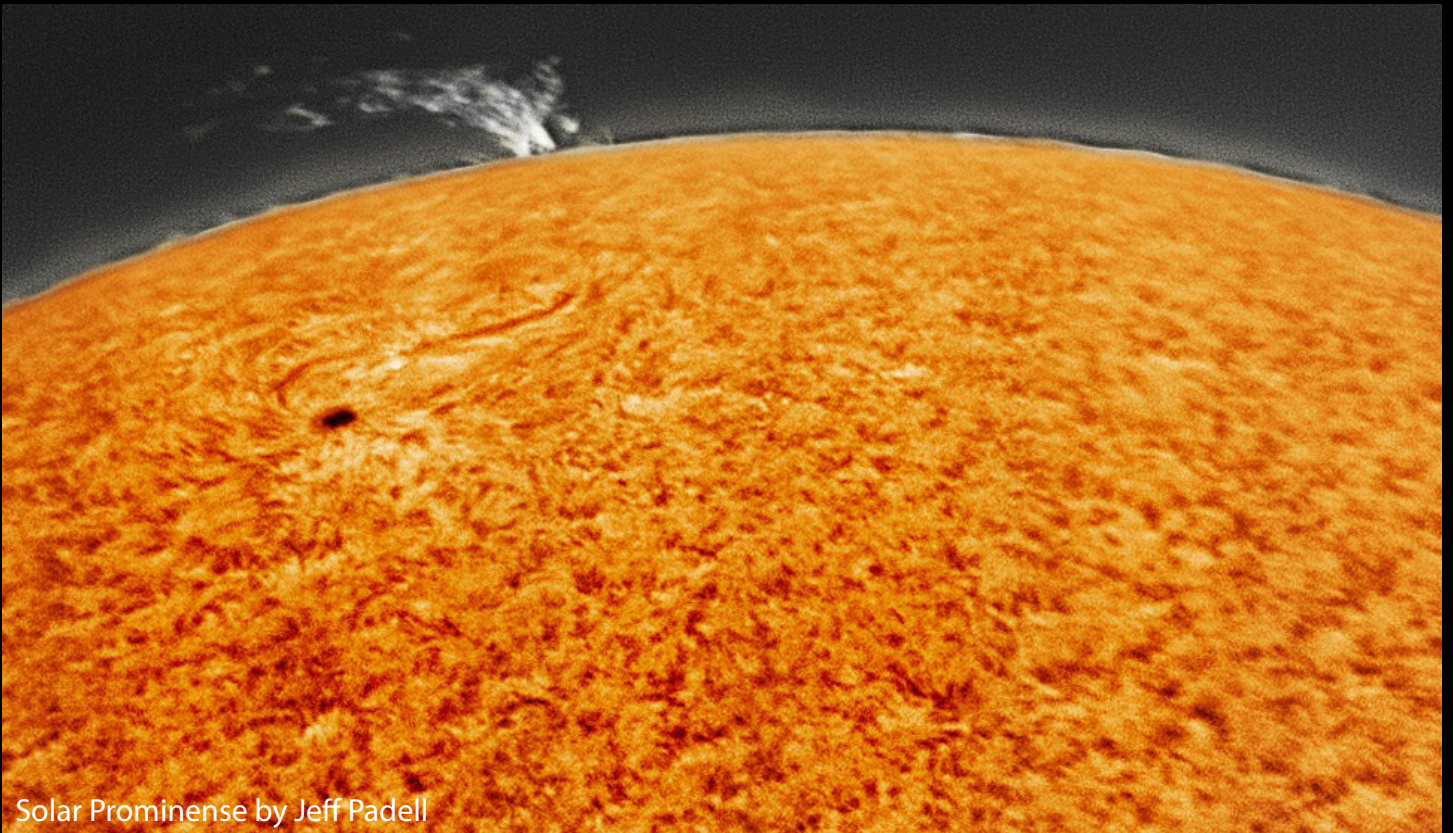
Kathy Siok, Secretary Pro Tem

Cash Flow YTD 2016 4/1/2016 through 9/30/2016

Category	4/1/2016-9/30/2016
INFLOWS	
AstroAssembly	
Banquet	975.00
Doations	1,000.00
Registration	830.00
TOTAL AstroAssembly	2,805.00
Donation	
Misc Donation	959.67
TOTAL Donation	959.67
Dues	
Family	540.00
Junior	15.00
Regular	1,100.00
Senior	575.00
TOTAL Dues	2,230.00
Misc Income	
Interest Inc	3.05
TOTAL Misc Income	3.05
Star Party Donations	70.00
TOTAL INFLOWS	6,067.72
OUTFLOWS	
Astro Assem Exp	
Cash Bank	460.00
TOTAL Astro Assem Exp	460.00
Corporation, State Fee	125.00
Misc Expenses	96.68
PayPal Fee	42.11
Postage and Delivery	48.72
Trustee Expense	
Property Maintenance	439.88
TOTAL Trustee Expense	439.88
Utilities	
Electric	82.92
Internet	419.94
Porta-John	594.00
Propane	80.25
TOTAL Utilities	1,177.11
TOTAL OUTFLOWS	2,389.50
OVERALL TOTAL	3,678.22

Cash and Bank Accounts - As of 9/30/2016

Account	9/30/2016 Balance
Bank Accounts	
PayPal Account	150.69
PCU CD	20,008.88
PCU Checking	9,811.36
TOTAL Bank Accounts	29,970.93
OVERALL TOTAL	29,970.93



Solar Prominense by Jeff Padell



Crater Copernicus by Jeff Padell



Antares OA-5 rocket launch seen from Sabin Point, East Providence. On Monday, October 17, an Antares rocket carrying a Cygnus cargo resupply module to the International Space Station launched from Wallops Island, Virginia. Night launches from this facility are usually visible from Rhode Island. The most notable one in recent years was the Lunar Atmosphere and Dust Environment Explorer (LADEE) in 2013. Last month's Antares launch was obscured by clouds, but this 2-frame composite by Jim Hendrickson captures its faint arc across the southern sky over Narragansett bay.



Andromeda Galaxy images by Tom Thibault on October 19, imaged through an Astro-Tech 65EDQ with a Celestron Nightscape 8300C. (11) 3 min. exposures, (5) 3 min. darks, and (6) Bias, Processed with AFX, DPP, and Photoshop

AstroAssembly Photo Gallery

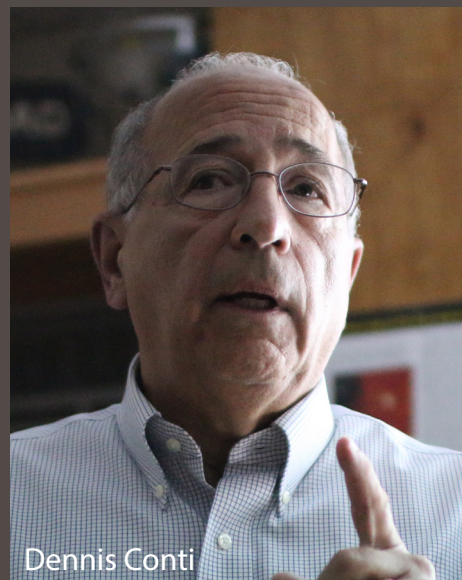
Photos by Tracy Pr ell & Jim Hendrickson



AstroAssembly Friday Evening



Stephen LaFlamme



Dennis Conti



Bob Napier



AstroAssembly Saturday Morning



Tina Huestis & Linda Bergemann at Registration & Raffle table



Dan Lorraine & Jim Crawford on the Lunch Grill



Michael Rudenko



Jeff Norwood



Scott MacNeill



AstroAssembly Saturday Afternoon



Astro Bake-off





Master of Ceremonies Steve Hubbard



Jeff Padell at the telescope demo tent



Astrophoto Contest



Camera Concepts



Camera Concepts & Telescope Solutions

CCTS

Serving the Astronomical Community since 1985

www.cameraconcepts.com

TELEGRAMS SCOPE COVERS ON SALE HERE



AstroAssembly Saturday Evening



Astro Raffle





Star Parties & Observing Reports



Friday, September 9 at River Bend Farm, Uxbridge MA

We had a great time at the River Bend Farm in the Blackstone River and Canal Heritage State Park located in Uxbridge, MA. When we arrived, the Park Rangers gave us a very warm welcome and were happy to see us. I want to personally thank Blackstone River and the Canal Heritage State Park for inviting Skyscrapers, Inc. Amateur Astronomical Society of Rhode Island to put on a star party for their visitors and our many members who took their personal time and provided their telescopes and equipment for all to enjoy! We had a

nice steady stream of visitors young and old looking at our telescopes and cameras in amazement asking my questions before the sky darkened. As the dark of the night settled in and the clouds cleared out, they were stunned by the beautiful images that they

saw through the many different types and sizes of telescopes that our members set up.

Saturday, September 24 at Fort Hill Farms, Thompson CT

We all had a such a wonderful time last night (Sept 24th) at a star party hosted by my organization Skyscrapers, Inc. Amateur Astronomical Society of Rhode Island at Fort Hill Farms!

Kristin, the owner of Fort Hill Farms was so happy to see us again and gave all of our volunteers a very warm welcome just like we were her family! This young lady has a big smile and a heart of gold.

I was the first one to arrive with Skyscrapers members Francine and Jim arriving a few minutes later. Kent Cameron along with his lovely wife Connie, Jerry Scala and John Kocur also joined us in the star party. Our volunteers brought their personal equipment, knowledge and enthusiasm providing the "eyes" for the public to view the many stars, planets, nebulae and galaxies on a beautiful cloudless night. It was a tad on the cool side that early evening and I was wearing my The Mars Generation hoodie. Thank you Astronaut Abby, Nicole Harrison and the The Mars Generation for keeping me warm last night during our public outreach event!

Since we arrived early and it was still relatively light outside, Francine, Jim and I decided to take a walk through the corn maze at Fort Hill Farms.

Jim and I followed Francine, who I refer to as the "Lady of the Constellations"





because Francine has the uncanny ability to look up at the sky and pin-point our exact location better than any GPS device on Earth or reconnaissance satellite in orbit.

As we followed Francine for awhile...I was wondering! It seemed like we've become totally lost within the corn maze. Then I realized that without the stars in the night sky...Francine was unable to find our way out!

We could barely see the sun through the very tall corn stalks that surrounded us in every conceivable direction. While walking through the maze we were provided clues by markers placed along the path. All of us being astronomers were totally baffled by the clues and were scratching our heads because we couldn't for the life of us figure these clues out. At one point I was wondering if we were going to make it out of the maze in time for the star party we were supposed to host. But after seemingly going around in circles for who knows how long, we finally found our way out.

As Venus began to set in the western sky just above the horizon, I set up my camera

with the 200 mm f/2.8 lens and was able to capture it as it was slowing dropping out of sight behind the distant trees. Our other volunteers were setting up their telescopes and ensuring they were ready for the public to look through.

Soon afterward, the stars and planets appeared and we targeted our telescopes and camera to these beautiful wonders of the night sky.

We were swarmed by the many children and their parents that had just found their way out of the corn maze and were anxiously waiting in line at each telescope to see the many different objects in the night sky. Through our telescopes the children and adults were able to view Mizar, Messier objects M11, M7, M8, M13 and the Coathanger which is an asterism also known as Brocchi's Cluster located in the Constellation Vulpecula, various areas of the Milky Way and the Andromeda Galaxy! I used a variety of telephoto and wide angle lens on my Canon EOS 70D and was able to capture Venus, Mars, Antares, and the Milky Way. I had the ability to display and enlarge these images on my LCD screen for the children and adults to gather around to see.

Everyone had a great time with lots of questions about our planets, stars and astronomy in general. Fort Hill Farms has a concession stand where they sell homemade ice cream and other goodies. There were five children asking their parents for



some ice cream. I had a "feel good" moment and treated all of the kids to ice cream last night.

Did you know that Fort Hill Farms also has a cat named Sam who has a PhD in Astronomy? Sam was very interested in our telescopes and my camera! As I was attempting to take a photo of Sam on the table, he jumped off the table and approached me and wanted to let me know my lens cover was still on! Sam then walked over and visited all of our volunteers in the field and checked out all of various types of telescopes we were using!

The children, their parents and out volunteers enjoyed a great evening at Fort Hill Farms. I want to personally thank all of our volunteers from Skyscrapers who loved to share their time, equipment and knowledge of astronomy with adults and children alike.

I know all of our members went home knowing we made a positive difference in our world...and I will tell you, that feeling is priceless.

Thank you Kristin and Fort Hill Farms for your kindness and hospitality...it was terrific.

Saturday, October 8: International Observe the Moon Night

Rainy conditions caused the cancellation of 2016 International Observe the Moon Night at the Rhode Island State House. Plans are being made for next year's event.



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