



the Skyscraper

vol. 41 no. 10
October 2014

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

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Upcoming Meetings

Friday, November 7
Seagrave Observatory

Dr. Alan Powers "The Worlds of Giordano Bruno"

Saturday, December 13
North Scituate Community Center

Dr. William Waller "The Milky Way – An Insiders Guide"

Saturday, January 10
North Scituate Community Center

Rich Nugent "Observing Satellites"

Friday, February 6
North Scituate Community Center

Dr. Alan Hirshfeld "Starlight Detectives: How Astronomers, Inventors and Eccentrics discovered the Modern Universe"

Friday, March 6
Cormack Planetarium

Planetarium Show



Phases of the Moon

First Quarter Moon
October 1 19:33

First Quarter Moon
October 31 02:48

Full Hunter's Moon
October 8 10:41

Last Quarter Moon
October 15 19:12

New Moon
September 23 21:57



Seagrave Memorial
Observatory
Open Nights

Saturdays at 7:00 pm
weather permitting



Trustees' Message

Tom Thibault

Skyscrapers Members,

I'm sure many Skyscrapers Members and guests that attended AstroAssembly have seen the results of the facility maintenance and improvement projects completed to date at Seagrave. The activities undertaken by the Trustee's could not have been accomplished without the support of numerous volunteers. A number of work sessions were scheduled and completed that included the following activities.

Meeting Hall: Replacement of the Meeting Hall ceiling and removal of soiled

insulation. Interior painting and cleaning. Addition of Refreshment Area. Reorganization and relocation of the library and storage cabinets. Exterior repairs, painting and increased electrical outlets.

Clark Observatory and Ante Room: Interior painting and cleaning. Exterior repairs and painting. Addition of current activity white board

Grounds: Removal of downed trees. Trimming and Brush removal. Addition of wall on concrete pad (Grille Area). Replacement of rails on 16" Meade Roll-off

Trustees Conrad Cardano, Jim Crawford and Tom Thibault would like to extend a very appreciative thank you to the following individuals for all their efforts, hard work and contributions that resulted in the revitalized appearance of Seagrave Observatory for our Centennial Anniversary.

Skyscrapers Members: Alex Bergmann, Al Caldarone, Kent Cameron, Jim Hendrickson, Steve Hubbard, Dave Huestis, Bob Napier, Matt Ouellette, Tom Rinaldi, Steve Siok, Ellsworth Starring, and Matt White. A special thanks, to Bob Stahlbush for his multiple sessions working alone with Jim Crawford, which is challenging enough on its own merit, only kidding Jim.

Non members: Brian Crawford and Adam Thibault.



Upcoming Star Parties

Matt White

The remainder of October, and November are looking very busy for star party requests.

We have two more events scheduled at the observatory, October 29th (students from Bryant University), and November 10th (a cub scout group) (Kent, Matt W, Steve Hubbard, Matt O.). Dave has told me that the Bryant event is covered. Please check your availability and let me know.

November 13, (rescheduled from October 7), St. Luke's School, Barrington. I'm told this event will host at least 200 people

so I could really use help here. (Kent, Matt White, Matt O.)

November 21, Portsmouth Middle School. (Kent, Matt W, Matt O.)

In addition, a professor from Providence College wants to bring 100 students, (In four groups of twenty five.) to the observatory sometime in November. The only way I'm going to squeeze this one in, is to utilize the meeting night, and two of the scheduled Saturday open nights. I will schedule one addition evening. I also have a request to do a program at the Ionic Lodge. Two

people should be able to handle this and the lodge is going to provide a free meal. This event is on November 1st.

Please let me know as to your availability and whether you can bring a scope. I've had a couple more volunteers but I'm still short of where I need to be. Thanks to Steve, Kent, Matt and Dave for the quick response.

Thanks,
Matt ka1bqp@msn.com



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 **October 24** 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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Friday, October 10

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

University of Rhode Island Planetarium
Upper College Road
Kingston, RI

Friday, October 10th, 2014
6:00 and 7:00 P.M.

Contact: Francine Jackson: 401-527-5558

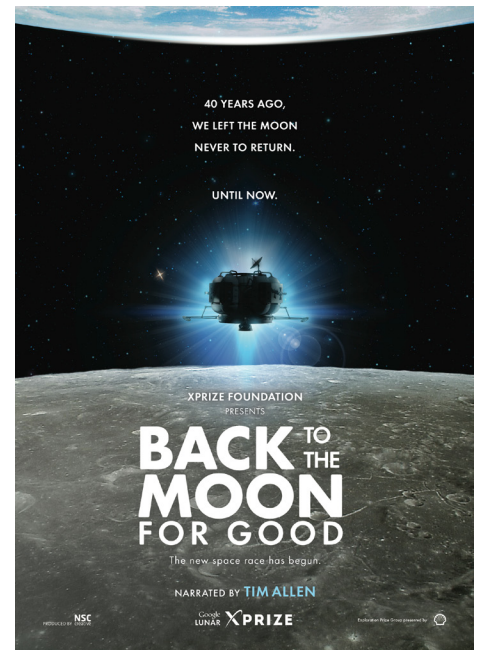
It's been over 45 years since humans have walked on the Moon. But, are there plans to go back? Should we? Could we? How could this happen? Please join the URI Planetarium as it debuts this award-winning show about the possibility of returning to our one and only natural satellite. "Back to the Moon for Good" will be

shown Friday, October 10th, at 6:00 and 7:00 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.

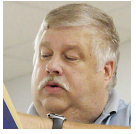
Admission is only \$5.00, to benefit the University of Rhode Island Planetarium Fund.

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.



M31 Andromeda Galaxy by Tom Thibault.



A Busy Month for Astronomy Enthusiasts

Dave Huestis

Many amateur astronomers look forward to the cooler and less muggy days of fall, which occurred back on September 23. The Sun sets earlier and earlier each night, allowing us to begin our observing sessions during the early evening hours. While this October has a little bit of everything to please even the casual stargazer, the phrase “location, location, location” is going to be a key factor in determining what will be seen.

First up on the morning of October 8 is another total lunar eclipse. You may remember back on April 15 we were clouded out during the last one. Unfortunately we are not favorably located this time around to observe the eclipse in its entirety. To do so you’d need to travel out to the West Coast. However, if you are limited to the southern New England area, you will be able to follow some of this celestial ballet as the Earth’s shadow sweeps across the lunar surface.

While the beginning of the eclipse occurs in a dark sky at 4:15 a.m. (all times are EDT) with the Moon 26 degrees above the west-southwest horizon, this phase is too dim to be noticed. Only as the Moon slides deeper into the Earth’s light penumbral shadow will an observer notice a subtle darkening of the left hand portion of the lunar surface. At 5:15 a.m. the Moon will enter the dark umbral shadow and the partial phase will be underway. The Moon will then be only 16 degrees above the horizon. After this point dawn’s early light will become apparent. By the time the Moon is completely within the shadow at 6:25 a.m., it will only be about four degrees above the western horizon. The sky will be quite bright, since the Sun will rise at 6:50 a.m. Locally we will not see the end of totality, or the remainder of the eclipse. To observe this event in its entirety you’d have to travel west to at least the Rockies.

Hopefully the weather will cooperate here so we can enjoy a part of this beautiful sky show.

At the same time the Earth encounters the annual Draconid meteor shower. This minor display of shooting stars only produces ten or less yellowish slow moving meteors per hour. Though the Full Moon will most likely wash out these meteors, if

you happen to see one in the northern sky emanating from the constellation of Draco then consider yourself lucky.

There is an astronomical event you will be hearing a lot about in October, which is the close encounter of Comet Siding Spring (C2013 A1) with Mars. It will come within about 82,000 miles of the red planet on October 19 at 2:28 p.m. EDT. Instruments in orbit around Mars and on the surface will be directed to observe this unique event. Some astronomers have indicated that a telescope four-inches in diameter or larger might be able to observe this encounter.

At the time of close approach Mars will be approximately 151 million miles from the Earth. It will appear as a tiny red disk in an eyepiece. Recent research indicates the comet is only just under ½ half mile across. While the comet’s coma (the surrounding dust cloud) is estimated to be about 12,000 miles across, it is very tenuous. I am extremely skeptical about one’s chances of detecting the comet from the Earth with anything but large professional telescopes. However, if you wish to give it the old college try,

Mars will be in the constellation of Ophiuchus, low in the southwestern sky after sunset.

Two days later on the morning of the 21st, we can expect to observe about 20 or so yellow and green meteors per hour during the Orionid meteor shower. The Moon will be in a waning crescent phase and will not interfere with seeing this shooting star display to best advantage. These remnants of Halley’s Comet disintegrate in our atmosphere at around 41.6 miles per second. The Orionids are also noted for producing

fireballs that create persistent dust trains as they blaze across the sky.

The meteors appear to radiate out of the sky just above Orion’s head (hence the name of the shower) and not far from the bright red super giant star Betelgeuse, which marks his right shoulder. While Orion is an easy star pattern to identify, at 3:30 a.m. this giant constellation can be found due south of your location and about half-way up above the horizon. Maximize your meteor count by observing between midnight and dawn.

And finally, a partial solar eclipse will be visible throughout almost all of the United States on October 23. Almost is the key word, for here in Rhode Island the eclipse begins just after sunset. In fact, we miss even a small partial by only a few miles. If you travel to Hartford, Connecticut, and you can find an absolutely dead horizon, you’ll be able to see just a tiny portion of the solar disk obscured by the Moon as the Sun sets. The farther west and northwest one travels, more of the Sun will be covered. At eclipse maximum just less than two-thirds of the Sun will be covered by the Moon. So head west if you wish to experience one of Mother Nature’s special astronomical events. Or find a live webcast on the Internet. Should you have an opportunity to observe this event firsthand, be sure to use a method that protects your eyes from injury.

In conclusion, please remember that the local observatories are open for your viewing pleasure. Visit their respective websites for public observing schedules. Seagrave Memorial Observatory in North Scituate is open every clear Saturday night. Ladd Observatory in Providence is open every Tuesday night. Frosty Drew Observatory in Charlestown is open every clear Friday night.

Seagrave and Ladd will not be open for the total lunar eclipse. Check the Frosty Drew website for any plans they may have as the event nears.





Fomalhaut

Francine Jackson

Although families don't often do this anymore, as the TSA frowns on the practice, when I was a kid I often went with my family to the local airport to watch the planes. Looking for them to come out of the sky, then watching others leave the ground and disappear somewhere overhead made for a good change from watching TV all night.

Also, sometimes we were able to watch planes that come in within our line of sight. Starting as a faint light just in front of us, which gradually increased in size, we loved to watch as these points would become three-dimensional, and land just hundreds of feet in front of us.

But, sometimes, one of these lights didn't budge. At this time of year, especially, one light, rather low to the horizon, would just shine with the same brightness, never changing, never showing its red and green side lights, just there. It took a long time before I realized that light would never change, as I had found the star Fomalhaut.

The southernmost of the twenty brightest stars from our position here on Earth, Fomalhaut is also one of our closest neighbors, located only about 25 light years from here. Located within a rather unnoticeable constellation, Piscis Austrinus, the Southern Fish, Fomalhaut shines with an apparent magnitude of just over 1. However, its position in the sky, directly below large but nondescript Aquarius, the Water Bearer, seems to allow it to appear brighter than

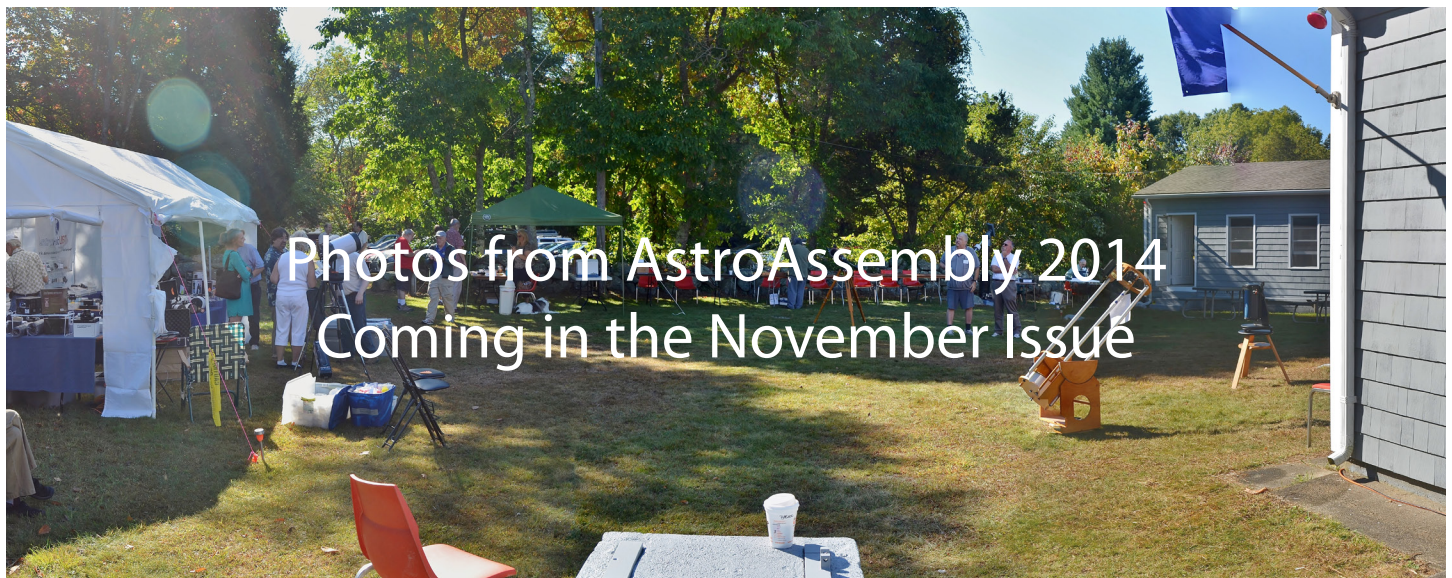


it is, kind of like Polaris, our North Star, which, because it also is in a region of faint stars, fools the eye, looking like a brighter beacon in the north. In fact, the two stars are loosely related, as, if you continue the line from the Big Dipper to the North Star and follow it downward, it would point very closely to Fomalhaut.

Fomalhaut has been called one of the four "Royal Stars" of astrology, along with Regulus, Aldebaran, and Antares, as it believed that each season needed a stellar guardian, and these stars were perfect Guardians of the Sky for the four seasons. They were also often referred to as the "Four Horsemen of the Apocalypse." As the southernmost of this group, it is the one seen the least, as it is only above the horizon for about eight hours at this latitude.

However, despite its short time in our sights, apparently it is home to its own planetary system. Fomalhaut is, in fact, the third brightest star in our sky to have planets, after Pollux and our own Sun.

Martha Evans Martin, in her small but beautifully written *The Friendly Stars*, refers to Fomalhaut as the definite sign of autumn. By the time of its night appearance, the birds have "ceased to sing," the insects have stopped their "shrill notes," and winter is fast approaching. She also thinks of its being alone as a bright fall star, as, "[I]ts serenity [is] in no wise disturbed and its beauty in no wise eclipsed by the more spectacular entrance of the brilliant winter stars now gathering in the east." A more beautiful note for a solitary star would be hard to find. Thank you, Martha.





Globular Cluster in Capricornus

Messier 30

Glenn Chaple

During October, Ophiuchus, Scorpius, and Sagittarius depart the evening sky, taking with them their ample cargo of globular star clusters. A few stragglers remain accessible to backyard telescopes – among them, Messier 30 in Capricorn.

M30 was discovered by Messier in 1764. He described it as a round nebula, containing no stars. Its stellar nature fell to the watchful eye of William Herschel, who resolved M30 twenty years later.

Recently, I observed M30 from a suburban location on an evening when the naked eye limit was about 5th magnitude. It was readily visible through 10 X 50 binoculars, appearing as an out-of-focus 7th magnitude star just a half degree west of the 5.5 magnitude star 41 Capricorni. A 4-inch f/10 reflector at 120X didn't resolve any stars, but it did reveal M30's highly concentrated nucleus. In my 10-inch f/5 reflector at 208X, the outer parts of M30 were resolved. The cluster spanned some 5-6 arc-



Photo by Mario Motta, MD

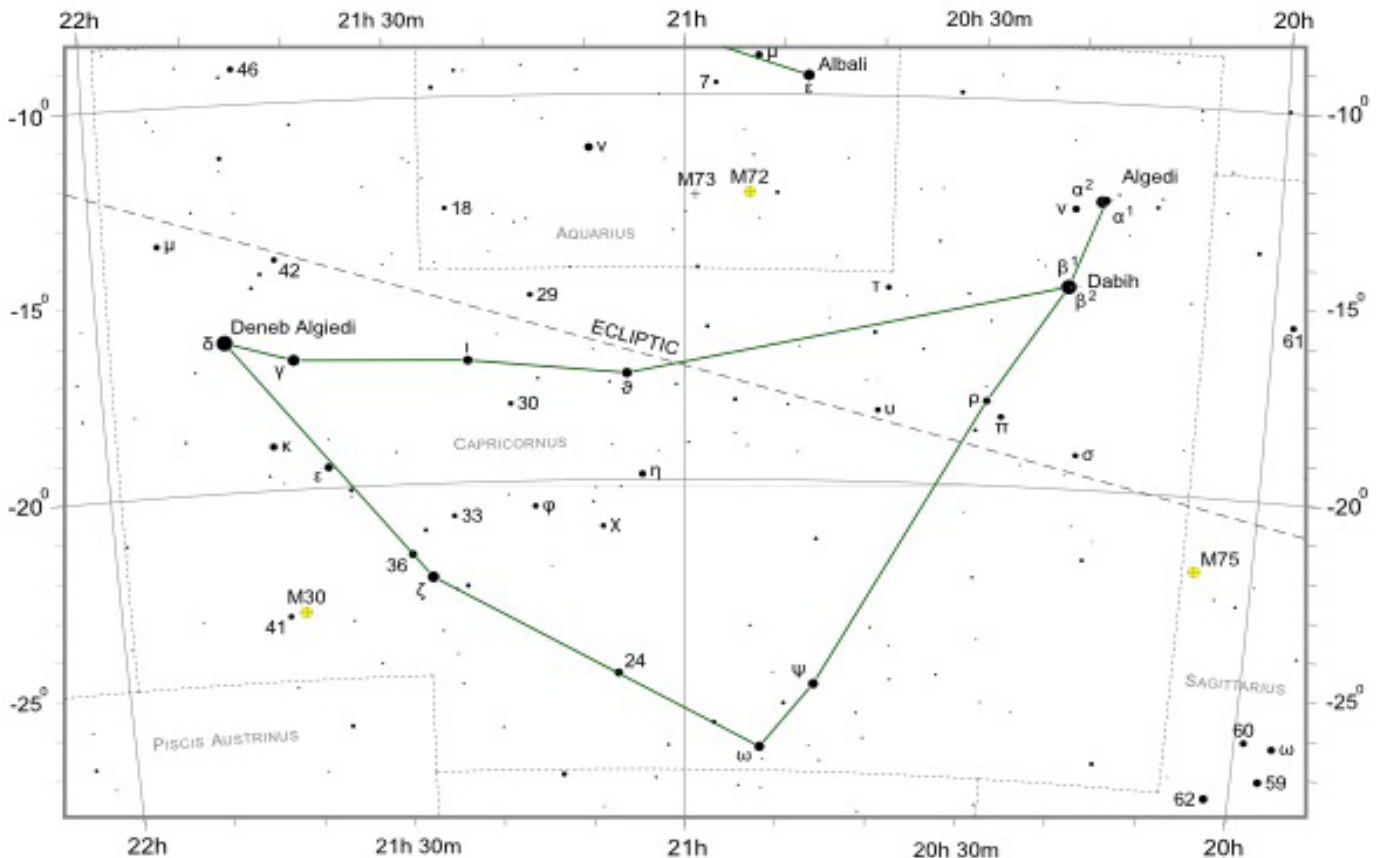
minutes and seemed elongated in an east-west direction. Two stellar streams radiated outward towards the north.

earth. It harbors several hundred thousand stars and has an estimated diameter of 90 light-years.

M30 lies about 27,000 light-years from

Messier Finder Chart for M30, M72 and M73

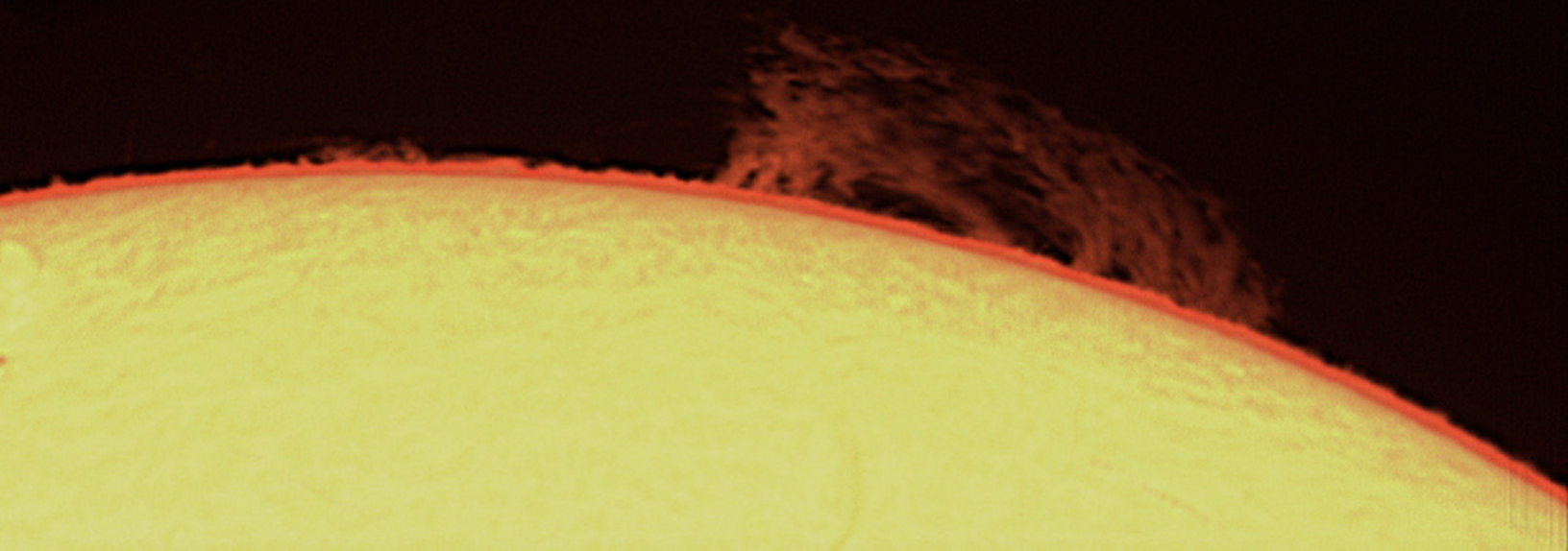
Also shown M75





Aurora borealis made a (brief) appearance in Pascoag, Rhode Island on the evening of September 12. Photo by Jim Hendrickson.

A large solar prominence visible at midday on September 19. Photo by Steve Hubbard.



AUGUST & SEPTEMBER REPORTS



Secretary

Tina Huestis

Skyscrapers August Meeting Minutes – 8/1/2014

First Vice-President Kathy Siok called the Skyscrapers' August meeting to order at 7:20PM.

First Vice-President, Kathy Siok: Kathy announced that she would be filling in for President Bob Horton, who could not be in attendance that evening.

Treasurer, Linda Bergemann: Linda reported no new members for the month. • Voted into membership at the August meeting were Al Caldarone (of Chepachet, RI) and William Kraimer (of Niantic, Connecticut). • Joseph Filocco (of Greenville, RI); Mark Sweberg (of Warwick); and Taylor Iascone (of Johnston) were not present for voting.

First Vice-President, Kathy Siok: Kathy reminded members that the September meeting would be held on Friday, September 5, at the North Scituate Community Center at 7:00PM. Dava Sobel, author of *Galileo's Daughter*, *Longitude*, and *A More Perfect Moon* will be the speaker. Kathy encouraged people to bring their own copies of any Sobel books with them that night. Dava Sobel will be happy to sign them.

2nd Vice President, Steve Siok: Steve reported that the Astro-Assembly program (September 26– 27) has been solidified. • Scituate town historian Ray Wolf will give the Friday evening talk, which will cover the time period of Frank Seagrave, as well as how the creation of the reservoir significantly changed the culture of the town. • Steve mentioned that poster sessions are a new feature being introduced for Saturday. These sessions will be about astronomy projects presented in an informal "show & tell" poster format in the Meeting Hall. If anyone is interested in learning how they can present a poster session, contact Steve. • Afternoon presenters will be: Dave Huestis giving a history of Seagrave Observatory; Rich Sanderson speaking about the Springfield Planetarium's star projector; and Andrew Szentgyorgyi talking about the Giant Magellan Telescope's first light instruments and its search for exo-planets.

• Owen Gingrich has agreed to be the Saturday evening feature speaker. He will present a thumbnail view of 1914 astronomy as it would have been during the time period of Frank Seagrave. • Kathy reminded everyone that Astro-Assembly is the organization's primary fundraiser and that raffle and door prizes donations are actively being sought. If anyone is interested in donating, contact Kathy. Donations are tax deductible. • She also encouraged volunteer sign ups during the event to help with parking, food/grille set up, clean up, and other general duties. • Pre-registration is \$25 for nonmembers, \$20 for members. • The Saturday evening banquet will be held in the Community Center.

Historian, Dave Huestis: Dave reported that he located descendants of the Seagrave family (although Frank Seagrave never married nor had children). Two great-nieces living in Connecticut showed an interest in coming to Astro-Assembly and, from Wisconsin, a descendant of Revolutionary War officer Captain Edward Seagrave may also attend.

Trustee, Conrad Cardano: Conrad announced that Saturday's public open night was cancelled due to weather. • He was also cancelling Saturday morning's outdoor project work session. • Tom Thibault noted that an indoor work session was still going forward, and if anyone was interested in helping, to show up at 9:00AM. • The outside work session was rescheduled for the following Saturday at 9:00AM.

Francine Jackson: Francine noted that September 6 was the "International Observe the Moon" night. If interested, contact Bob Horton.

Kathy Siok introduced Dr. David Kipping, of the Harvard Smithsonian Center for Astrophysics, and his talk on Exo-Moons.

Speaker, Dr. David Kipping: Dr. Kipping explained that his talk would cover why exo-moons are of interest, how they can be found, and how close they are to achieving this goal. Exo-moons are moons orbiting around stars outside of the solar system. They can be created by collisions with other bodies, or formed from a circumplanetary disc, or captured by a planet. Dr. Kipping explained that exo-moons may actually be better candidates as habitable bodies than their host planets. For instance, if a moon were capable of sustain-



Dr. David Kipping

ing an atmosphere and located within the "goldilocks" or habitable zone of a sun, they could be cryo-habitable (liquid ocean beneath), where there may be a chance for life with the presence of water, or they could be telluric — Earthlike and habitable. The difficulty is that alien planets and moons are hard to find. When a moon passes in front of a planet, it causes a dip in the star's brightness, which can be detected using the transit method. In 1989 came the first confirmed exo-planet. In 2000 the first transiting planet was found. As of 2009, the Kepler mission had identified 4,000 candidates for exo-planets. And more recently, Kepler 22-b was the first planet found in the habitable zone (although without a moon). To learn more, visit www.exomoon.org or [Twitter@HEK_Project](https://twitter.com/HEK_Project).

The meeting adjourned at 7:35. Submitted by Tina Huestis, Secretary.

Board of Directors Meeting Minutes — 8/25/14

Attendees: Jim Brenek, Conrad Cardano, Jim Crawford, Ed Haskell, Jim Hendrickson, Bob Horton, Dave Huestis, Tina Huestis, Francine Jackson, Pat Landers, Bobby Napier, Steve Siok, Tom Thibault, and Matt White.

Bob Horton, President: Bob called the meeting to order at 7:00pm at Seagrave.

Bob reminded everyone that the September meeting will be held on Friday, September 5, at the Community Center and will feature Dava Sobel. • Jim Crawford volunteered to handle all of the audio/



Treasurer

Linda Bergemann

Cash Flow YTD as of September 17, 2014
(4/1/14 through 9/17/14)

INFLOWS

AstroAssembly	
Banquet	\$850.00
Registration	\$770.00
TOTAL AstroAssembly	\$1,620.00
Donation	
Misc Donation	\$796.00
Refreshment Donation	\$23.00
TOTAL Donation	\$819.00
Dues	
Contributing	\$10.00
Family	\$120.00
Junior	\$15.00
Regular	\$543.35
Senior	\$247.90
TOTAL Dues	\$936.25
EAGLE Project In	\$170.00
Misc Income	
Interest Inc	\$15.52
Sale of Items	\$500.00
TOTAL Misc Income	\$515.52
Star Party Donations	\$238.00
Subscription Income	
Astronomy	\$34.00
Sky & Telescope	\$32.95
TOTAL Subscription Income	\$66.95
FROM PayPal Account	\$357.46
TOTAL INFLOWS	\$4,723.18

OUTFLOWS

Contingency	
Speakers Fees	\$100.00
TOTAL Contingency	\$100.00
Corporation, State Fee	\$20.00
EAGLE Project Out	\$170.00
Postage and Delivery	\$14.35
Presidential Fund	\$40.00
Printing and Reproduction	\$10.70
Refreshment Expense	\$84.05
Subscription Payments	
Astronomy	\$34.00
Sky & Telescope	\$32.95
TOTAL Subscription Payments	\$66.95
Trustee Expense	
Capital Equipment	\$222.33
Property Maintenance	\$2,488.81
TOTAL Trustee Expense	\$2,711.14
Utilities	
Electric	\$117.12
Porta-John	\$495.00
Propane	\$80.25
TOTAL Utilities	\$692.37
TO Checking	\$357.46
TOTAL OUTFLOWS	\$4,267.02
OVERALL TOTAL	456.16

Cash and Bank Accounts - As of 9/17/14

Capital One Bank	\$12,353.99
Checking	\$12,690.44
PayPal	\$0.00
TOTAL Bank Accounts	\$25,044.43

visual needs and Francine is publicizing the event. • It was agreed that no refreshments will be served due to the uncertainty of the number of attendees. • An email will be sent to the membership recommending them to arrive early since seating is limited. • “International Observe the Moon Night” (IOTMN) is Saturday, September 6. Bob noted that last year the organization participated. • The Board agreed to host a public event this year again at the Observatory, weather permitting. • Volunteers should arrive at 6:00pm for setup and open at 7:00pm. • If weather conditions are in doubt, there should be some members on hand to talk informally about the moon. • Since parking may be congested, car pooling from the Community Center would be helpful. • Francine reported that the IOTMN’s website has a downloadable PowerPoint presentation. • An email will be sent to the membership announcing the IOTMN.

Steve Siok, 2nd Vice President: Steve provided the following update for Astro-Assembly: parking has been arranged, advertisements for the program are being received with more expected, and speakers are committed. • Ray Wolf will present Friday night’s talk. • Saturday poster session topics are being signed up and an email will be distributed to see if there is any interest from the membership. • Jim Crawford noted that a work session will be scheduled the week before the event. Tent/chairs/tables set up is slated for that Thursday. Anyone who wants to help should arrive at the Observatory at 4:00pm. • Steve will be getting the raffle permit in the coming week. • Volunteers are needed for the Saturday lunch-time Grille as well as to manage the free refreshments for that morning.

Dave Huestis, Historian: Dave noted that his guest blog article on the 100th anniversary is now online on the Astronomy website and that a “letter to the editor” will appear in Sky & Telescope. In addition, the next issue of the Amateur Astronomy Magazine and the online site GoLocal.Prov.com will also will carry the story. Dave expects the local newspapers to run something as well as the Sunday Providence Journal, which is planning to print it the week before the event. • He mentioned that the Seagrave relative from Wisconsin in confirmed. • Dave showed a mockup of the postcard that will be given to Astro-

Assembly attendees. He also discussed options and pricing for the anniversary mug.

Tom Thibault, Trustee: Tom brought the group up to speed on work that has been accomplished on the exterior repairs and painting of the Meeting Hall as well as the moving of the bookcases and installations of the cabinets. • He mentioned that there is no update on the Eagle Scout project’s construction documents. Bob volunteered to follow up and reported that he provided a statement to the building planners. • It was noted that the sale of the organization’s two telescopes raised \$500, which was handed over to the Treasurer. • Conrad noted that the Automation Committee finished its work a couple of weeks ago and is now officially dissolved. He plans to finish connectivity instructions/documentation and intends to schedule a hands-on demo for members of the Observatory Committee. • A discussion followed regarding Project Slooh’s outreach to astronomy club memberships. After consideration, the Board decided to pass on the offer.

Francine Jackson: Francine spoke about the “2015 International Year of Light,” which is a United Nation’s global initiative highlighting the importance of light and dark-sky awareness issues. She offered to research it further. • Francine also reported that she met with someone from URI’s conference center who is interested in partnering with Skyscrapers in some manner, for instance holding one of our Skyscraper’s meetings at Alton Jones.

Matt White: Matt noted the following upcoming star parties: Monday, September 15, at 6:30pm at Seagrave; and Friday, October 3, at 7:30pm at Steer Farm Elementary School. • He reported the public observing nights are going well.

Pat Landers: Pat noted that the Friday members’ night was washed out due to poor weather. He is planning the next one to be held on Friday, September 19, and will also schedule another for a Friday evening in October.

Meeting adjourned at 9:00pm.

Submitted by Tina Huestis - Secretary

Skyscrapers September Meeting Minutes - 9/5/2014

First Vice-President Kathy Siok called the Skyscrapers' September meeting to order at 7:15 p.m.

Kathy announced that she & Steve Siok would be conducting the September meeting, filling in for President Bob Horton. After welcoming all present, Kathy indicated that an Astro-Assembly volunteer sign-up sheet was available and she encouraged everyone to put their names down for helping at the annual event. She noted that Treasurer Linda Bergemann was in attendance and to see her to pay for any pre-registrations.

2nd Vice President, Steve Siok: Steve welcomed all first-time attendees to the meeting. • He noted that the Saturday, September 6, open night was called off due to poor weather. Those conditions also cancelled the "International Observe the Moon Night" (IOTMN) program planned for that same evening. The IOTMN event will be rescheduled to a later date. • Steve reminded all present that Skyscrapers' open nights are held at the Observatory on every clear Saturday night, with the exception being those winter months when weather conditions prevent access to the grounds.

Treasurer, Linda Bergemann: Linda reported there were no new members for the month. She noted that the membership application is available online or to see her for a copy. The dues are: \$50 for a Regular membership, \$60 for a Family membership, \$25 for Senior membership, and \$15 for a Junior membership. • Voted into membership at the September meeting was Al Joseph Filocco (of Greenville, RI).

First Vice-President, Kathy Siok: Kathy reported that the next meeting will be Astro-Assembly (September 26– 27). • The Friday, November 7, meeting will be back at the Observatory and will feature Dr. Alan Powers, who will be presenting "NASA Helps Giordano Bruno find New Worlds." • The Saturday, December 13, meeting is the Society's holiday potluck celebration and will be held at the North Smithfield Community Center. Dr. William Waller will present his talk on the "Milky Way." Dr. Waller is a professor at Tufts University. • Kathy reminded all present that the Society's winter meetings will be held off-site at the Community Center. The winter schedule is Saturday, December 13; Saturday, January 10; and Friday, February 6.

Second Vice-President, Steve Siok:



Steve briefed the group on the program for Astro-Assembly. The theme is the "Celebration of the 100th Anniversary of Seagrave Observatory." The Friday night presentation will be by town historian Ray Wolf. • The Saturday program will offer: "show & tell" poster sessions in the Meeting Hall; Dave Huestis presenting the history of Seagrave Observatory; Rich Sanderson speaking about the Springfield Planetarium's star projector; and Andrew Szentgyorgyi talking about the Giant Magellan Telescope's first light instruments. • Owen Gingrich, from the Harvard College Observatory, will be the evening speaker and will provide an overview on the state of astronomy in 1914. • Steve noted that a number of nice raffle prizes will be in store. • The Saturday evening banquet price will be \$25. • Volunteers are still needed for various jobs during the day such as refreshments and parking.

Trustee, Conrad Cardano: Conrad announced that the annual cleanup work ses-

sion is scheduled for Saturday, September 20, to be held rain or shine. • Also an interior work session is scheduled for Saturday, September 6, at 9:00 a.m. for prep work, since the weather won't be suitable for staining. • Steve Siok added that on Thursday, September 25, helpers are needed with tent set up. Plan to arrive between 4:00 – 5:00 p.m.

Announcements for the Good of the Organization: Frank Reed informed the group that he was offering three classes at the Mystic Seaport Museum in Connecticut. They are: "Modern Celestial Navigation (Oct. 18–19)," "Celestial Navigation: 19th Century Methods (Nov. 1–2)," and "Lunars: Finding Longitude by Observing the Moon (Nov. 15–16)." Flyers with more information are available or call Mystic Seaport Reservations (860-572-5322, prompt #1). • Dave Huestis reported Alex Bergemann's Eagle Scout fundraising goal is \$2,250 and encourages members to donate/contribute to help our Society's



youngest member. Checks should be made out to Skyscrapers. The project is an outdoor addition to the Meeting Hall's North side for food/grille set ups. Construction will start once Astro-Assembly is over for this year.

The meeting adjourned at 7:35. Submitted by Tina Huestis, Secretary.

Kathy Siok introduced Dava Sobel au-

thor of Galileo's Daughter, Longitude, and A More Perfect Moon.

Speaker, Dava Sobel presented the talk, "Longitude — A Story of Amateur Triumph." She set the stage by depicting the perils faced by sailors whose longitude reckoning was faulty. Since there was no reliable means to determine longitude at sea, the Royal Observatory offered a 20,000

lbs. sterling prize in 1714 for an answer. To determine longitude, the trick was to know the time of day in two places on the globe at one time. John Harrison (1693–1776) invented a clock that accomplished this feat and didn't need a pendulum nor oiling. Ultimately, Harrison spent 40 years trying to earn the prize.



Twinkle, twinkle, variable star

By Dr. Ethan Siegel

As bright and steady as they appear, the stars in our sky won't shine forever. The steady brilliance of these sources of light is powered by a tumultuous interior, where nuclear processes fuse light elements and isotopes into heavier ones. Because the heavier nuclei up to iron (Fe), have a greater binding energies-per-nucleon, each reaction results in a slight reduction of the star's mass, converting it into energy via Einstein's famous equation relating changes in mass and energy output, $E = mc^2$. Over timescales of tens of thousands of years, that energy migrates to the star's photosphere, where it's emitted out into the

universe as starlight.

There's only a finite amount of fuel in there, and when stars run out, the interior contracts and heats up, often enabling heavier elements to burn at even higher temperatures, and causing sun-like stars to grow into red giants. Even though the cores of both hydrogen-burning and helium-burning stars have consistent, steady energy outputs, our sun's overall brightness varies by just ~0.1%, while red giants can have their brightness's vary by factors of thousands or more over the course of a single year! In fact, the first periodic or pulsating variable star ever discovered—Mira (omi-

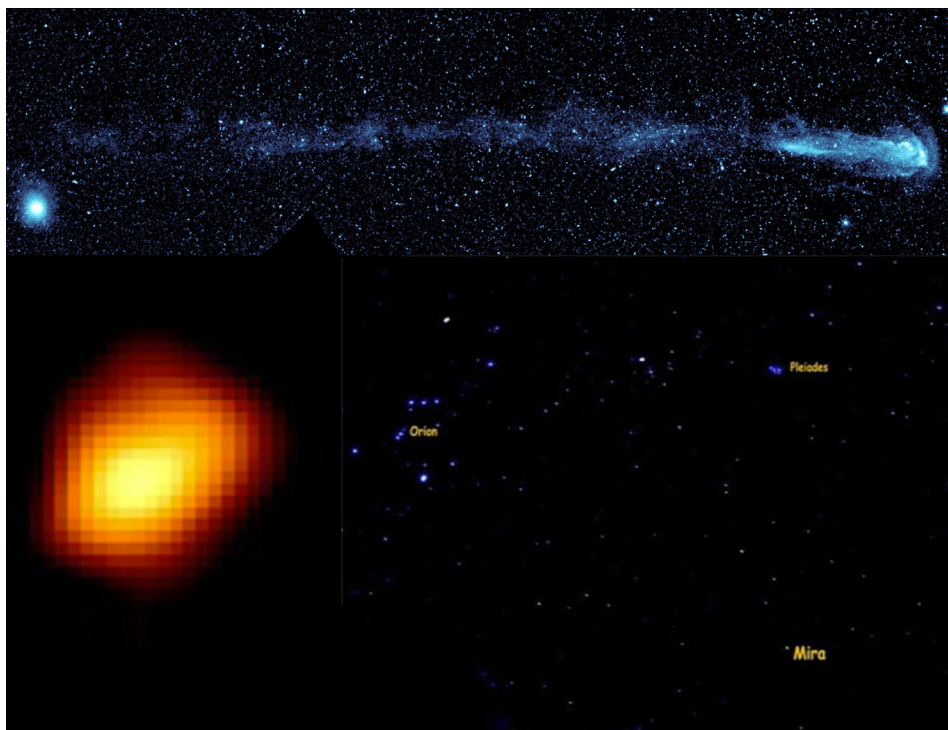
cron Ceti)—behaves exactly in this way.

There are many types of variable stars, including Cepheids, RR Lyrae, cataclysmic variables and more, but it's the Mira-type variables that give us a glimpse into our Sun's likely future. In general, the cores of stars burn through their fuel in a very consistent fashion, but in the case of pulsating variable stars the outer layers of stellar atmospheres vary. Initially heating up and expanding, they overshoot equilibrium, reach a maximum size, cool, then often forming neutral molecules that behave as light-blocking dust, with the dust then falling back to the star, ionizing and starting the whole process over again. This temporarily neutral dust absorbs the visible light from the star and re-emits it, but as infrared radiation, which is invisible to our eyes. In the case of Mira (and many red giants), it's Titanium Monoxide (TiO) that causes it to dim so severely, from a maximum magnitude of +2 or +3 (clearly visible to the naked eye) to a minimum of +9 or +10, requiring a telescope (and an experienced observer) to find!

Visible in the constellation of Cetus during the fall-and-winter from the Northern Hemisphere, Mira is presently at magnitude +7 and headed towards its minimum, but will reach its maximum brightness again in May of next year and every 332 days thereafter. Shockingly, Mira contains a huge, 13 light-year-long tail -- visible only in the UV -- that it leaves as it rockets through the interstellar medium at 130 km/sec! Look for it in your skies all winter long, and contribute your results to the AAVSO (American Association of Variable Star Observers) International Database to help study its long-term behavior!

Check out some cool images and simulated animations of Mira here: http://www.nasa.gov/mission_pages/galex/20070815/v.html

Kids can learn all about Mira at NASA's Space Place: <http://spaceplace.nasa.gov/mira/en/>



Images credit: NASA's Galaxy Evolution Explorer (GALEX) spacecraft, of Mira and its tail in UV light (top); Margarita Karovska (Harvard-Smithsonian CfA) / NASA's Hubble Space Telescope image of Mira, with the distortions revealing the presence of a binary companion (lower left); public domain image of Orion, the Pleiades and Mira (near maximum brightness) by Brocken Inaglory of Wikimedia Commons under CC-BY-SA-3.0 (lower right).

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