the Skyscraper

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February 2017

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

In This Issue:

Saturday, February 4, 7:00pm
at North Scituate Community Center

The Jazz of Physics with Dr. Stephon Alexander

Brown University physics professor Stephon Alexander will cover the ancient quest to understand the motion of celestial bodies and the origin of the cosmos and its connection to music. Of particlar importance is Kepler's musical insight into his three laws. Stephon will discuss the current problems facing cosmology, fine tuning of the constants of nature, and provide a modern musical interpretation that modifies the big bang theory itself.

Stephon Alexander is a professor of physics at Brown University, and focuses on theoretical cosmology, quantum gravity and particle physics. He has studied at Brown University and done postdoctoral research at Imperial College, London and at the Stanford University Linear Accelerator Laboratory.

The research of Dr. Stephon Alexander primarily focuses on understanding t nature of dark energy in the universe, the origin of matter over anti-matter (baryogenesis) in the universe, the origin of large scale structure in the universe from fundamental theory, how space-time singularities, like the initial big-bang singularity are resolved, and how to test a theory of quantum gravity with observations in cosmology.

Alexander also plays jazz saxophone and sees improvisation as an extension of his scholarship.

Observing at Seagrave Observatory will follow the presentation, weather-permitting.

Skyscrapers Board Meetings

Third Monday of the Month
All Members Welcome

Phases of the Moon

First Quarter Moon
February 4 04:19

Full Snow Moon
February 11 00:33

Last Quarter Moon
February 18 19:33

New Moon
February 26 14:58

President's Message

by Steve Siok

Hi Everyone,

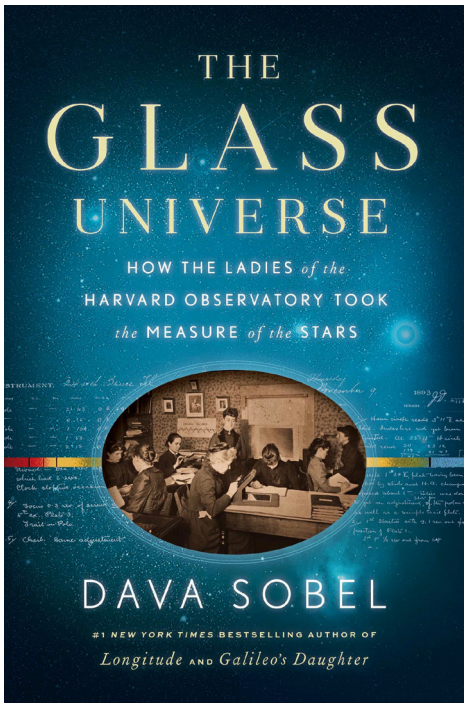
First I want to share an update on the high school student, Josh, that I mentioned last month. He is a student at Portsmouth High School and is working on his senior project. Josh has chosen to construct an 8" Dobsonian telescope. I have signed on as his official mentor, but other members have contributed their time and items to help him as well. Bob Horton has donated an 8" telescope mirror (after he has brought it back to shape with a little polishing). Jim Crawford, who lives only a few miles away in Middletown, has invited Josh to visit and observe at his home Observatory. I have asked Josh to give me a list of pieces he will need to complete his telescope. I will publish this list to our membership and ask you to help by donating any of the parts he needs.

In addition, I look forward to two interesting Skyscraper events this month.

The first will take place on Saturday, February 4th. Skyscrapers will hold the monthly meeting (7 PM) at the North Scituate Community House. Featured will be a new professor in Brown's Physics Department, Dr. Stephon Alexander. He is the author of a book relating Jazz and Physics and an excellent saxaphone player. He will explore the connection between jazz improvisation and modern physics. We hope you will enjoy this unusual talk. Also, if the ground is bare and the skies are clear, Jeff Padell and Bob Horton will open the Observatory for viewing after our meeting. So this should be a fun evening!

The second event of February will take place at Ladd Observatory on Friday, February 10. We are very honored to have author Dava Sobel to speak about her new book "The Glass Universe." The topic is the work done by the women "calculators" at Harvard College Observatory under the direction and with the encouragement of E.C. Pickering. We selected Ladd because it is an historical venue, but there is limited seating. So we are inviting our membership and not advertising to the general public. If you would like to attend, please RSVP to Steve Siok at ssiok@cox.net. Dava's book will not be available at this event, but she will sign your copy if you bring one.

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 **February 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.

Saturday, February 11: Enjoy the Wonders of the World at the University of Rhode Island Planetarium!

University of Rhode Island Planetarium
Kingston Campus
Upper College Road
Saturday, February 11th, 2017, 6:00 P.M.

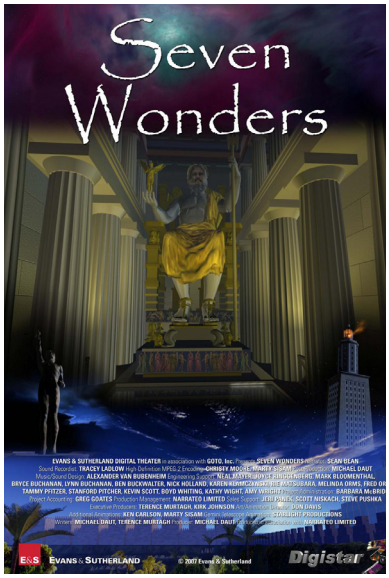
Contact: Francine Jackson 401-527-5558

Come enjoy a tour of the Seven Wonders of the Ancient World! These incredible features were built before modern-day equipment was even a thought, and yet, today, one of these is still a major feature. Why were these made? How? Come learn of the beauty and majesty of the Seven Wonders of the Ancient World. In addition, learn what are considered the Seven Wonders of the Universe, through the beauty of 21st century technology.

In addition to the featured presentation, Losing the Dark, a short introduction to light and its problems in our society will be given, as well as a tour of The Skies above the URI campus.

Admission to this presentation is $5.00, to benefit the URI Planetarium Fund. The URI Planetarium is on Upper College Road, at the end of Engineering Row and across the parking lot from East Hall.

The University of Rhode Island Planetarium is available for programs of many varied topics of astronomical interest. For more information, please call 401-527-5558.



Gene Cernan: Last Man on the Moon

by Francine Jackson

Once again, we mourn one of the exclusive club of men who brought the Apollo program to fruition. Although John Glenn, who died last month, never was a part of the Apollo program, his work on the Gemini mission paved the way for the future astronauts to travel and return safely. This time, however, it is one who went to the Moon, not once, but twice: Eugene Cernan, the last person to step away from the lunar surface.

Cernan, a Navy Ensign commissioned through the Naval Reserve Officers Training Corps at Purdue, became a Naval Aviator, logging over 5,000 hours of flight time.

Cernan was one of the third group of astronauts chosen in 1963, exclusively for the Gemini and Apollo programs. His first launch was the Gemini 9A, after the untimely deaths of original Gemini 9 crew members Eliot See and Charles Bassett. The work of Gemini 9A resulted in the docking successes of the Apollo craft.

Cernan's first taste of the Moon came as a result of Apollo 10, where he explored the possible landing site for Armstrong and Aldrin just several weeks before Apollo 11 was to set down. It is said that Apollo 10 set the record for the highest speed ever by a manned vehicle: 24,791 mph, during the mission's return flight home.

Cernan and fellow Apollo 17 astronaut Schmitt spent about 22 hours on the Taurus-Littrow valley, including several miles traveling on the lunar rover. On their final return to the lunar module, it is said that Cernan drew his daughter's initials on the surface with his boot, then stated:

"…This is Gene, and I'm on the surface, and as I take man's last step from the surface, back home for some time to come – but we believe not too long into the future – I'd like to just (say) what I believe history will record: That America's challenge of today had forged man's destiny of tomorrow. And, as we leave the Moon at Taurus-Littrow, we leave as we came and, God willing, as we shall return, with peace and hope for all mankind. Godspeed the crew of Apollo 11."

As we stated just last month with another veteran astronaut: Godspeed, Gene Cernan.

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

Orion Nebula by Jim Crawford

Starry Nights of February

by Dave Huestis

Winter can be a challenge to amateur astronomers in southern New England. The weather can be very snowy, or the temperatures can be so low that even I need some special incentive to venture outdoors to observe. However, if Mother Nature can provide us with a happy medium between these two scenarios, there are several astronomical highlights you should try to explore during February.

You've no doubt noticed that bright beacon Venus in the southwestern sky after sunset. Have you also noticed a reddish star-like object to Venus' upper left? That's not a star. It's the planet Mars. In one quick glance you can observe our two neighbors. And on January 31 a waxing crescent Moon joins this planetary pairing to form a beautiful triangle. Capture this sky scene with a camera and share your experience with family and friends.

Venus goes through phases similar to that of the Moon, so if you have a telescope you can observe Venus as she starts the month out in a waxing crescent phase and at a distance of about 49,600,000 miles. Watch as the illuminated phase decreases throughout the month. Venus will also increase in apparent size as the planet moves closer to the Earth, being about 33,000,000 miles away by month's end.

And while you could also focus in on Mars with a telescope, little if no detail would be discernible since on February 1 this desert world will be just over 172,500,000 miles away. By the 28th that distance will have increased to a little more than 189,000,000 miles. I would suggest waiting until a few months before or after July 31, 2018, when Mars will be next closest to the Earth at around 35,800,000 miles. You'll observe much surface detail during this time of close approach.

On February 10 we will be well positioned to observe a lunar eclipse. Unfortunately this event will only be a penumbral eclipse with the Moon sliding through the Earth's lighter shadow. With no media coverage I doubt whether anyone would notice the phenomenon at all.

However, if you follow the progression of the eclipse you should notice that the top portion of the Moon will look dusky because it will be deep within the penumbral shadow, just missing the dark umbral shadow. The eclipse begins at 5:34 p.m., with maximum eclipse at 7:44 p.m. The

eclipse ends at 9:53 p.m. All times are EST (Eastern Standard Time). Check out these animations:

http://shadowandsubstance.com/20170210penumbral/20170210penumbraC.mp4

https://www.timeanddate.com/eclipse/lunar/2017-february-11

In addition, on February 25, 26 and 27, a telescope with a low power eyepiece will reveal Uranus, seventh planet from the Sun, located about one Full Moon diameter away from Mars in the western sky after sunset. Uranus' planetary disk will look like a tiny blue-green marble. The contrast with reddish Mars will be quite distinct.

The winter sky contains the brightest stars we can see from the Earth. And two of my favorite objects to observe can be found among them. First up is the Pleiades open star cluster. It's easy to identify with the naked-eye in the constellation Taurus. It is also known as the Seven Sisters in Greek mythology. And some of you may recognize it as the logo for the car brand Subaru. Casual stargazers often think it is the "little dipper" (Ursa Minor).

The Pleiades stars formed about one hundred million years ago from a common dust cloud, most likely similar in appearance to the Orion Nebula today. The cluster is about 440 light years away. Long photographic exposures show some dust surrounding the cluster, originally thought to be remnants of the original stellar nursery from which it formed. However, it is now believed to be a dust cloud through which the Pleiades stars are passing.

In a really dark sky with a large telescope an observer can glimpse this nebulosity. While binoculars do show a nice image, the ideal sight you want to achieve is with a telescope under low magnification so the entire cluster fits into the field of view. The Pleiades remind me of sparkling diamonds scattered upon black velvet.

My second favorite object resides in the neighboring constellation of Orion. Locate the three stars that represent his belt. Beneath the belt is a curved stream of stars that can be seen in a dark sky. This group of stars represents Orion's sword. A pair of binoculars will reveal a fuzzy patch of light where the middle "star" is located. Any low magnification telescope will reveal its true nature—the Orion Nebula—another vast star-forming region in our Milky Way Galaxy.


Pleiades Cluster by Tom Thibault

With the eye one can see vast green-tinted wispy tendrils of the nebula that stretch out from the center, which is about 1,350 light years away and some 30 light years across. Long-duration images show the nebula to be pink and blue. In the future many more stars will be born here. In fact, research shows there are approximately 700 stars embedded within the dust cloud, ready to emerge. For now there are four primary stars only one million years-old, called the Trapezium, in the central region of the nebula. One day this region will be ablaze with new stars.

The Pleiades and the Orion Nebula are incredibly beautiful stellar birth places that can lure me out into a crystal clear and cold winter night.

So don't hibernate like a bear. When Ursa Major and Ursa Minor put in an appearance in the northern sky, you can then step outside of your cozy den to observe the many interesting astronomical objects awaiting your attention. And be sure to visit the local observatories for some great views of the heavens.

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://www.frostydrew.org/) in Charlestown is open every clear Friday night year-round.

Great American Total Solar Eclipse on August 21, 2017. Countdown: 200 days as of February 1, 2017.

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

Double Star in Canis Major

h3945

by Glenn Chaple for LVAS

Mags. 5.0 + 5.8; Sep. 26.4"; P.A. 52o (2008)

What is the most colorful double star in the night sky? Most amateur astronomers would vote for Albireo (beta [β] Cygni. Others might cite gamma (γ) Andromedae, iota (ι) Cancri, xi (ξ) Bootis, or eta (η) Cassiopeiae. Sadly overlooked is a double star that might challenge them all – h 3945 in Canis Major. It is arguably the most colorful double star in the winter sky and, in fact, has been nick-named the "Winter Albireo."

h3945 (aka 145 Canis Majoris) is one of more than 5500 double stars catalogued by John Herschel (William's son) in the early 1800s. The magnitude 5.0 primary is accompanied by a 5.8 magnitude companion 26.4 arc-seconds away. Their spectral types (K3 and F0) give rise to a stunning color contrast. In her book Double Stars for Small Telescopes, Sissy Haas writes, "Showcase pair: A bright, wide, and easy pair with deep colors. The stars are bright citrus orange and royal blue; these colors are seen vividly and in strong contrast." In early 2008, 3945 was the subject of a forum on the Cloudynights website. The general consensus was that this is one of the most beautiful double stars in the night sky. That was my thought when I included h3945 in a "Top 100 Doubles" series written for Deep Sky Magazine in 1983.

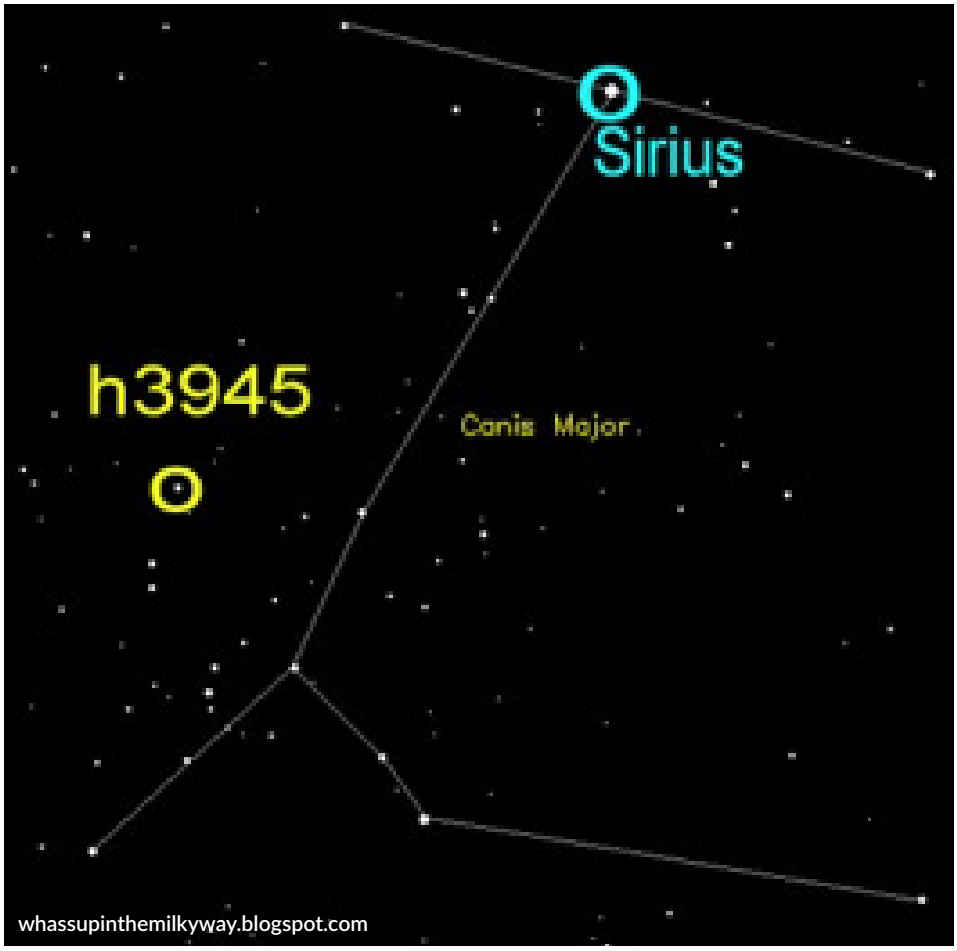
Despite these kudos, h3945 still gets the cold shoulder from most backyard astronomers. In the February, 1980, issue of Deep Sky, I described h3945 as "one of the most colorful, yet underrated, double stars in the heavens." Richard Dibon-Smith, on his Constellation Web Page (www.dibon-smith.com) concurs, noting that, "h3945 is a gorgeous yet rather unknown binary." In the Cambridge Double Star Atlas, co-author James Mullaney laments that h3945 is "Largely unknown & unobserved – a pity!"

Why would such a beautiful double star be so grossly ignored? There are two parts to the answer - h3945 is in a southerly location, and it isn't as bright and easily located as Albireo or Almach. The first isn't a problem if your observing site affords a clear view of the lower half of Canis Major. Because h3945 is marginally visible to the naked eye from mildly light-polluted suburban skies, the accompanying finder chart will help you find it.

Sissy Haas, Richard Dibon-Smith, James Mullaney, your truly, plus a batch of backyard astronomers on the Cloudynights website have all raved about h3945. Now it's your turn to experience one of the night sky's true gems.

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.

Glenn Chaple



Comet Campaign: Amateurs Wanted

By Marcus Woo

In a cosmic coincidence, three comets will soon be approaching Earth—and astronomers want you to help study them. This global campaign, which will begin at the end of January when the first comet is bright enough, will enlist amateur astronomers to help researchers continuously monitor how the comets change over time and, ultimately, learn what these ancient ice chunks reveal about the origins of the solar system.

Over the last few years, spacecraft like NASA's Deep Impact/EPOXI or ESA's Rosetta (of which NASA played a part) discovered that comets are more dynamic than anyone realized. The missions found that dust and gas burst from a comet's nucleus every few days or weeks—fleeting phenomena that would have gone unnoticed if it weren't for the constant and nearby observations. But space missions are expensive, so for three upcoming cometary visits, researchers are instead recruiting the combined efforts of telescopes from around the world.

"This is a way that we hope can get the same sorts of observations: by harnessing the power of the masses from various amateurs," says Matthew Knight, an astronomer at the University of Maryland.

By observing the gas and dust in the coma (the comet's atmosphere of gas and dust), and tracking outbursts, amateurs will help professional researchers measure the properties of the comet's nucleus, such as its composition, rotation speed, and how well it holds together.

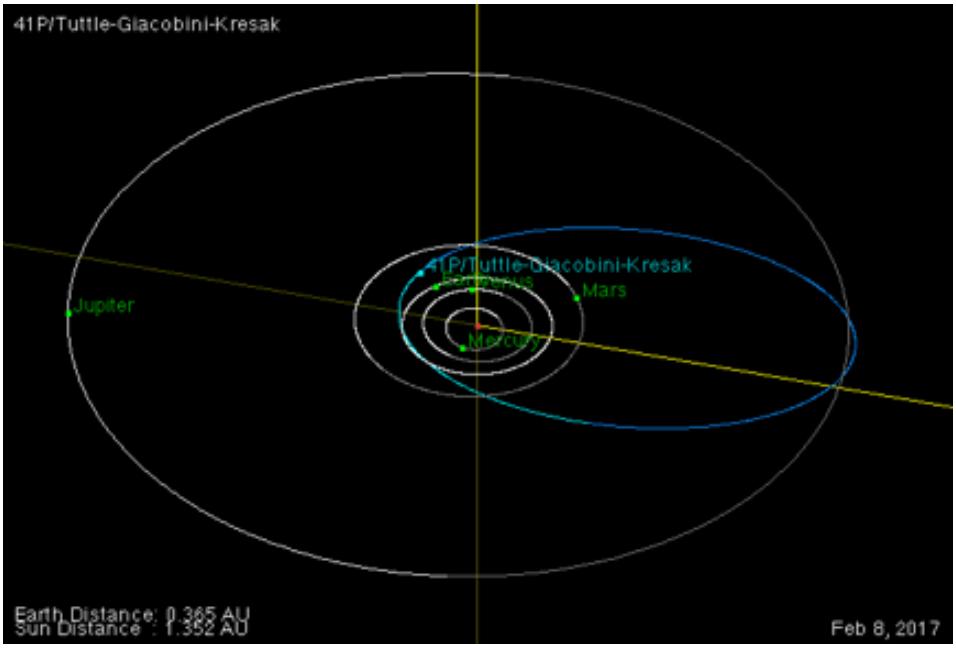
The observations may also help NASA scout out future destinations. The three targets are so-called Jupiter family comets, with relatively short periods just over five years—and orbits that are accessible to spacecraft. "The better understood a comet is," Knight says, "the better NASA can plan for a mission and figure out what the environment is going to be like, and what specifications the spacecraft will need to ensure that it will be successful."

The first comet to arrive is 41P/Tuttle-Giacobini-Kresak, whose prime window runs from the end of January to the end of July. Comet 45P/Honda-Mrkos-Pajdusakova will be most visible between mid-February and mid-March. The third target, comet 46P/Wirtanen won't arrive until 2018.

Still, the opportunity to observe three relatively bright comets within roughly 18 months is rare. "We're talking 20 or more years since we've had anything remotely resembling this," Knight says. "Telescope technology and our knowledge of comets are just totally different now than the last time any of these were good for observing."

For more information about how to participate in the campaign, visit http://www.psi.edu/41P45P46P.

Want to teach kids about the anatomy of a comet? Go to the NASA Space Place and use Comet on a Stick activity! http://spaceplace.nasa.gov/comet-stick/



An orbit diagram of comet 41P/Tuttle-Giacobini-Kresak on February 8, 2017—a day that falls during the comet's prime visibility window. The planets orbits are white curves and the comet's orbit is a blue curve. The brighter lines indicate the portion of the orbit that is above the ecliptic plane defined by Earth's orbital plane and the darker portions are below the ecliptic plane. This image was created with the Orbit Viewer applet, provided by the Osamu Ajiki (AstroArts) and modified by Ron Baalke (Solar System Dynamics group, JPL). http://ssd.jpl.nasa.gov/sbdb.cgi?orb=1;sstr=41P

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!

A note on the passing of comet discoverer Klim Churyumov

by Francine Jackson

I was very privileged, at a recent conference in Warsaw, to hear Klim Churyumov speak on his life and his thrill that "his" comet, 67P/Churyumov-Gerasimenko, was chosen to be, not only the focus of the ESA Rosetta mission, but the target of the companion lander Philae.

Born in 1937, Churyumov at a young age knew he wanted to study physics, and, under the tutelage of Sergei Vsekhsvyatsi, researched comets, resulting in the discovery of 67P in 1969, and Comet Churyumov-Solodovnikov (C/N1) in 1986. In addition, he was named director of the Kiev Planetarium in 2004.

Churyumov authored close to 1,000 scientific papers and several textbooks, in addition to many children's books. He was a member of the National Academy of Sciences of Ukraine, the New York Academy of Sciences, and many other professional organizations. His death on October 14th, 2016, leaves a great void in the astronomical community.

January Reports

Skyscraper Board of Directors meeting. January 16, 2017

In attendance: Steve Hubbard, Connie and Kent Cameron, The ruling Diarchy of Kathy and Steve Siok, Francine Jackson, Lloyd Merrill, Jim Hendrickson, Linda Bergemann, Tracy Prell, Jim Crawford and Bob Horton.

7:04pm: Tracy Prell provided the prelude to the meeting with customary ceremonial clicking of the camera. Following this, Tracy passed out some custom made cookies that she had someone create to all in attendance. One design had the society logo, the other was a representation of the award winning refractors made by Al Hall and Dick Parker.

Meeting called to order at 7:08pm by the male half of our Diarchy, Steve Siok:

Francine asked if our February 4 speaker, Stephon Alexander will bring any of his books to sell for his talk to us: "The Jazz of Physics." Bob Horton agreed to provide the speaker's email so that Francine could find out.

Special meeting / talk February 10: Author Dava Sobel has agreed to give a talk. This will be held at Ladd Observatory and will be about the new book that she has just had published, "Glass Universe." This will be a limited space available presentation due to space limitations. President Siok will be providing further details in the next issue of "The Skyscraper" in the Presidential Announcements section.

Visit by friend of Tracy Prell: Tracy has a friend from Kosovo, Pranbera Hyseni. Pranbera runs "Astronomy Outreach of Kosovo." Pranbera will be making a presentation at this year's Texas Star Party in June. It was suggested that Tracy see if she can get Pranberra to make a stop by in our area on her way back and perhaps give us a presentation too. Tracy will be working on this.

Astroassembly 2017: Due to Yom Kippur being on the last weekend in September and Columbus day along with the Scituate Art Festival being the week after, it was decided that we would shift the usual date for this to the weekend of October 13 and 14. A number of ideas were tossed around to try and figure out a theme for this year's event, nothing was settled on during this meeting.

Treasurer's Report: Lloyd announced that our finances were in good shape, he needs to get out some thank you letters for donations given us.

Trustees Report: Jim Crawford started this off by berating President Siok for 4 typos in his recent Presidential Announcement. Once this was out of his system, Jim let us know that all planned upgrades for the 12 and 16 inch scopes have been done. To include dovetails, focusers and so forth. We now have phone adapters available for anyone who would like to take a picture of what they saw in the telescope.

There was discussion of controlling the telescopes remotely from the meeting hall. Jim has done this at his home with a piece of software called "Team Viewer." Further testing of this will be done and hopefully we'll be able to do this soon since we now have wireless internet on site.

There is a free listing available in the Blackstone Valley visitor guide. It was decided to put in a notice about Skyscrapers in there.

Nominating Committee: Steve Siok announced that we have 2 willing subjects who have agreed to take on the thankless task of groveling for members who would run for offices. These are: Jim Crawford and Bob Horton. After appropriate condolences were made to both individuals, President Siok let us know that this will be announced in the February issue of "The Skyscraper."

Yet more discussion on suggested donations: It was proposed that we have the following suggested donation for groups requesting special observing events:

Non Profits visiting Seagrave Observatory: $2pp / Maximum of 35 people

Non Profits off site: $2pp / $100 minimum.

For any large organizations that charge an admission fee to their events and ask us to provide telescopes in conjunction with that, we would ask that they contact us so that we can evaluate their needs and what we would ask. Further policy on this part to be developed.

Library Telescopes: Further discussion on this too. Francine wrote an article for the newsletter for the "Coalition of Library Advocates" COLA. We are trying to gauge interest in this before going any further and we need to develop a policy and some procedures for this program. Depending upon the level of interest, we would work with the resources provided to us during the prior board meeting by John Root.

Spring Workshops: Preliminary discussions started. Kathy Siok willing to do a basic workshop about things like the phases of the Moon, seasons and so forth. April was suggested as a possible time to start these.

Members Night?: Bob Horton would like to organize a member's night in the spring. Probably in May. Still tentative, Bob will be talking more on this. Jim Crawford thought that a member's night has already been scheduled for April 29.

At about 9pm, extreme fatigue and disinterest set in. We closed out the meeting and along with Elvis, left the building.

Submitted by your humble society secretary, Steve Hubbard

The Sun, Moon & Planets in February

This table contains the ephemeris of the objects in the Solar System for each Saturday night in February 2017. All times are in Eastern Standard (UTC -5) for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
Sun	**4**	21 11.3	-16 13.8	Cap	-26.8	1946.9	-	-	-	0.99	06:55	12:00	17:06
	11	21 39.2	-14 01.8	Cap	-26.8	1944.6	-	-	-	0.99	06:46	12:00	17:15
	18	22 06.5	-11 38.5	Aqr	-26.8	1941.9	-	-	-	0.99	06:37	12:00	17:23
	25	22 33.3	-9 06.1	Aqr	-26.8	1938.8	-	-	-	0.99	06:26	11:59	17:32
Moon	**4**	2 47.2	10 30.8	Ari	-11.9	1962.7	88° E	48	-	-	11:23	18:28	01:40
	11	9 39.6	12 33.9	Leo	-12.7	1913.2	179° E	100	-	-	18:10	00:59	07:39
	18	15 19.7	-13 22.8	Lib	-11.9	1755.2	99° W	58	-	-	00:11	05:31	10:46
	25	21 11.6	-14 55.2	Cap	-8.8	1845.5	20° W	3	-	-	05:50	11:13	16:41
Mercury	**4**	19 48.7	-21 58.1	Sgr	-0.1	5.4	20° W	84	0.46	1.24	05:59	10:39	15:18
	11	20 32.7	-20 24.9	Cap	-0.2	5.2	17° W	89	0.47	1.31	06:09	10:55	15:42
	18	21 18.3	-17 47.1	Cap	-0.4	5.0	13° W	93	0.45	1.35	06:15	11:13	16:12
	25	22 04.9	-14 03.3	Aqr	-0.8	4.9	9° W	97	0.43	1.38	06:19	11:33	16:47
Venus	**4**	23 57.5	2 07.4	Psc	-4.4	32.6	45° E	38	0.72	0.52	08:34	14:45	20:57
	11	0 14.3	5 07.9	Psc	-4.4	36.0	43° E	32	0.72	0.47	08:12	14:34	20:56
	18	0 27.3	7 48.8	Psc	-4.5	40.1	40° E	27	0.72	0.42	07:47	14:19	20:51
	25	0 35.4	10 00.8	Psc	-4.4	44.7	36° E	21	0.72	0.38	07:19	13:59	20:38
Mars	**4**	0 19.0	1 42.1	Psc	1.1	5.0	50° E	93	1.44	1.87	08:57	15:06	21:16
	11	0 38.0	3 50.7	Psc	1.2	4.9	48° E	93	1.45	1.92	08:41	14:58	21:16
	18	0 56.9	5 56.8	Psc	1.2	4.8	46° E	94	1.46	1.96	08:24	14:49	21:14
	25	1 15.9	7 59.4	Psc	1.3	4.7	44° E	94	1.47	2.01	08:08	14:41	21:13
1 Ceres	**4**	1 58.2	6 25.2	Psc	8.9	0.4	74° E	97	2.80	2.90	10:18	16:44	23:10
	11	2 05.2	7 27.6	Psc	9.0	0.4	69° E	97	2.80	2.99	09:54	16:23	22:53
	18	2 12.8	8 30.7	Cet	9.0	0.4	64° E	97	2.79	3.07	09:30	16:04	22:37
	25	2 20.9	9 34.1	Cet	9.0	0.4	60° E	98	2.79	3.15	09:07	15:44	22:22
Jupiter	**4**	13 27.7	-7 40.3	Vir	-2.0	39.3	112° W	99	5.46	5.01	22:40	04:15	09:49
	11	13 27.7	-7 38.1	Vir	-2.1	40.1	119° W	99	5.46	4.09	22:13	03:47	09:22
	18	13 27.0	-7 32.5	Vir	-2.1	40.9	127° W	99	5.46	4.81	21:44	03:19	08:54
	25	13 25.8	-7 23.7	Vir	-2.2	41.7	134° W	100	5.46	4.72	21:15	02:50	08:26
Saturn	**4**	17 37.9	-22 03.0	Oph	0.6	15.6	50° W	100	10.05	10.65	03:47	08:24	13:02
	11	17 40.5	-22 04.0	Oph	0.6	15.7	57° W	100	10.05	10.55	03:22	07:59	12:37
	18	17 42.8	-22 04.8	Oph	0.5	15.8	64° W	100	10.05	10.45	02:57	07:34	12:12
	25	17 44.8	-22 05.2	Sgr	0.5	16.0	70° W	100	10.05	10.35	02:31	07:09	11:46
Uranus	**4**	1 19.0	7 42.0	Psc	5.9	3.5	66° E	100	19.94	20.32	09:34	16:04	22:34
	11	1 19.8	7 47.4	Psc	5.9	3.5	59° E	100	19.94	20.43	09:07	15:37	22:08
	18	1 20.8	7 53.5	Psc	5.9	3.4	52° E	100	19.94	20.53	08:40	15:11	21:42
	25	1 21.9	8 00.2	Psc	5.9	3.4	45° E	100	19.93	20.62	08:13	14:44	21:16
Neptune	**4**	22 50.2	-8 19.3	Aqr	8.0	2.2	25° E	100	29.95	30.84	08:04	13:36	19:08
	11	22 51.1	-8 13.6	Aqr	8.0	2.2	19° E	100	29.95	30.88	07:37	13:09	18:42
	18	22 52.1	-8 07.8	Aqr	8.0	2.2	12° E	100	29.95	30.92	07:10	12:43	18:15
	25	22 53.1	-8 01.8	Aqr	8.0	2.2	5° E	100	29.95	30.94	06:43	12:16	17:49
Pluto	**4**	19 17.8	-21 15.4	Sgr	14.3	0.2	27° W	100	33.27	34.14	05:23	10:04	14:45
	11	19 18.7	-21 14.2	Sgr	14.3	0.2	34° W	100	33.27	34.08	04:56	09:37	14:18
	18	19 19.6	-21 13.2	Sgr	14.3	0.2	41° W	100	33.27	34.01	04:29	09:11	13:52
	25	19 20.3	-21 12.2	Sgr	14.3	0.2	48° W	100	33.28	33.93	04:02	08:44	13:25

The winter sky including Orion, Lepus, Columba, Canis Major, Canis Minor & Monoceros by Jim Hendrickson.

Steve Hubbard captured these winter deep sky objects with a Mallincam on a 14" SCT: Central Orion Nebula, NGC 2392 Eskimo Nebula in Gemini, NGC 2022 small planetary in Orion, NGC 2261 Hubble's Variable nebula in Monoceros.

The waxing crescent Moon with Earthshine, taken on January 30 by Jim Hendrickson.

Directions to Seagrave Memorial Observatory

www.theSkyscrapers.org

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.

SKYSCRAPERS INC.

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