



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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Saturday, March 9, 6:00pm at North Scituate Community House

Programs of the Astronomical League by Jeff Padell

This past summer the Skyscrapers joined the Astronomical League. We have about 15 members who joined the League. Jeff Padell, who is our ALCor (Astronomical League Correspondent), will be telling us about the AL and what they offer. Besides a magazine and information they offer awards programs covering all aspects of amateur astronomy from the very basic for beginners to in-depth programs such as Radio Astronomy that actually helps the professionals. Jeff has earned the

Hydrogen Alpha Award and pin, a difficult award to earn especially with the current solar minimum, only 44 people in the AL have qualified for this award. More importantly and a challenge Jeff is throwing out to the entire membership of the Skyscrapers is the Outreach Award! Jeff earned it this past year. The Outreach Award is to recognize your helping with Public Nights, Star Parties and other astronomy related activities. Jeff would like our entire membership to qualify for this award.



Phases of the Moon

- New Moon**
March 6 16:04
- First Quarter Moon**
March 14 10:27
- Full Worm Moon**
March 21 01:43
- Last Quarter Moon**
March 28 04:10



Seagrave Memorial Observatory Open Nights

Saturdays at 8:00 pm
weather & conditions permitting

President's Message

by Steve Hubbard

Welcome to spring! (Almost). As I write this, there is still snow on the ground and it's cold out. When I have been able to get out and peek at the night sky, I can see the Constellation of Leo starting to rise above the horizon along with Ursa Major. Both of these constellations herald the arrival of spring, better weather and hopefully more observing.

Spring is the time of the galaxies. Constellations such as Leo, Virgo, Ursa Major, Lynx and others are just stuffed full of galaxies for us to see, many of them quite bright and easy to find.

Now that we are starting to break the grip of winter, we can start to look forward and do some planning for the rest of the

year.

In 2019, it is my goal to set up some member observing events once again, starting in April. By popular demand, we will try these out on Friday nights and see how things go. Along with this, I hope that you can make our March meeting. Long time member Jeff Padell will be giving us a presentation about the observing programs available from the Astronomical League. These should tie in nicely with our efforts at doing some more member observing events.

I hope you all can make to this meeting, it promises to be informative and helpful. Watch your emails and this publication for more updates about future group observing opportunities.



Waxing gibbous Moon from Ladd Observatory on 2/14 by Jim Hendrickson

Skyscrapers Food Basket

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

amazonsmile
You shop. Amazon gives.

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

Skyscrapers Library Borrowing Procedure

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

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

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

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



The *Skyscraper* is published monthly by Skyscrapers, Inc. Meetings are held monthly, usually on the first or second Friday or Saturday of the month. Seagrave Memorial Observatory is open every Saturday night, weather permitting.

Directions

Directions to Seagrave Memorial Observatory are located on the back page of this newsletter.

Submissions

Submissions to The Skyscraper are always welcome. Please submit items for the newsletter no later than **March 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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Image by Bob Horton

Orion the Hunter

by Dave Huestis

As the month of March begins, those of you who are early risers will notice a beautiful sight in the eastern sky before dawn. On the 1st brilliant Venus will be about ten degrees above the horizon. About 15 degrees to the upper right of Venus you'll see Saturn, and two and a half degrees to the upper right of Saturn be a very thin waning crescent Moon. Twenty degrees farther in the same direction you'll find bright Jupiter. These astronomical bodies appear along this linear arc because it is the ecliptic (the path of the Sun though our sky and the plane of the solar system). This stunning sky scene will be an excellent photo oppor-

tunity, so I encourage anyone to capture it.

Everyone with an interest in astronomy probably has a favorite constellation. It may be because of the star pattern's mythology, its shape in the sky, or for the beautiful objects that reside within its boundaries.

While the months of March, April and May are meteorologically spring months, an astronomer can still observe many of the sky's prominent winter constellations early in the season. What's more is that the temperatures outside may be more moderate.

One of my favorite constellations is the most prominent star pattern in the winter sky—Orion, the mighty hunter. However,

on March 1 this large constellation, 26th in size, can easily be found about halfway above the southern horizon after sunset. (See accompanying star map.) Though Orion rises on his side, only when he is due south of our location is he standing upright. With the exception of Ursa Major (the Big Dipper) and Scorpius (the scorpion), Orion is probably the most recognizable of star patterns. He is also the brightest of all the 88 constellations.

The mythology of Orion, like many of the older northern hemisphere constellations that date back to the early Greeks and Romans, is quite extensive. The myth I like the most can easily be visualized in the vault of the heavens. Orion fell in love with Pleione, one of the seven sisters known as the Pleiades. To protect the sisters from Orion's amorous pursuit Zeus placed them in the sky. Though Orion also attained a position in the sky, Zeus positioned Taurus the bull in the sky between Orion and the Pleiades to further thwart his advances. Taurus is recognized by the V-shaped asterism known as the Hyades, with the red giant star Aldebaran marking the bull's eye. One can easily observe this confrontation to this day as Orion continues to pursue the Pleiades across the sky while fending off the bull.

Before we explore one of the most beautiful celestial objects visible to amateur telescopes (and the determining factor for Orion being one of my favorite constellations), let's examine some of the major stars that comprise this sky pictogram.

The prominent red star Betelgeuse marks Orion's eastern shoulder (top left, from our perspective) and Bellatrix marks the western one (top right). Betelgeuse, which means "the armpit of the central one," is a very large red giant star at a distance of 520 light years, measuring in at a conservative 950 solar diameters. It coincidentally resides in a "giant" of a constellation. If you replaced our Sun with Betelgeuse it would extend out to the asteroid belt between Mars and Jupiter.

Blue-white supergiant Rigel resides 800 light years away and is positioned at Orion's western heel (bottom right), while Saiph is at the eastern one (bottom left). Rigel, in Arabic, means "the left leg of the giant." West of Bellatrix is a curved group of eight stars that represents Orion's shield. Contained within the rectangle formed by Betelgeuse, Bellatrix, Rigel and Saiph is a string of three stars that comprises Orion's belt. Just below the belt you'll find Orion's

sword, made up of a small group of stars.

The grandeur of Orion resides in the region of his sword. Using binoculars you'll see a wispy, hazy patch of green light enshrouding the stars. Using a telescope even under low magnification will reveal a greenish tinged nebula of dust and gas, the magnificent Orion Nebula (see photo insert).

You'll be amazed at the intricate swirls of nebulosity, especially on a moon-less night in a dark country sky. This nebula complex lies about 1,400-1,500 light years distant and is about 30 light years across. You'll also immediately notice four bright stars embedded in the nebulosity. This asterism is called the Trapezium. These four stars are "youngsters" in the universe—only about one million years old. They formed out of some of the gas and dust in the nebula. Approximately 1,000 other stars share a space of about four light years in diameter with the Trapezium stars. That's crowded real estate!! And more suns will coalesce out of this stellar nursery in the future.

No one has described the humbling effect the Orion Nebula has on us amateur astronomers any better than Garrett P. Serviss in his 1901 book "Pleasures of the Telescope."

"Nowhere else in the heavens is the architecture of a nebula so clearly displayed. The work of creation is proceeding within its precincts. There are stars apparently completed, shining like gems just dropped from the hand of the polisher, and around them are masses, eddies, currents, and swirls of nebulous matter yet to be condensed, compacted, and constructed into suns. It is an education in the nebular theo-

ry of the universe merely to look at this spot with a good telescope. If we do not gaze at it long and wistfully, and return to it many times with unflinching interest, we may be certain that there is not the making of an astronomer in us."

Did you or one of your family members receive a telescope for Christmas? If bad weather and cold temperatures kept you from observing during January and February, I would suggest that the Orion Nebula be your first celestial target during early March before Orion disappears from view

in evening twilight. Then you can decide for yourself whether or not Serviss' description still does justice to the magnificence of this nebula today.

The Orion Nebula looks absolutely wonderful with some of the larger instruments at the local observatories. Don't forget that March is a transitional month from winter into spring, and here in Southern New England we can experience a wide range of weather. Be sure to check the respective websites for any cancellation notices and observing schedules before venturing out for a visit. Seagrave Memorial Observatory (<http://www.theskyscrapers.org>) in North Scituate is open every clear Saturday night. Ladd Observatory (<http://www.brown.edu/Departments/Physics/Ladd/>) in Providence is open every clear Tuesday night. The Margaret M. Jacoby Observatory at the CCRI Knight Campus in Warwick (<http://www.ccri.edu/physics/observatory.htm>) is open every clear Thursday night. Frosty Drew Observatory (<http://www.frostydrew.org/>) in Charlestown is open every clear Friday night.

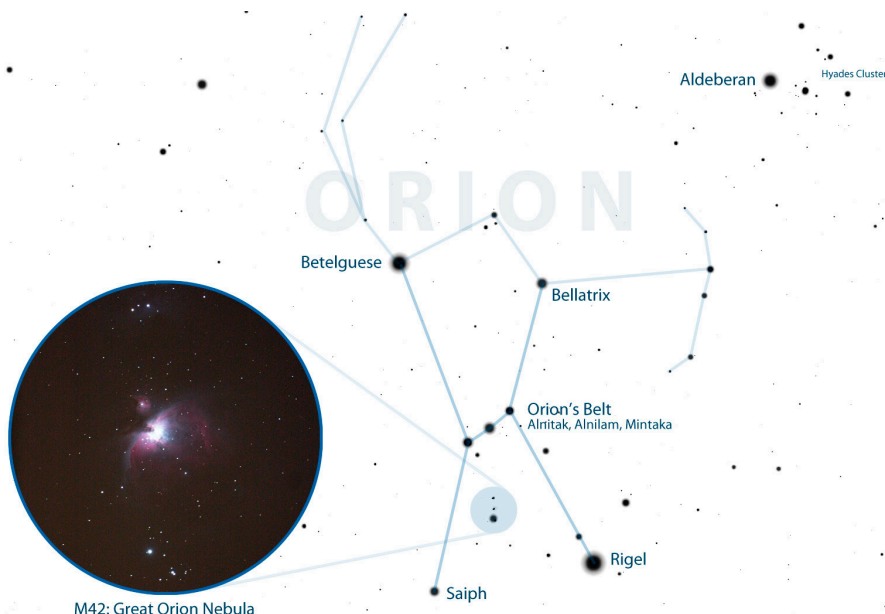
As always, keep your eyes to the skies.



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>



The Great Orion Nebula. Image by Bob Horton



M42: Great Orion Nebula

A Farewell to Mars Rover Opportunity

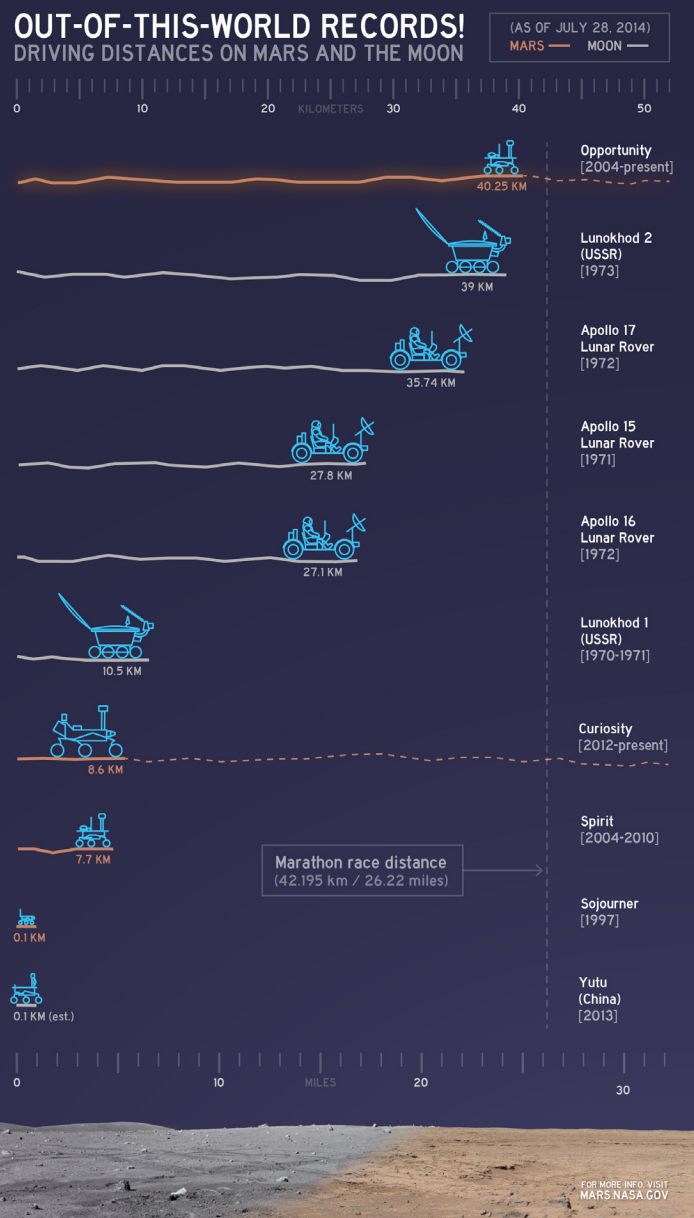
by Francine Jackson

By now, we are all aware of the sad ending of one of the best workhorse space craft NASA ever had: Opportunity. With its sister craft, Spirit, the two were meant to travel around our neighbor planet Mars for a few months, determining whatever it could about the possibility of water early in the planet's history. Both were wildly successful in this quest.

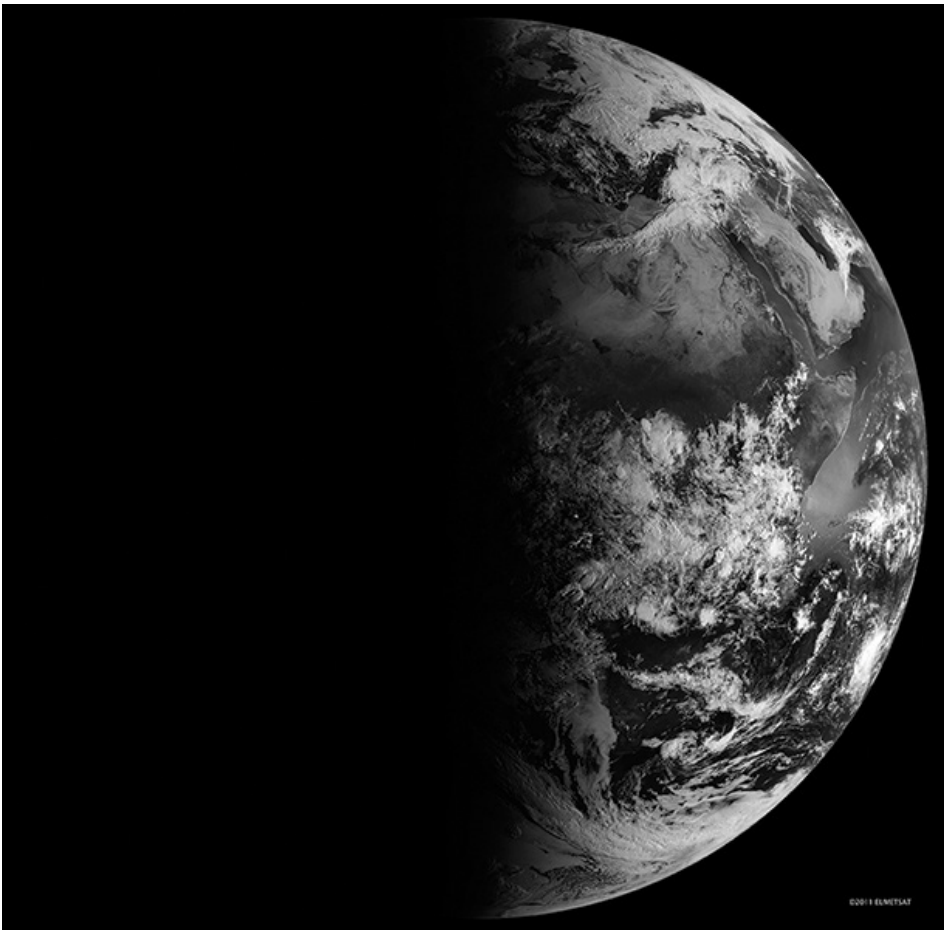
Spirit lasted over six years, eventually falling victim to a dust storm that blocked its solar panels from continuing to supply power to the little machine; Opportunity, though, outlived Spirit by several years, traveling around Mars for tens of miles before it, too, after about 15 years, was not able to respond when called.

What may not be known by many in this region is the local connections to these amazing craft. Professor Dave Cutts reminded us of one of his former Brown Ph.D. students, John Callas, who became Project Manager for both Spirit and Opportunity missions. He came back to Brown several times to talk about the two rovers.

Also, one of Rhode Island's own companies, EaglePicher, develops batteries for both space craft and military jets. The company, in addition to Spirit and Opportunity, also has its batteries on such missions as OSIRIS-REx and In-sight, and are working on providing batteries for the next Mars rover mission, right now set for 2020. EaglePicher was recently featured in Providence Business News, a great way to introduce non-scientists to the amazing work being done with respect to the company's work in powering our country's space exploration.



This chart provides a comparison of the distances driven by various wheeled vehicles on the surface of Mars and Earth's moon. Of the vehicles shown, NASA's Mars rovers Opportunity and Curiosity are still active and the totals listed are distances driven as of July 28, 2014. Image Credit: NASA/JPL-Caltech



Earth from orbit on the March equinox, as viewed by EUMETSAT. Notice how the terminator – the line between day and night - touches both the north and south poles. Additional information can be found at <http://bit.ly/earthequinox>
Image credit: NASA/Robert Simmon

NASA Night Sky Notes: Springtime Planet Party

By David Prosper

March brings longer days for Northern Hemisphere observers, especially by the time of the equinox. Early risers are treated to the majority of the bright planets dancing in the morning skies, with the Moon passing between them at the beginning and end of the month.

The **vernal equinox** occurs on **March 20**, marking the official beginning of spring for the Northern Hemisphere. Our Sun shines equally on the Northern and Southern Hemispheres during the moment of equinox, which is why the March and September equinoxes are the only times of the year when the Earth's north and south poles are simultaneously lit by sunlight. Exacting astronomers will note that the length of day and night on the equinox are not precisely equal; the date when they are closest to equal depends on your latitude, and may occur a few days earlier or later than the equinox itself. One complicating factor is that the Sun isn't a point light source, but a disc. Its edge is refracted by our atmosphere

as it rises and sets, which adds several minutes of light to every day. The Sun doesn't neatly wink on and off at sunrise and sunset like a light bulb, and so there isn't a perfect split of day and night on the equinox - but it's very close!

Ruddy **Mars** still shines in the west after sunset. Mars scoots across the early eve-

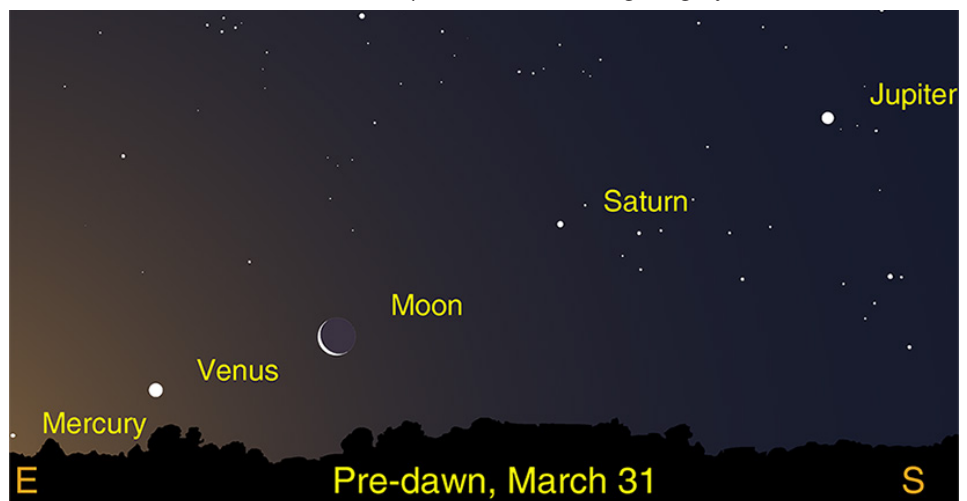
ning skies from Aries towards Taurus and meets the sparkling Pleiades star cluster by month's end.

March opens with the morning planets of **Jupiter**, **Saturn**, and **Venus** spread out over the southeastern horizon before sunrise. A crescent Moon comes very close to Saturn on the 1st and occults the ringed planet during the daytime. Lucky observers may be able to spot **Mercury** by the end of the month. March 31 opens with a beautiful set of planets and a crescent Moon strung diagonally across the early morning sky. Start with bright Jupiter, almost due south shortly before dawn. Then slide down and east towards Saturn, prominent but not nearly as bright as Jupiter. Continue east to the Moon, and then towards the beacon that is Venus, its gleam piercing through the early morning light. End with a challenge: can you find elusive Mercury above the eastern horizon? Binoculars may be needed to spot the closest planet to the Sun as it will be low and obscured by dawn's encroaching glow. What a way to close out March!

Discover all of NASA's current and future missions at nasa.gov



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



The morning planets on March 31. Image created with assistance from Stellarium.

Elliptical Galaxy in Cepheus

NGC 2300

by Glenn Chaple for LVAS

Magnitude: 11.0

Size: 3.2" X 2.8'

Ask a veteran deep-sky observer to name an NGC object close to Polaris, he or she will mention the open cluster NGC 188, located in Cepheus just $3\frac{1}{2}$ degrees to its south. We can add this month's Observer's Challenge, the elliptical galaxy NGC 2300, which is equally close to the Pole Star.

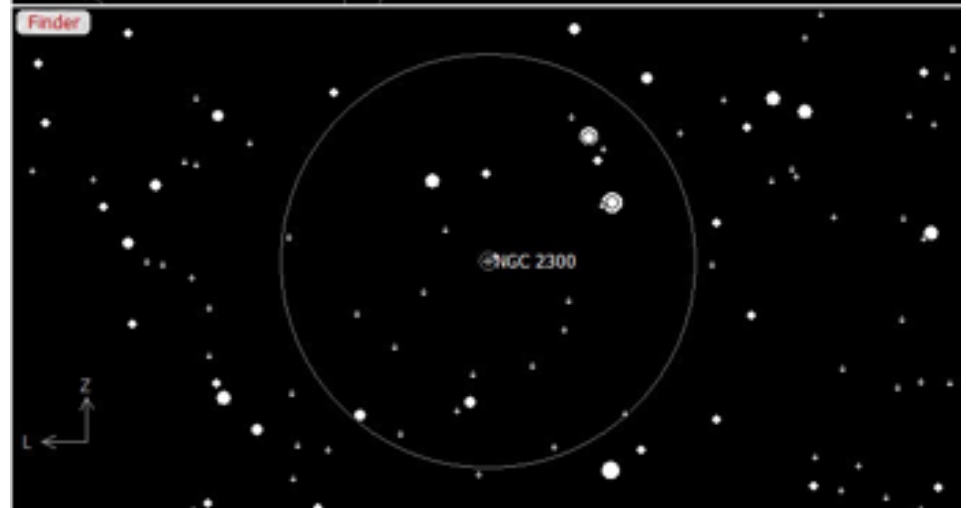
Before zooming in on NGC 2300, we need to look at its neighbor - the distorted spiral NGC 2276, which lies just 6.5' to the WNW. It's slightly smaller (2.6' X 2.3') and fainter (magnitude 11.6) than NGC 2300. NGC 2276 sports an unusual lopsided shape, which prompted Halton Arp to enter it as Arp 25 in his Atlas of Peculiar Galaxies. We need to include it in our discussion of NGC 2300 because Arp considered the NGC 2276/2300 pair-up (an elliptical-like galaxy and perturbed spiral) so noteworthy that he catalogued the duo as Arp 114.

NGC 2300 was discovered by the French astronomer Alphonse Borrelly (of periodic comet 19P/Borrelly fame) in 1871. Its actual galactic type is debatable, some sources listing it as elliptical; others as lenticular (a spiral-less spiral). Under exceptionally dark skies, NGC 2300 may be glimpsed with a 6-inch telescope. Descriptive notes in Luginbuhl and Skiff's Observing Handbook and Catalogue of Deep-sky Objects describe their visibility in a 10-inch scope - NGC 2300 "faintly" and NGC 2275 "barely". The two lie an estimated 110 to 120 light years away.

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



Carlos & Crystal Acosta/Adam Block/NOAO/AURA/NSF cseligman.com (north is up)



All finder charts for 2300 and NGC 2276 from bristolweather.org.uk/galaxies

The Sun, Moon & Planets in March

This table contains the ephemeris of the objects in the Solar System for each Saturday night in March 2019. Times in Eastern Standard Time (UTC-5) and Eastern Daylight Time (UTC-4 from March 10). Ephemeris times are for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
Sun	2	22 50.3	-7 24.1	Aqr	-26.8	1936.8	-	-	-	0.99	06:19	11:58	17:37
	9	23 16.3	-4 41.8	Aqr	-26.8	1933.4	-	-	-	0.99	06:08	11:56	17:46
	16	23 42.0	-1 56.7	Psc	-26.8	1929.8	-	-	-	0.99	06:56	12:55	18:54
	23	0 07.6	0 49.3	Psc	-26.8	1926.1	-	-	-	1.00	06:44	12:52	19:01
	30	0 33.1	3 34.0	Psc	-26.8	1922.1	-	-	-	1.00	06:32	12:50	19:09
Moon	2	19 27.6	-21 42.1	Sgr	-10.7	1753.4	51° W	18	-	-	04:16	09:04	13:55
	9	0 56.4	0 17.5	Cet	-9.3	1798.8	26° E	5	-	-	07:50	14:13	20:45
	16	7 05.6	21 22.6	Gem	-12.3	1971.4	110° E	67	-	-	13:40	21:19	04:52
	23	13 56.6	-6 55.0	Vir	-12.7	1943.8	153° W	95	-	-	21:05	02:53	08:32
	30	20 05.2	-21 06.8	Sgr	-11.3	1753.9	70° W	33	-	-	03:56	08:48	13:43
Mercury	2	23 51.2	1 26.6	Psc	0.3	7.9	18° E	35	0.31	0.85	06:49	12:57	19:06
	9	23 50.3	2 43.6	Psc	2.7	9.8	11° E	9	0.34	0.69	06:15	12:26	18:37
	16	23 30.0	0 27.4	Psc	6.2	11.0	4° W	1	0.38	0.61	06:36	12:38	18:39
	23	23 11.4	-3 03.7	Psc	2.6	10.8	15° W	10	0.42	0.63	06:03	11:53	17:42
	30	23 08.8	-5 14.7	Aqr	1.2	9.7	23° W	25	0.45	0.69	05:41	11:24	17:07
Venus	2	20 09.5	-19 19.1	Cap	-4.0	15.7	41° W	73	0.72	1.08	04:27	09:18	14:09
	9	20 44.0	-17 46.6	Cap	-3.9	15.0	39° W	75	0.73	1.12	04:28	09:25	14:22
	16	21 18.0	-15 49.3	Cap	-3.9	14.4	38° W	77	0.73	1.17	05:26	10:31	15:37
	23	21 51.4	-13 30.1	Cap	-3.9	13.9	37° W	79	0.73	1.22	05:23	10:37	15:52
	30	22 24.1	-10 52.1	Aqr	-3.9	13.4	35° W	81	0.73	1.26	05:18	10:42	16:07
Mars	2	2 31.4	15 35.6	Ari	1.2	5.3	59° E	92	1.53	1.78	08:37	15:38	22:40
	9	2 49.9	17 05.2	Ari	1.3	5.1	57° E	92	1.54	1.83	08:22	15:29	22:37
	16	3 08.7	18 28.1	Ari	1.3	4.9	55° E	93	1.55	1.89	09:07	16:20	23:34
	23	3 27.7	19 43.5	Ari	1.4	4.8	52° E	93	1.56	1.95	08:53	16:12	23:31
	30	3 47.0	20 51.1	Tau	1.4	4.7	50° E	94	1.57	2.00	08:40	16:03	23:27
1 Ceres	2	16 37.2	-15 50.1	Oph	8.6	0.5	91° W	97	2.70	2.49	00:40	05:44	10:47
	9	16 42.9	-16 03.5	Oph	8.5	0.5	97° W	97	2.70	2.40	00:19	05:22	10:24
	16	16 47.6	-16 15.0	Oph	8.4	0.5	103° W	97	2.71	2.31	00:57	05:59	11:01
	23	16 51.2	-16 25.0	Oph	8.3	0.6	109° W	97	2.71	2.23	00:34	05:35	10:36
	30	16 53.7	-16 33.8	Oph	8.2	0.6	115° W	97	2.72	2.14	00:09	05:10	10:10
Jupiter	2	17 25.3	-22 34.2	Oph	-1.9	36.2	79° W	99	5.33	5.43	01:56	06:31	11:07
	9	17 28.5	-22 36.7	Oph	-1.9	37.0	85° W	99	5.33	5.32	01:32	06:07	10:42
	16	17 31.1	-22 38.4	Oph	-2.0	37.8	92° W	99	5.33	5.20	02:07	06:42	11:17
	23	17 33.1	-22 39.7	Oph	-2.0	38.7	98° W	99	5.33	5.09	01:42	06:17	10:52
	30	17 34.6	-22 40.5	Oph	-2.1	39.5	105° W	99	5.32	4.98	01:16	05:51	10:25
Saturn	2	19 17.0	-21 49.4	Sgr	0.6	15.6	53° W	100	10.06	10.62	03:44	08:23	13:02
	9	19 19.5	-21 45.1	Sgr	0.6	15.7	60° W	100	10.06	10.52	03:19	07:58	12:37
	16	19 21.6	-21 41.1	Sgr	0.6	15.9	66° W	100	10.06	10.42	03:53	08:32	13:12
	23	19 23.6	-21 37.6	Sgr	0.6	16.1	73° W	100	10.06	10.31	03:27	08:07	12:46
	30	19 25.2	-21 34.6	Sgr	0.6	16.2	79° W	100	10.06	10.19	03:01	07:41	12:21
Uranus	2	1 51.6	10 56.1	Ari	5.9	3.4	49° E	100	19.86	20.50	08:14	14:56	21:38
	9	1 52.8	11 02.7	Ari	5.9	3.4	42° E	100	19.85	20.58	07:48	14:30	21:12
	16	1 54.1	11 09.8	Ari	5.9	3.4	35° E	100	19.85	20.66	08:21	15:04	21:47
	23	1 55.4	11 17.4	Ari	5.9	3.4	29° E	100	19.85	20.72	07:54	14:38	21:21
	30	1 56.8	11 25.2	Ari	5.9	3.4	22° E	100	19.85	20.77	07:28	14:12	20:55
Neptune	2	23 09.9	-6 25.1	Aqr	8.0	2.2	5° E	100	29.94	30.92	06:36	12:15	17:54
	9	23 10.8	-6 19.0	Aqr	8.0	2.2	2° W	100	29.94	30.93	06:09	11:48	17:28
	16	23 11.8	-6 12.9	Aqr	8.0	2.2	9° W	100	29.94	30.92	06:42	12:22	18:02
	23	23 12.8	-6 06.9	Aqr	8.0	2.2	15° W	100	29.94	30.90	06:15	11:55	17:36
	30	23 13.7	-6 01.0	Aqr	8.0	2.2	22° W	100	29.94	30.86	05:48	11:29	17:09
Pluto	2	19 37.2	-21 45.5	Sgr	14.4	0.2	49° W	100	33.75	34.40	04:04	08:43	13:22
	9	19 37.9	-21 44.6	Sgr	14.4	0.2	56° W	100	33.76	34.31	03:37	08:16	12:55
	16	19 38.5	-21 43.8	Sgr	14.4	0.2	62° W	100	33.76	34.21	04:10	08:49	13:28
	23	19 39.0	-21 43.3	Sgr	14.4	0.2	69° W	100	33.77	34.11	03:43	08:22	13:01
	30	19 39.4	-21 43.0	Sgr	14.4	0.2	76° W	100	33.77	34.00	03:16	07:55	12:34

History Notes

by Dave Huestis

Skyscrapers Members,

While the Skyscrapers organization has maintained a core group of members over the decades, we have welcomed many new members over the last few years.

Perhaps those of you in that category are not aware of the rich history of Skyscrapers, or that of Frank Evans Seagrave (FES) and his beloved observatory that we proudly own.

I encourage you to visit our web site and read about the people and events that made Skyscrapers the wonderful society we are

today.

To start our historical journey we must first begin with FES. Many of the highlights of his life and his many contributions to astronomy can also be found up on our web site.

There are some interesting historical tidbits that have not been posted for some time, so I thought I would bring two of them to your attention.

On June 24, 1934, Frank sent a couple of Reminiscences to Popular Astronomy. I re-print them here for your enjoyment.

Frank Evans Seagrave passed away less than two months later on August 15, 1934.



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>

General Notes

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Book Reviews

dividing it into three periods; 1. from the ancient and medieval time up to the Renaissance; 2. from the Renaissance to the foundation of the Observatories of the Roman College and the Campidoglio at the end of the eighteenth century and at the beginning of the nineteenth; 3. from that time to the present time.

Professor Emanuelli speaks of the calendar reform in 1582, of Galileo's Trial in 1633, of the School of Astronomy at the Roman College at the time of Clavio, of the works of Scheiner, Bianchini, Secchi, Millosevich and other Roman astronomers.

American Astronomical Society.—The fifty-second meeting of the American Astronomical Society will be held at Connecticut College, New London, Connecticut, September 10-12, 1934, on the invitation of Professor G. K. Daghljan.

The tentative program is as follows:

Monday, September 10, 11:00 A.M., Council Meeting; 2:00 P.M., Session for Papers.

Tuesday, September 11, 9:00 A.M., Council Meeting; 9:30 A.M., Session for Papers; 2:00 P.M., Business Meeting.

Wednesday, September 12, 9:30 A.M., Session for Papers.

The customary special dinner will probably take the form of a picnic supper on Tuesday evening. Members may make use of the college tennis courts, and swimming at Ocean Beach is suggested.

Those desiring dormitory rooms and meals at the college should make their reservations with Professor Daghljan. The charge will be three dollars a day. Members who have acted as hosts know, and others can readily imagine, how much an early and accurate statement of accommodations desired will be appreciated. It is particularly important to know who will be present for luncheon on Monday. Recommended hotels are the Mohican Hotel and the Crocker House.

The frequent trains on the N. Y., N. H. & H. R. R., via Shore Line, make stops at New London. Perhaps the Vermont Central should be mentioned also. It runs through Amherst and a few other places. The New London boat leaves New York daily at 11:00 A.M., arriving in time for supper. A bus line runs from near the railroad station to the college.

Titles of papers should be sent in by July 31. There are numerous advantages in sending in abstracts, in form for publication, before the meeting.

RAYMOND S. DUGAN, *Secretary*.

Princeton University Observatory, Princeton, New Jersey, June 1, 1934.

Reminiscences

I. On the night of May 12, 1876 (*remember 1876*), Dr. Leonard Waldo, assistant at the Harvard College Observatory, was observing double stars with a filar micrometer attached to the 15-inch equatorial telescope. I recorded the observations for him. After making several settings, Dr. Waldo went downstairs to the library for a book. In about ten minutes he returned to the dome, greatly excited. He said, "Seagrave, I want you to come right down to the library and see what is going to be one of the greatest inventions of the nineteenth century." I went down to the library with him, and there was Professor William A. Rogers, assistant and in charge of the meridian circle, talking through what appeared to me to be a box. He would talk, then put the box to his ear to listen, then talk, and then listen again. Dr. Waldo said to me, "Do you know to whom he is talking and listening?" I said "No." Waldo said, "He is talking to a party in Boston five miles away." I became greatly interested right away. I talked and

listened myself as soon as Professor Rogers had finished, and I found that I had been talking to Professor A. Graham Bell, inventor of the telephone. He was then experimenting between his Boston laboratory and several places a few miles away.

The next day I went to Providence where I then lived. I told many people what I had seen and heard on the previous night. My parents were then living. They all laughed and ridiculed the idea of talking to a party five miles away through a box. They all said I had been talking to somebody in the next room or downstairs. The afternoon that I arrived in Providence I went into Tibbetts and Randall's bookstore on Westminster Street. I was well acquainted with both gentlemen, as I had bought many books there. I told them of my experience on the previous evening. They both, and every customer who came in, ridiculed and made fun of me. To cap the climax, both Tibbetts and Randall went to my father and insisted upon it that I be sent away for observation,—the idea of talking such nonsense.

All of this happened in May, 1876. I was only 16 years old then. I am now 74. This is not wholly astronomical. Bell lectured in Providence the following September to a crowded house.

II. On the night of August 16, 1877, I was one of a party of seven people who were up in the dome of the 15-inch equatorial telescope of the Harvard College Observatory. We were all greatly interested in observing the then newly discovered satellites of Mars, made three days earlier by Professor Asaph Hall, then of the U. S. Naval Observatory at Washington. The seven who were there included Professors E. C. Pickering, William A. Rogers, Arthur Searle, Leonard Waldo, Winslow Upton, George B. Clark of the firm of Alvan Clark & Sons, and myself. After we had all seen the satellites, a photometer was placed at the eye-end of the telescope, and Professor Pickering started a series of photometric measures of the brightness of the satellites. Just before midnight, the photometer was taken off and a filar micrometer put on. Dr. Waldo made many measures of positions and distances of the satellites, and did not finish until dawn of August 17. I recorded the observations for him.

I am writing this as I am the only one living of the seven up in that dome that night. The other six have passed on.

FRANK E. SEAGRAVE.

8 Durham Street, Boston, Massachusetts, June 25, 1934.

Errata.—Mr. Wen Shion Tsu has called attention to several errors in his paper which appeared in the April issue of POPULAR ASTRONOMY for this year. The corrections are as follows:

- p. 195, Art. 9, line 3, "Year" should be "Yeou."
- p. 195, Art. 10, line 5, "S, V," should be "ξ, η."
- p. 195, Art. 10, line 6, "B and N" should be "β and η."
- p. 197, Art. 15, line 5, "5 Sagittarii" should be "Sagittarii."
- p. 199, Art. 21, line 7, "x Ursae Majoris" should be "χ Ursae Majoris."

Book Reviews

Handbuch der Astrophysik, Vol. V, Second half. Edited by G. Eberhard, A. Kohlschütter, H. Ludendorff. (Julius Springer, Publisher, Berlin, Germany. 96 marks; bound 99 marks.)

The first half of this volume of this monumental work was described in the

Image Gallery



Waxing crescent Moon with labels by Tracy Prell.



The Pleiades, using an Orion 8" f/4 astrograph and Nikon DF camera. Image by Bob Horton



M1 Crab Nebula taken on two nights, 12/30/2018 and 02/5/2019 by Lloyd Merrill
Telescope C-14, at f/7
Camera: SBIG STF-8300C
30X300" images captured using Maxim DL
Calibrated against dark, bias and flat frames using Maxim DL
Further post processing using PixInsight

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