



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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Upcoming Events

See inside for details

AstroAssembly

September 30 & October 1



Star Party October 9



October 8



URI Planetarium October 14



Center for Astrophysics Lecture Webcasts
at Seagrave Observatory
October 20 & November 17

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

Skyscrapers Workshop Series
October 15, 22, 29, November 5, 12 & 19

Phases of the Moon

- New Moon**
October 1 00:11
- First Quarter Moon**
October 9 04:33
- Full Hunters Moon**
October 16 04:23
- Last Quarter Moon**
October 22 19:14
- New Moon**
October 30 17:38



Seagrave Memorial Observatory
Open Nights

Saturdays at 7:00 pm
weather permitting

Upcoming Star Parties

Star party requests as of September 30, 2016

Saturday, October 8

International Observe the Moon Night, on the State House Lawn, 7:00 – 10:00 P.M. Bring your telescope, and enjoy the sky against the backdrop of one of the most beautiful buildings in Rhode Island;

Sunday, October 9

Cabot Cheese Festival at Fort Hill Farms, Thompson, Connecticut, 7:00 – 9:00 P.M. Situated just about 20 miles west of Sea-

grave Observatory, Fort Hill Farms boasts one of the darkest skies in the region. Although the Moon will be in its 1st quarter phase, you will still be able to see the beauty of this location – plus, it has a corn maze. And, we have been promised cheese to take home.

Friday, November 18

4H Group at Seagrave Observatory

Friday, December 17

Toni Arruda with Cub Scout group at Seagrave Observatory

Please contact Francine if you are interested in being a part of any of these.

Dates not set

Jenn Tierney with 20 homeschoolers at Seagrave Observatory

Jim Crawford is scheduling one at Portsmouth Middle School some time in October. Please speak to him on this one.

Star parties are always fun, and it's a great way to interest people of all ages on the wonders of the sky. Please be a part of them when you can. You don't need a telescope, just a love of astronomy.

Two Small Pieces of Glass Presented at the University of Rhode Island Planetarium

URI Campus, Upper College Road
Kingston, RI 02881

Friday, October 14th, 2016, 6:00 P.M.

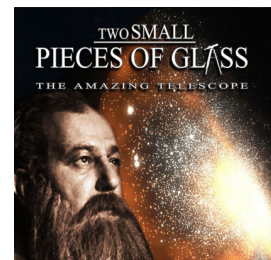
The telescope introduced the sky as had never been seen. It showed that some objects were not point sources, but actual bodies: planets, star clusters, and, eventual-

ly, independent galaxies. Join the URI Planetarium as we learn the history of this very important tool that opened our eyes to new worlds of our celestial sphere.

This program, for the general audience, will be preceded by a short program, Losing the Dark on light trespass, and then will be followed by a live presentation on the Sky above the URI Campus. Admission is just \$5.00, to benefit the URI Planetarium

Fund.

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



Center for Astrophysics Lecture Nights at Seagrave Observatory

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

these programs are streamed, so Skyscrapers, Inc., will be scheduling “movie night” at Seagrave, where we can enjoy the talk in the comfort of the clubhouse.

The first, **October 20th**, will be “America's Coast-to-Coast Total Solar Eclipse,” by J. Kelly Beatty, beginning precisely at 7:30 P.M., when emcee Christine Pulliam starts her introduction of the evening's speaker.

The talks normally last about an hour, and, as is done there, if skies are clear, we can do our own observing. Bring food, and get set for an interesting talk.

November 17th will feature Paul J. Green, with “The Care and Feeding of Monster Black Holes.”



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 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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International
OBSERVE THE
MOON
NIGHT
2016

October

SAVE THE DATE **8TH**



#observethemoon

OBSERVETHEMOONNIGHT.ORG

International Observe the Moon Night

Saturday, October 8

7-10pm

Rhode Island State Capitol Grounds

Join Skyscrapers, Inc., as it Celebrates the International Observe the Moon Night on the State House Lawn!

Contact Steve Siok, President, Skyscrapers, Inc.: ssiok@cox.net

The Moon has always been an object of wonder, and on Saturday, October 8th, Skyscrapers, Inc., will join hundreds of organizations around the world in showing the beauty of our nearest celestial neighbor.

Please join amateur and professional astronomers as they set up telescopes on the southeast corner of the State House lawn Saturday, October 8th, from 7:00 to 10:00 P.M., as part of an international effort to introduce our Moon as a beautiful part of our sky. Over a dozen telescopes will be aimed at the Moon, each showing a unique feature on its surface.

This evening, ideal for all ages, is a great way to learn about astronomy firsthand, to interact with local scientists, and to just enjoy the beauty of our nearest neighbor.

This program is sponsored by the Chandra X Ray Observatory and Skyscrapers, Inc., Rhode Island's Amateur Astronomy Society. For more information, please contact Steve Siok, at ssiok@cox.net

OBSERVE THE
MOON
NIGHT

This **FREE** public event will be held on **Saturday, October 8 2016** from 7 pm to 10 pm on the **RI State Capital grounds!** Hosted by Skyscrapers, Inc.

Sponsored by
NASA's
Kim Arcand



LUNAR AND
PLANETARY
INSTITUTE



COSMOQUEST

Science Festival
Alliance

Introduction to Amateur Astronomy Workshop Series

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

October 15: The Sun

Astronomy is usually thought to be just a nighttime activity; but, we have one of the most important astronomical objects over our heads each day: The Sun. Our Sun will be especially important as a total solar eclipse will take place next year. Come and hear Brown University Physics Professor and amateur astronomer Ian Dell'Antonio introduce you to this beautiful event.

October 22: Celestial Coordinates

You're becoming interested in learning more about the sky, but there seem to be so many new words to learn. What is right ascension? Ecliptic? How do they fit in with the sky?

Steve Siok, an amateur astronomer for over forty years, and president of Skyscrapers, Inc., will put all of the language of the sky together. After taking this workshop, you will be talking astronomy and enjoying it so much more.

October 29: Identifying the Autumn Constellations

Have you ever looked up at the night sky, and wondered what stars you were seeing? What constellation patterns are being made overhead? Francine Jackson will introduce you to the skies for this time of year. Using Stellarium, a free astronomical program, you will be introduced to the skies of the season, and also how to find very easy deep-sky objects.

November 5: Backyard Observatories

Did you ever get frustrated with the time and effort to set up a telescope for observing? Skyscraper member Steve Hubbard did, and found that a backyard home observatory was the perfect cure. Ever wondered about having an observatory or your own? Steve will take the mystery away with some practical tips and solutions to help you decide if having a simple, easy to build backyard home for your telescope is for you.

November 12: Introduction to Astrophotography

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

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

November 19: Using a Telescope

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

Skyscraper member Jeff Padell will introduce you to the basics of taking your equipment outside and using it to find the beautiful celestial objects waiting to be seen through a telescope. From setting our equipment up, to learning how to find some easy and challenging objects, to care and maintenance of your instrument, Jeff will have you enjoying your new hobby, or learning which telescope is right for you, before the night is over.

Skyscrapers, Inc., the Amateur Astronomical Society of Rhode Island, is a nonprofit organization begun in 1932 by Brown University Professor Charles Smiley. Its mission is to educate its membership and the public on all matters pertaining to astronomy. For more information concerning the organization, please visit our website at www.theskyscrapers.org

The Sun, Moon & Planets in October

This table contains the ephemeris of the objects in the Solar System for each Saturday night in October. Times are in Eastern. Time calculated for Seagrave Observatory (41.845N, 71.590W).

Object	Date	RA	Dec	Const	Mag	Size	Elong	Phase(%)	Dist(S)	Dist(E)	Rise	Transit	Set
Sun	1	12 30.3	-3 16.2	Vir	-26.8	1917	-	-	-	1.00	06:43	12:35	18:27
	8	12 55.8	-5 57.8	Vir	-26.8	1920.9	-	-	-	1.00	06:51	12:33	18:15
	15	13 21.6	-8 35.6	Vir	-26.8	1924.8	-	-	-	1.00	06:58	12:31	18:04
	22	13 47.9	-11 07.4	Vir	-26.8	1928.6	-	-	-	1.00	07:07	12:30	17:53
	29	14 14.7	-13 31.1	Vir	-26.8	1932.2	-	-	-	0.99	07:15	12:30	17:44
Moon	1	12 31.0	-1 45.5	Vir	-4.0	1779.7	2° W	0	-	-	07:09	13:09	19:02
	8	18 05.5	-19 16.7	Sgr	-11.5	1807.3	77° E	39	-	-	13:29	18:29	23:31
	15	0 25.8	0 23.0	Psc	-12.8	2000.9	163° E	98	-	-	18:06	00:37	07:17
	22	7 21.2	17 13.8	Gem	-12.1	1895.2	100° W	59	-	-	23:02	06:25	13:44
	29	13 05.5	-4 31.9	Vir	-8.6	1761.8	19° W	3	0.99	-	06:00	11:50	17:34
Mercury	1	11 28.2	5 02.5	Leo	-0.6	6.6	18° W	60	0.31	1.02	05:13	11:34	17:54
	8	12 07.1	1 20.4	Vir	-1.0	5.6	14° W	84	0.33	1.19	05:39	11:46	17:52
	15	12 50.9	-3 36.0	Vir	-1.1	5.1	9° W	95	0.37	1.32	06:13	12:03	17:51
	22	13 34.9	-8 41.9	Vir	-1.1	4.8	4° W	99	0.41	1.40	06:48	12:19	17:49
	29	14 18.5	-13 27.1	Vir	-1.1	4.7	1° E	100	0.44	1.43	07:22	12:35	17:47
Venus	1	14 26.1	-14 42.1	Lib	-3.8	12.3	31° E	85	0.73	1.38	09:24	14:32	19:39
	8	14 59.5	-17 36.4	Lib	-3.8	12.7	32° E	84	0.73	1.34	09:41	14:38	19:34
	15	15 33.8	-20 09.5	Lib	-3.9	13.1	34° E	82	0.73	1.30	09:59	14:45	19:30
	22	16 09.1	-22 17.2	Sco	-3.9	13.5	35° E	80	0.73	1.25	10:16	14:52	19:29
	29	16 45.1	-23 55.7	Oph	-3.9	14.0	37° E	79	0.73	1.21	10:31	15:01	19:30
Mars	1	18 10.7	-25 49.1	Sgr	0.1	8.8	84° E	85	1.39	1.07	13:54	18:15	22:36
	8	18 31.5	-25 33.0	Sgr	0.1	8.4	82° E	85	1.38	1.11	13:46	18:08	22:31
	15	18 52.7	-25 05.9	Sgr	0.2	8.1	80° E	85	1.38	1.15	13:37	18:02	22:27
	22	19 14.2	-24 27.5	Sgr	0.3	7.9	78° E	86	1.38	1.19	13:28	17:56	22:24
	29	19 35.7	-23 37.7	Sgr	0.3	7.6	76° E	86	1.38	1.23	13:18	17:50	22:22
1 Ceres	1	2 19.3	0 03.8	Cet	7.8	0.6	153° W	99	2.89	1.96	20:21	02:23	08:25
	8	2 14.4	0 23.4	Cet	7.6	0.6	159° W	100	2.89	1.93	19:46	01:46	07:46
	15	2 08.7	0 48.7	Cet	7.5	0.7	165° W	100	2.88	1.91	19:14	01:13	07:11
	22	2 02.6	-1 10.1	Cet	7.4	0.7	167° E	100	2.88	1.90	18:42	00:39	06:37
	29	1 56.3	-1 26.3	Cet	7.5	0.7	164° E	100	2.87	1.90	18:09	00:06	06:02
Jupiter	1	12 18.8	0 50.3	Vir	-1.5	30.5	4° W	100	5.45	6.45	06:23	12:22	18:21
	8	12 24.3	-1 26.0	Vir	-1.5	30.6	9° W	100	5.45	6.44	06:03	12:00	17:57
	15	12 29.8	-2 01.2	Vir	-1.5	30.7	14° W	100	5.45	6.41	05:43	11:38	17:33
	22	12 35.3	-2 35.7	Vir	-1.5	30.8	20° W	100	5.45	6.38	05:23	11:16	17:08
	29	12 40.6	-3 09.5	Vir	-1.5	31.1	25° W	100	5.45	6.33	05:03	10:54	16:44
Saturn	1	16 41.2	-20 44.8	Oph	0.5	15.8	63° E	100	10.04	10.45	12:00	16:43	21:27
	8	16 43.5	-20 50.3	Oph	0.6	15.7	57° E	100	10.04	10.55	11:35	16:18	21:01
	15	16 46.0	-20 56.0	Oph	0.6	15.6	51° E	100	10.04	10.64	11:11	15:53	20:36
	22	16 48.7	-21 01.9	Oph	0.6	15.4	44° E	100	10.04	10.73	10:46	15:28	20:10
	29	16 51.6	-21 07.8	Oph	0.5	15.3	38° E	100	10.04	10.81	10:22	15:04	19:45
Uranus	1	1 26.4	8 22.8	Psc	5.7	3.7	165° W	100	19.95	18.98	18:54	01:27	07:59
	8	1 25.4	8 16.6	Psc	5.7	3.7	172° W	100	19.95	18.96	18:26	00:58	07:30
	15	1 24.3	8 10.3	Psc	5.7	3.7	179° W	100	19.95	18.95	17:58	00:29	07:01
	22	1 23.2	8 04.1	Psc	5.7	3.7	173° E	100	19.95	18.96	17:30	00:01	06:32
	29	1 22.2	7 57.9	Psc	5.7	3.7	166° E	100	19.95	18.98	17:02	23:32	06:03
Neptune	1	22 47.1	-8 40.4	Aqr	7.8	2.3	152° E	100	29.95	29.07	17:17	22:48	04:18
	8	22 46.5	-8 43.9	Aqr	7.8	2.3	145° E	100	29.95	29.13	16:49	22:20	03:50
	15	22 45.9	-8 47.0	Aqr	7.8	2.3	138° E	100	29.95	29.21	16:21	21:52	03:22
	22	22 45.5	-8 49.6	Aqr	7.8	2.3	130° E	100	29.95	29.3	15:54	21:24	02:54
	29	22 45.1	-8 51.7	Aqr	7.8	2.3	123° E	100	29.95	29.4	15:26	20:56	02:26
Pluto	1	19 04.2	-21 24.5	Sgr	14.3	0.2	97° E	100	33.19	33.05	14:25	19:06	23:46
	8	19 04.4	-21 25.2	Sgr	14.3	0.2	90° E	100	33.19	33.18	13:58	18:38	23:19
	15	19 04.6	-21 25.8	Sgr	14.3	0.2	83° E	100	33.19	33.3	13:31	18:11	22:51
	22	19 04.9	-21 26.2	Sgr	14.3	0.2	76° E	100	33.20	33.42	13:04	17:44	22:24
	29	19 05.4	-21 26.4	Sgr	14.3	0.2	69° E	100	33.20	33.54	12:36	17:17	21:57

Meteors and other Astronomical Treats

by Dave Huestis

I hope many of you had the good fortune of watching the Perseid meteor shower on the peak night of August 11-12. Just prior to the event some astronomers were predicting a brief but substantial increase in activity. Unfortunately that scenario never manifested itself here. I counted 23 Perseids between 1:10 a.m. and 2:50 a.m. Clouds finally blotted out the stars at that end time. Many of the meteors swept through Pegasus, while others streaked down the Milky Way. Some of the brighter shower members left trains of dust that lasted for one to two seconds, making for a decent display of shooting stars this year.

If you happen to travel in a westerly direction after sunset during the next several months, that very bright heavenly beacon you see in the sky will be Venus. This planet, named for the goddess of love, and Earth will be moving closer together as the pair revolves around the Sun in their respective orbits. Through a telescope the image size of Venus will dramatically increase, yet at the same time, the illuminated phase (Venus goes through phases similar to that of the Moon) will decrease. It is best to telescopically observe Venus in a twilight sky so its brilliance does not overwhelm the

view in the eyepiece.

If the Perseids didn't satisfy your appetite for watching "burning rocks" fall from the sky, then mark your calendar for the night of October 7-8 to watch the minor meteor shower called the Draconids. Though this shooting star display only produces ten or less yellowish slow moving meteors per hour, a waxing crescent Moon (First Quarter on the 9th) will set around 10:30 p.m. and will slightly interfere with observing as many meteors as possible. This shower of particles is debris shed by periodic Comet 21 P/ Giacobini-Zinner.

All you have to do to observe as many meteors as possible is to gaze northwards and find Ursa Major (Big Bear), the Big Dipper asterism. At the midnight hour Ursa Minor (Little Bear), the Little Dipper asterism, will be above Ursa Major. The radiant point, in the head of the dragon, will be to the left of the Little Dipper. While the meteors will emanate from this region of the sky, scan east and west up to zenith (directly overhead). These particles are fairly slow moving, hitting our atmosphere at only 12.5 miles per second. As the night progresses watch the northern sky rotate around Polaris, the Earth's pole star located at the end

of the Little Dipper handle.

If you love to observe astronomical events during the quiet time after midnight, then set aside a little more than an hour during the early morning of October 19 to experience once again an occultation of the bright star Aldebaran in the constellation Taurus' Hyades star cluster. As the waning gibbous Moon moves eastward in our sky, it will pass in front of Aldebaran along the Moon's bright limb (left edge) at approximately 1:49 a.m. EDT, and will reappear along the Moon's dark limb (right edge) at approximately 2:53 a.m. EDT. You may see dimmer stars covered and/or uncovered during this time as well, and earlier in the evening on the 18th the Moon will pass in front of other stars in the Hyades cluster too. You will not need a telescope to watch Aldebaran disappear and reappear, although binoculars will enhance the view. With a telescope you might see the star blink as it passes behind crater walls or lunar mountains. Give it a try.

And finally, on the night of October 20-21, the peak of the Orionid meteor shower occurs when the Earth passes through the remnants of Halley's Comet. Generally a decent meteor shower, an interfering waning gibbous Moon (last quarter on the 23rd) will rise locally on the 20th around 10:00 p.m. in the feet of Gemini the twins. This placement is very close to the shower's radiant point in the constellation of Orion, not far from the bright red super giant star Betelgeuse. This scenario will most certainly affect observing the peak rate of about 20 or so yellow and green meteors per hour between midnight and dawn's early light. The Orionid meteors disintegrate in our atmosphere around 41.6 miles per second, and they are also noted for producing fireballs that create persistent dust trains as they blaze across the sky.

While Orion is an easy star pattern to identify, at 3:00 a.m. this giant constellation can be found high in the southeast sky. See accompanying star map.

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 (<http://www.theskyscrapers.org>) in North Scituate is open every clear Saturday night. (Note: Seagrave will be closed on October 1 due to our an-



nual AstroAssembly convention, and we will also be closed on October 29 for a special member's only night). Ladd Observatory (<http://www.brown.edu/Departments/Physics/Ladd/>) in Providence is open every Tuesday night. The Margaret M. Jacoby Observatory at the CCRI Knight Campus in Warwick (<http://www.ccri.edu/phys->

[ics/observatory.htm](http://www.ccri.edu/phys-ics/observatory.htm)) is open every clear Wednesday night. And our good friends down at Frosty Drew Observatory (<http://frostydrew.org>) in Charlestown open every clear Friday night.

Clear skies for all your observing adventures.

Great American Total Solar Eclipse on

August 21, 2017. Countdown: 323 days as of October 1, 2016.



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>

Barred Spiral Galaxy in Pegasus

NGC 7479

by Las Vegas Astronomical Society

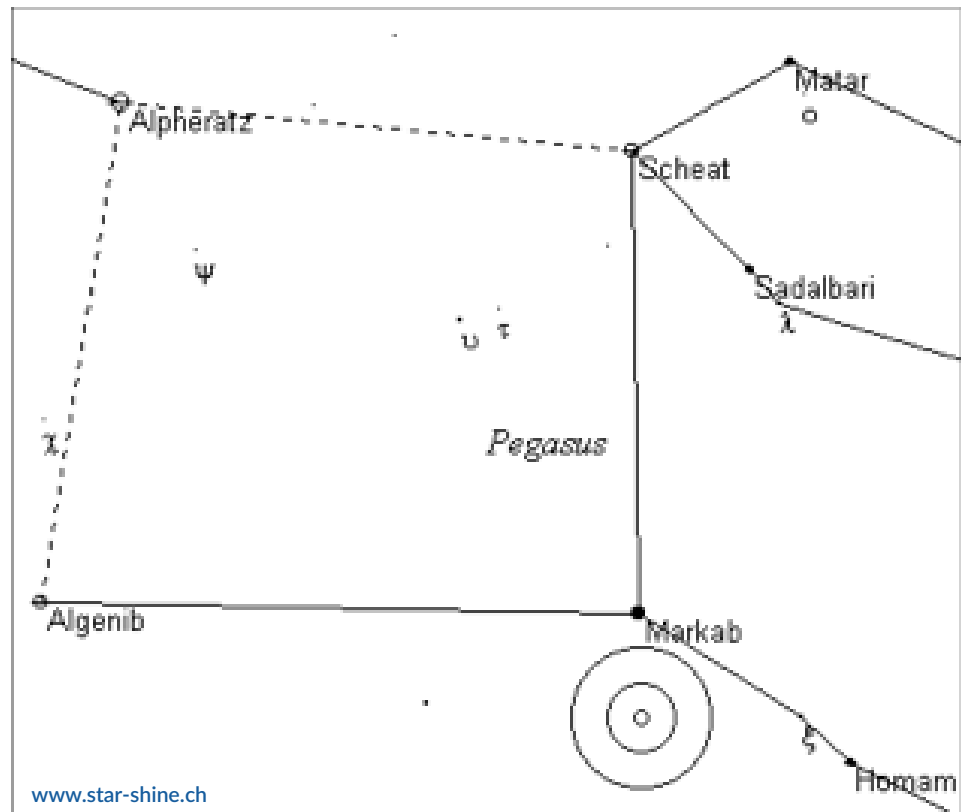
NGC 7479 (the 44th entry in Patrick Moore's Caldwell Catalog) is a barred spiral galaxy located in the southwest corner of Pegasus. The accompanying finder chart shows its location about 2 ½ degrees south of the 2nd magnitude star Markab. It was discovered in 1784 by William Herschel, who described it as "Considerably bright, much extended, gradually brighter in the middle, 4' long and 2' broad."

NGC 7479 presents us with a pair of challenges. What is the smallest telescope that can capture the galaxy, and what is the least aperture that will reveal its barred structure? In modern times, NGC 7479 has spawned two supernovae – SN 1990U and SN 2009jf. This huge barred spiral is located about 105 million light years away and is perhaps 20% larger than our Milky Way.

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.



Fort Lewis (CO) College Observatory 16" Schmidt Cassegrain (www.ftlewis.edu)



One Incredible Galaxy Cluster Yields Two Types of Gravitational Lenses

by Ethan Siegel

There is this great idea that if you look hard enough and long enough at any region of space, your line of sight will eventually run into a luminous object: a star, a galaxy or a cluster of galaxies. In reality, the universe is finite in age, so this isn't quite the case. There are objects that emit light from the past 13.7 billion years—99 percent of the age of the universe—but none before that. Even in theory, there are no stars or galaxies to see beyond that time, as light is limited by the amount of time it has to travel.

But with the advent of large, powerful space telescopes that can collect data for the equivalent of millions of seconds of observing time, in both visible light and infrared wavelengths, we can see nearly to the edge of all that's accessible to us.

The most massive compact, bound structures in the universe are galaxy clusters that are hundreds or even thousands of times the mass of the Milky Way. One of them, Abell S1063, was the target of a recent set of Hubble Space Telescope observations as part of the Frontier Fields program. While the Advanced Camera for Surveys instrument imaged the cluster, another instrument, the Wide Field Camera 3, used

an optical trick to image a parallel field, offset by just a few arc minutes. Then the technique was reversed, giving us an unprecedentedly deep view of two closely aligned fields simultaneously, with wavelengths ranging from 435 to 1600 nanometers.

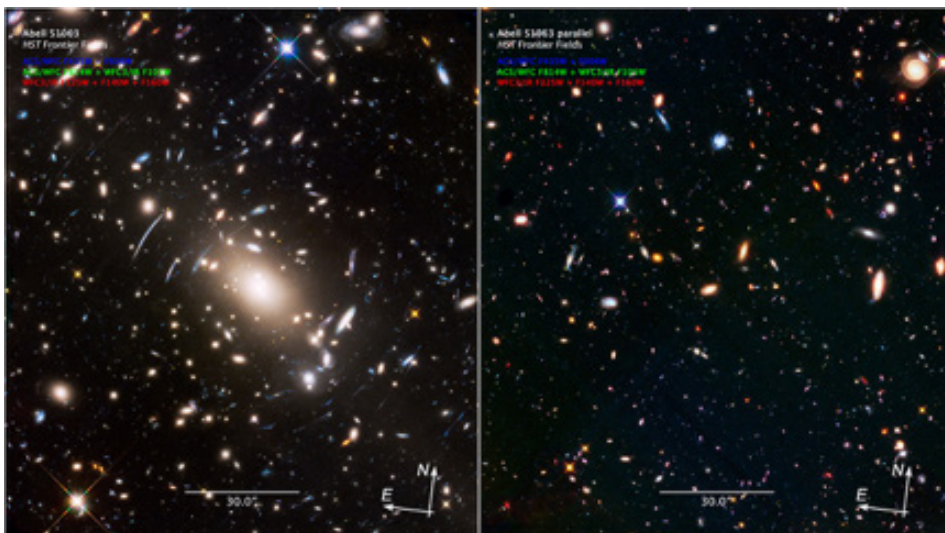
With a huge, towering galaxy cluster in one field and no comparably massive objects in the other, the effects of both weak and strong gravitational lensing are readily apparent. The galaxy cluster—over 100 trillion times the mass of our sun—warps the fabric of space. This causes background light to bend around it, converging on our eyes another four billion light years away. From behind the cluster, the light from distant galaxies is stretched, magnified, distorted, and bent into arcs and multiple images: a classic example of strong gravitational lensing. But in a subtler fashion, the less optimally aligned galaxies are distorted as well; they are stretched into elliptical shapes along concentric circles surrounding the cluster.

A visual inspection yields more of these tangential alignments than radial ones in the cluster field, while the parallel field exhibits no such shape distortion. This effect, known as weak gravitational lensing, is a

very powerful technique for obtaining galaxy cluster masses independent of any other conditions. In this serendipitous image, both types of lensing can be discerned by the naked eye. When the James Webb Space Telescope launches in 2018, gravitational lensing may well empower us to see all the way back to the very first stars and galaxies.

If you're interested in teaching kids about how these large telescopes “see,” be sure to see our article on this topic at the NASA Space Place: <http://spaceplace.nasa.gov/telescope-mirrors/en/>

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



Galaxy cluster Abell S1063 (left) as imaged with the Hubble Space Telescope as part of the Frontier Fields program. The distorted images of the background galaxies are a consequence of the warped space due to Einstein's general relativity; the parallel field (right) shows no such effects. Image credit: NASA, ESA and Jennifer Lotz (STScI)

Minutes of the Skyscraper Meeting Friday, September 16 2016 - Joint meeting of the RI section of the American Chemical Society and Skyscrapers Inc.

Meeting started with an acknowledgement and welcome to the American Chemical Society members in attendance by President Steve Siok. President Siok then asked permission from Mrs. Siok to speak which was granted.

Astroassembly: Kathy Siok reported that many details for Astroassembly were all set. Speakers in place, banquet at the Community Center set. She has received a number of items from vendors and some members as donations to be used as raffle items or giveaways. This was followed by the usual begging, pleading and groveling for volunteers to help with the many various jobs during the day such as parking, the grill and so forth.

Star Party Requests / Updates: Francine Jackson reported that the recent star party provided for the River Bend Farm in Uxbridge was a success. Maybe a dozen members were in attendance with telescopes. There is currently a list of 5 requests for star parties. Among them are: September 24 in Thompson Ct., November 18 when a 4H group will come to the observatory, December 17 when a Cub Scout group will

come to the observatory and a request from a Home Schooling group for "whenever." More details to come.

Fall Workshops: There will be 6 different topics during the time period of October 15 to November 9. These will be on consecutive Saturdays starting at 6pm with observing after weather permitting. Exactly who, what and what date for each is being finalized. Details to come.

Center For Astrophysics talks: There is a series of monthly talks being presented at the CFA in Cambridge starting up again this Fall. These are heavily subscribed and

now sold out. It was suggested that we could live stream them into the meeting hall and anyone interested could attend as a sort of movie night type event. This was met with a lot of enthusiasm and President Siok will organize these.

Following an abbreviated business meeting, President Siok introduced our featured speaker Adam Sarafian. Steve had read about Adam's work in Science News and got in touch with Adam. Adam spoke on "Where Did Earth Get It's Oceans?"

Respectfully submitted, Steve Hubbard Secretary



Adam Sarafian



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