



the Skyscraper

vol. 42 no. 2
February 2015

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

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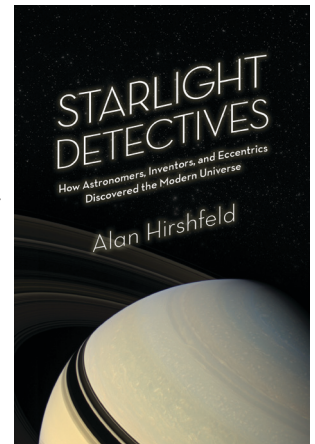
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Friday, February 6, 7:00pm at North Scituate Community House From Backyard to Mountaintop: The Adventures of History's Best Worst Telescope by Alan Hirshfeld

The 36-inch reflector of English amateur astronomer Andrew Common made its way from a London backyard to a Yorkshire estate and ultimately to a mountaintop observatory in California. This little-known telescope, built in 1879 and still operating today, revolutionized celestial photography and proved to 19th-century astronomers that the future of cosmic discovery lay in the camera, not the human eye.

Alan Hirshfeld, Professor of Physics at the University of Massachusetts Dartmouth and an Associate of the Harvard College Observatory, is the author of *Parallax: The Race to Measure the Cosmos*, *The Electric Life of Michael Faraday*, *Eureka Man: The Life and Legacy of Archimedes*, and most recently, *Starlight Detectives: How Astronomers, Inventors, and Eccentrics Discovered the Modern Universe*. He is a regular book reviewer for the *Wall Street Journal* and has contributed to *Sky & Telescope*, the *American Journal of Physics*, *BBC History Magazine*, and *American Scientist*. He has made radio and television appearances and lectures nationwide about science history and discovery.

Alan Hirshfeld will bring copies of his book *Starlight Detectives* for those who wish to buy it. Or if they bring a copy of the book, he'd be happy to sign it.



Phases of the Moon

Full Snow Moon
February 3 23:09

Last Quarter Moon
February 12 3:50

New Moon
February 18 23:47

First Quarter Moon
February 25 17:14



Heavy snowfall and pending maintenance will keep the observatory closed throughout February



President's Message

Bob Horton

Our February meeting marks the start of the process to choose new officers, members at large, and a trustee.

I have appointed Ed Haskell to chair the Nominating Committee. Ed, and other members of this committee, are now looking for members interested in taking on the responsibilities of running Skyscrapers in our next fiscal year, which begins in April. If you have been mulling over the idea of

running for any office, please contact Ed at haskell.ed@gmail.com.

At the March meeting, the Nominating Committee will be presenting their recommended slate of nominees for the elections, which will be held at the Annual Meeting in April.

Any member in good standing and over 18 years of age may run for office. After the Nominating Committee presents

their nominees, the floor will be open for anyone to be nominated, and seconded, by other members. Once all nominations have been made, the nomination process will be closed and the names of the candidates will appear on a ballot that will be sent to each member in good standing prior to the Annual Meeting.



Happy Lunar New Year!

Francine Jackson

Don't we all love celebrations? In fact, there always seem to be wonderful things that we can raise a glass to, or cheer for. Most recently, we celebrated the turn of the calendar to begin the New Year, 2015. But, for many varied cultures, the new year also comes at different times, and can, in fact, rely on the positions of our neighboring Moon.

Lunar New Year refers to the first day of a year in which the months are coordinated with the lunar cycle. As an example, the Chinese New Year for this year is celebrated Thursday, February 19th. This year, the celebratory animal is the Goat, the group

of persons believed to be honest, intimate, and easily moved by the misfortune of others. As there are 12 animals in the Chinese zodiacal circle, these attributes are for those born every twelve years beginning with 1919. Don't feel too bad if you belong to the year of the Goat; I happen to be a member of the Ox cycle.

Fifteen days after the first month of this traditional Chinese calendar is the Lantern Festival. This comes from over 2,000 year ago, when monks lit lanterns in temples to show respect to Buddha. However, it was also said to be a way for persons in rural areas to light torches to scare away beasts



CHINESE NEW YEAR 2015 YEAR OF THE GOAT (羊)

and insects to assure a good harvest. Nowadays, though, the festival is just a great time for revelry, where participants light torches, and sing and dance from morning till the following dawn. A true celebration, indeed, and all because of our Moon.



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 20** to Jim Hendrickson, 1 Sunflower Circle, North Providence, RI 02911 or e-mail to jim@distantgalaxy.com.

E-mail subscriptions

To receive The Skyscraper by e-mail, send e-mail with your name and address to jim@distantgalaxy.com. Note that you will no longer receive the newsletter by postal mail.

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Friday, February 13

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

University of Rhode Island Planetarium
Upper College Road
Kingston, RI

Friday, February 13th, 2015
6:00 and 7:00 P.M.

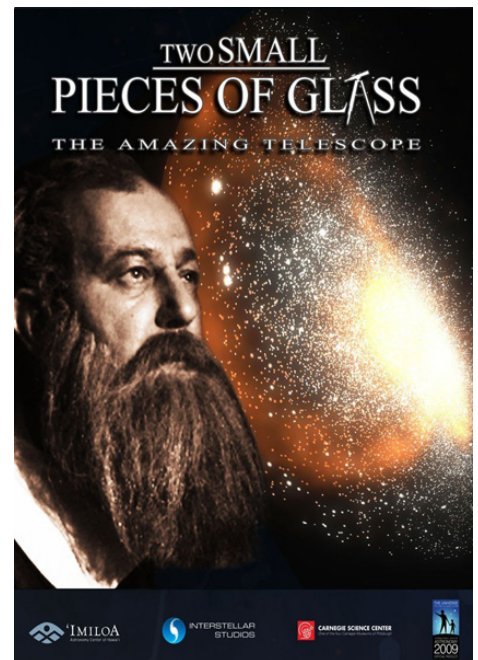
Contact: Francine Jackson: 401-527-5558

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, eventually, 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 more information, please call 401-527-5558.



The Sun, Moon & Planets in February

The Sun progresses further eastward and northward through the constellations of Capricornus and Aquarius during February. The days are getting longer with sunrise going from 7:00am on the first of the month to 6:24am on the 28, and sunset extending from 5:02pm to 5:36pm.

The Moon begins the month nearly full, with the Full Snow Moon occurring on the third.

This is the season to spot young Moons, with the angle of the ecliptic climbing steeply off of the western horizon after sunset, and we have a very interesting conjunction with Venus and Mars on the 20th.

Mercury is in the predawn sky all month reaching greatest elongation (27°) on the 24th. The waning gibbous Moon is 5° to the

left of Mercury on the 17th.

Venus is the dominant "Evening Star" in the west after sunset and climbs rapidly in elevation throughout the month. Look for Neptune just 50' to the right of Venus on the 1st and Mars on the 19th to 21st. The two day old Moon joins the pair for a striking view on the 20th. Venus exhibits a gibbous phase and grows slowly to 12 arcseconds by the end of the month.

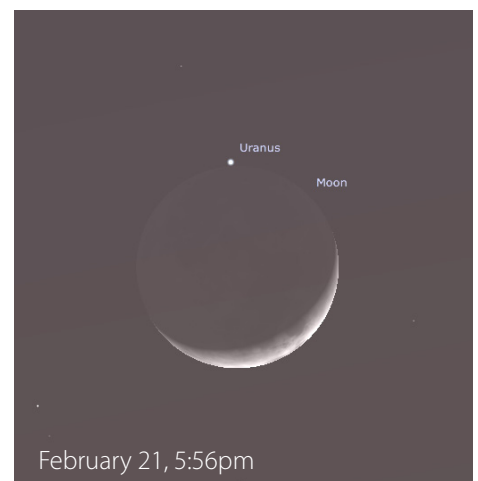
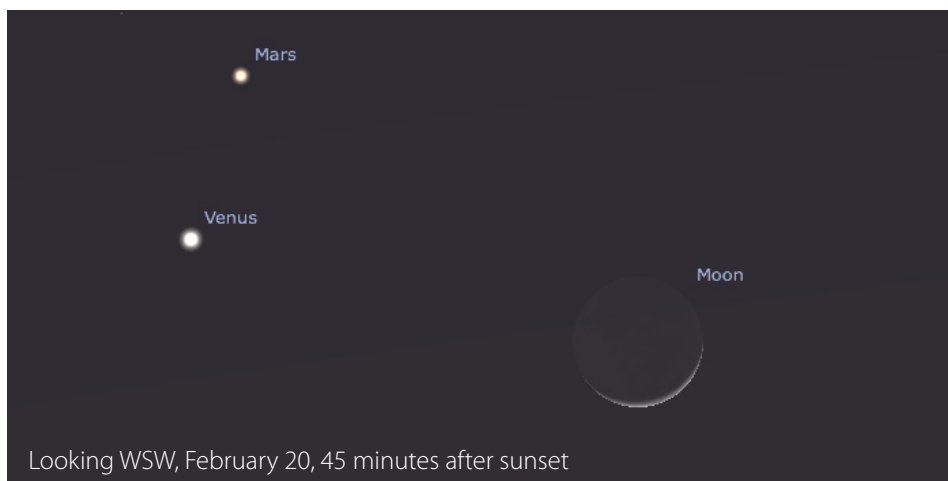
Jupiter reaches opposition on the 6th and shines at its brightest (-2.4) and biggest (45 arcseconds) all month. It rises with the Full Snow Moon on the 3rd and slowly progresses retrograde in the constellation Cancer, appearing to approach the Beehive cluster, throughout the month.

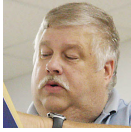
Saturn is now well-paced in the south-

east in the predawn sky, shining among the stars in the claws of Scorpion. The large, waning crescent Moon is nearby on the 13th. You should certainly notice that the angle of the ringplane has changed since last autumn, with the backside of the rings now appearing beyond the globe of the planet.

Uranus remains visible in the constellation Pisces throughout the month, but is getting lower and is rapidly leaving our evening sky. It is worth watching Uranus early in the evening of the 21st as the three day old Moon occults the distant ice giant just after sunset.

Neptune begins the month near Venus, but then fades into the evening twilight as the month progresses. It is in conjunction with the Sun on the 26th.





Observing the Winter Circle

Dave Huestis

I'm sure many of you can recognize a few of the major constellations in the night sky. Many of these star patterns have come down to us from the dawn of the earliest civilizations. Before light pollution began to diminish our view of the heavens, everyone could see these stellar pictograms.

Today we have a great understanding of that heavenly vault of stars. Though they look like they are just out of reach above our heads, these stars are many trillions of miles from our solar system.

While there are 88 officially recognized constellations that fill the skies surrounding the Earth, stargazers like to create their own stellar asterisms by combining stars from several star patterns.

I'm sure you've heard of the Summer Triangle. This shape is formed by connecting three bright stars—Deneb (in Cygnus), Vega (in Lyra), and Altair (in Aquila).

This triangle of stars is high overhead during mid-summer.

Well, the winter sky has its own special asterism, and this one is huge and includes a total of eight bright stars. It's called the Winter Circle or Winter Hexagon. I'll explain why you can get both shapes from the stars.

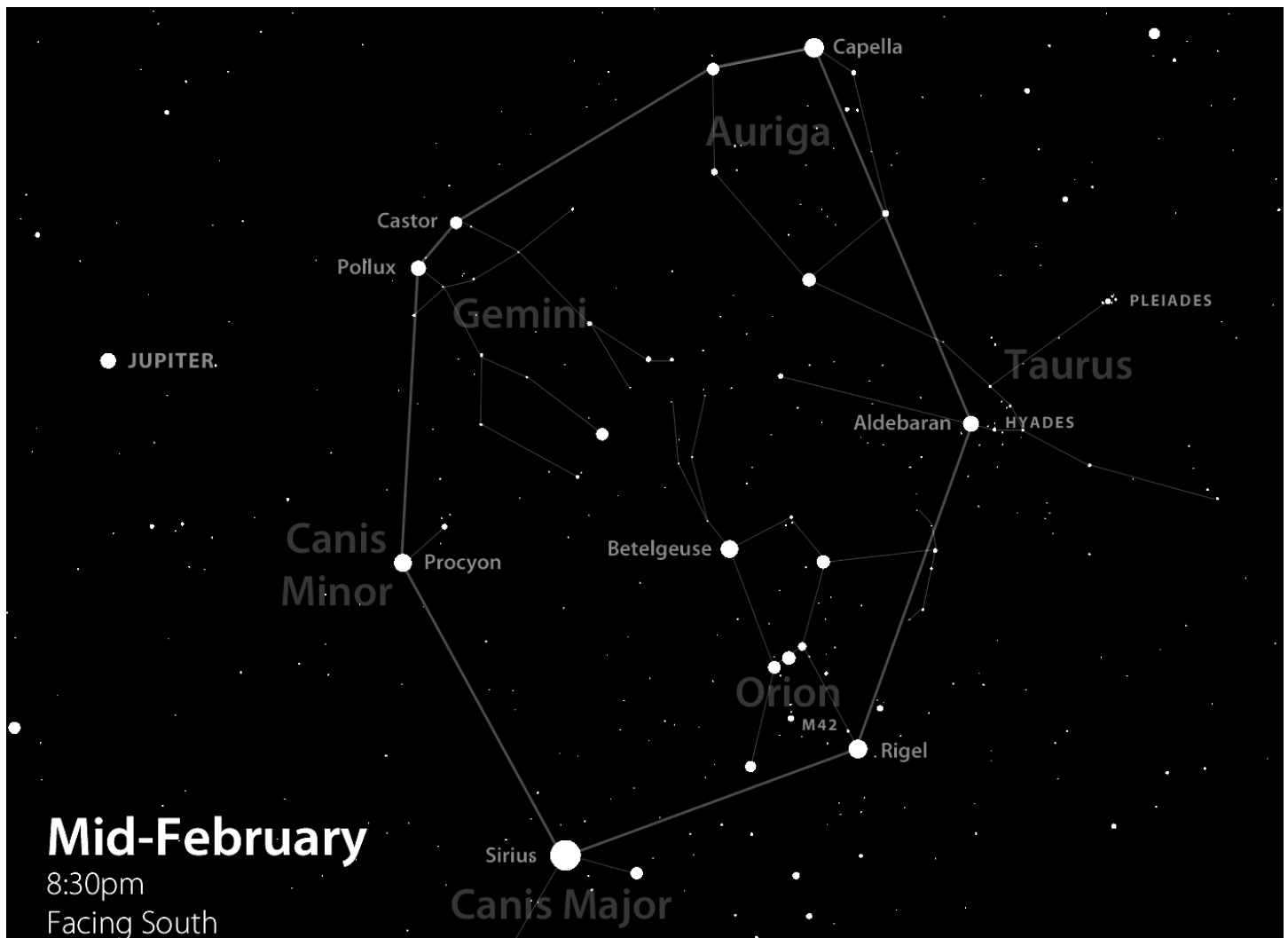
Please examine the basic star map accompanying this article. This chart represents the sky in mid-February at 8:30 p.m., looking from a point directly overhead towards the southern horizon. A circle, or actually an ellipse, can be drawn through each of the labeled stars. However, you can also draw a straight line from one star to the next and create a hexagon. Betelgeuse, though inside either pattern, is still considered part of the asterism.

The winter sky contains many of the brightest stars we can see from the Earth.

In fact, the Winter Circle contains seven of the 23 brightest. And these stars are but a few members of the estimated 400 billion plus stars that comprise our Milky Way Galaxy.

Before we examine each of the stars in the Winter Circle, let's review three important terms. First, the brightness of any celestial object is called its magnitude. The basic idea is that the more negative the magnitude, the brighter the object. The more positive the magnitude, the dimmer the object is. So the Sun is -26.74 , the Full Moon -12.92 , Venus -4.89 , Saturn approximately 0 , well known Polaris (the North Star) is magnitude $+2$, and the naked-eye limit with no light pollution is magnitude $+6$. Pluto is about $+13.65$. (Usually the plus sign (+) is assumed and not used, but I do so in this column for clarity.)

Second, a star's distance is measured in



light years. One light year is equal to just under six trillion miles. Third, the spectral classification of a star is categorized using the following letters: O, B, A, F, G, K, M, and often followed by additional numbers and letters to further refine the classification. "O" stars are the hottest while "M" stars are the coolest.

Let's start our tour of the Winter Circle with the brightest star we can see in the sky (besides the Sun of course) — Sirius. Sirius is in Canis Major, the Big Dog. Sirius shines at magnitude -1.44 and it is 8.7 light years away. Do the math and this fairly close neighbor to our Sun is 52.2 trillion miles from us. For you Rhode Islanders that's much farther than Woonsocket or Westerly! Sirius is a hot, blue-white star (spectral class A0) about 1.7 times the diameter of our Sun.

Next we move northward and clockwise in the sky to locate Procyon in Canis Minor, the Little Dog. Procyon is a white star (F5) shining at magnitude +0.40 and is 11 light years distant. It's about twice the diameter of our Sun. Moving farther northward we encounter the Gemini twins, Pollux and Castor. Pollux is 34 light years distant, while Castor is 18 light years farther away at 52. Pollux is a cool, orange giant (K0) ten times the Sun's diameter, while Castor is a hot, blue-white star (A1) only twice the diameter of the Sun. Pollux and Castor shine at +1.16 and +1.93 magnitude respectively.

Now we swing up and over to a constellation almost directly overhead — Auriga, where we find +1.93 magnitude Capella. While Capella (G6) is a class "G"-type yellow star like the Sun (G2), it has three times more mass and is just over seven times the Sun's diameter. Next we proceed south to encounter the orange giant (K5) Aldebaran in Taurus. Aldebaran represents the bull's eye in the star pattern known as the Hyades star cluster (shaped like a "V"). Aldebaran, 65 light years away, is a cool star which has expanded to be just over 44 times the diameter of the Sun with only 2.5 times our Sun's mass.

Continue to swing southward in the sky until we arrive at the bottom right star representing Orion's left foot. (Please note: Orion is facing us.) This star is +0.18 magnitude Rigel, a blue supergiant (B8) 800 light years away — the most distant of the Winter Circle stars. Rigel is 62 times the diameter of our Sun and contains 17 times more mass. We now complete the tour of the Winter Circle by swinging back to



Sirius.

But wait. No, I didn't forget about Betelgeuse. Betelgeuse is the red supergiant (M2) star that marks the top right shoulder of Orion. It shines at magnitude +0.45 and resides at a distance of 520 light years. Betelgeuse is also a very large star, measuring in at a conservative 950 solar diameters. If you replaced our Sun with Betelgeuse it would extend out to the asteroid belt between Mars and Jupiter.

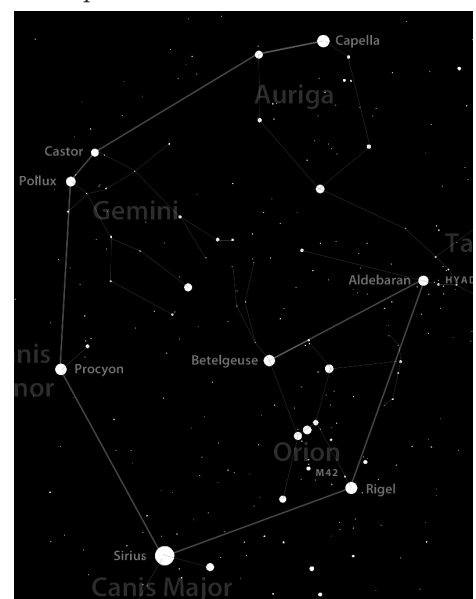
As you can see by this small sampling of stars that comprise the Winter Circle, stars are quite a lot like people. They are all different, but their differences make them unique and important.

The next time you have an opportunity to observe the Winter Circle, you will have a better understanding and appreciation of the scale and diversity of our stellar neighbors in this region of the Milky Way Galaxy.

Keep your eyes to the skies.

PS. Want to identify more constellations on your own? Visit Uncle Al's Sky Wheels on the Internet (<http://www.lhs.berkeley.edu/StarClock/skywheel.html>). From this website you can download templates to

assemble your own planisphere/starwheel. Instructions for assembly and use are included. I suggest you print on card stock paper. Then go outdoors on a clear night and explore the heavens.



Francine Jackson, not wanting to leave Betelgeuse out of our favorite winter asterism, points out that you can include it in the "Heavenly G" asterism as shown above.



Double star iota Cancri by Jim Hendrickson

Double star h 3945 in Canis Major ("Winter Albireo") by Jim Hendrickson

Venus/Mercury Conjunction
1/10/2015 @ 5:15pm by Lloyd Merrill

A beautiful twilight sky over Providence on a cold winter's night. The two "stars" are Venus and Mercury. January 7 photo by Bob Horton



Congratulations to Skyscrapers Member and Past President Glenn Jackson for being recently voted into the Springfield Telescope Makers as an Associate Member!

Glenn is seen here working on his 14.5" mirror at Dick Parker's 2015 mirror workshop.





Planetary Nebula in Camelopardalis NGC 1501

Glenn Chaple

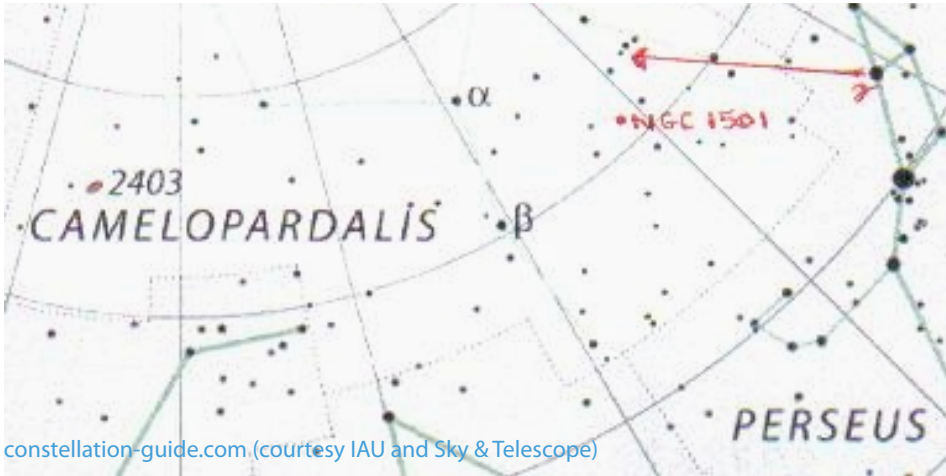
While Go-to technology has gained popularity with backyard astronomers who like to key their telescopes on a sky object with the push of a button, I prefer the no-frills star-hop mode of cosmic travel. Star-hopping lets me see enjoy celestial scenery I'd miss by traveling Go-to. I'll demonstrate my point with a star-hop to the planetary nebula NGC 1501 in Camelopardalis.

Camelopardalis isn't very kind to star-hoppers. This sprawling north circumpolar constellation contains just four stars brighter than 5th magnitude. A star-hop to any sky destination in Camelopardalis usually begins with a bright star in an adjacent constellation. To find NGC 1501, we begin at gamma (γ) Persei and trace a 12° path between a pair of 4th magnitude stars

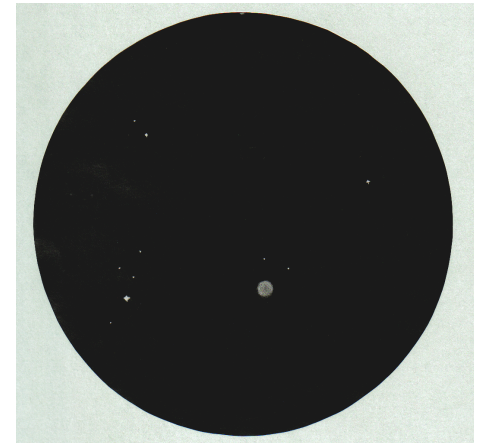
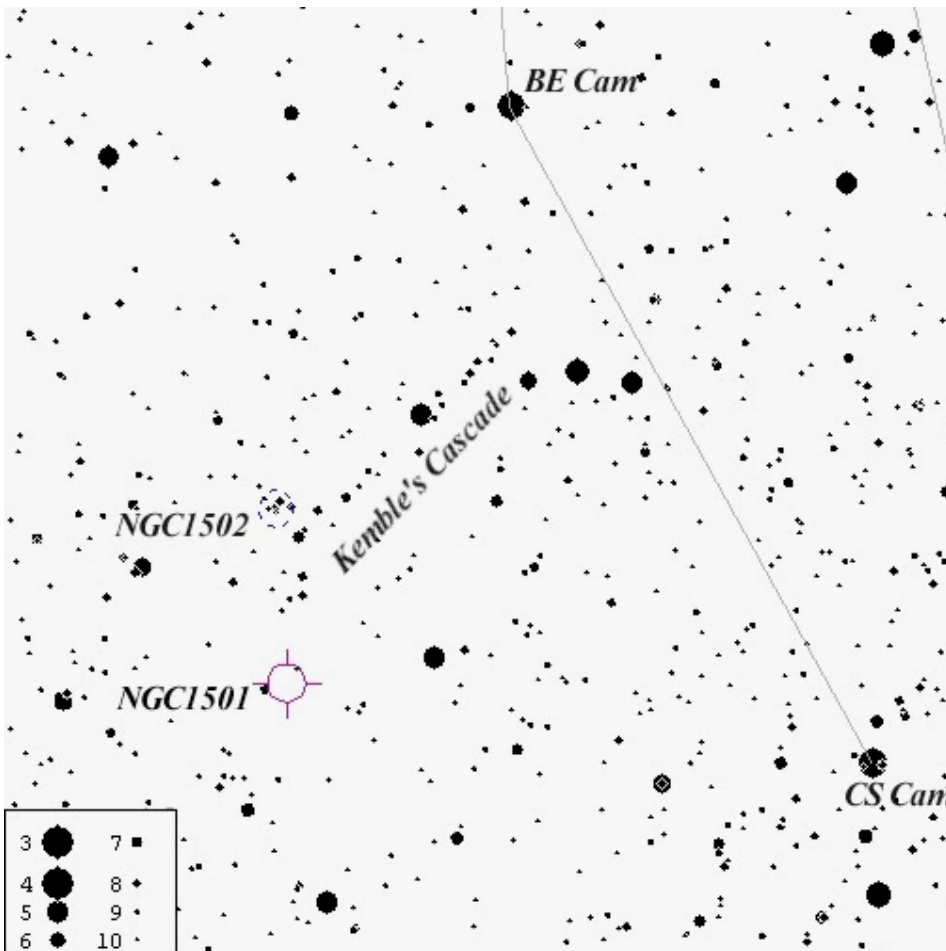
to Kemble's Cascade (refer to the finder charts below).

Kemble's Cascade is a stunning 2½° chain comprised of some 20 magnitude 7 to 9 stars. At its southwest end is the pretty open cluster NGC 1502, punctuated at the center with the eye-pleasing 7th magnitude twins that make up the double star Struve 485. A 1½° push south of NGC 1502 brings us to NGC 1501. Think of it – if we'd traveled to NGC 1501 via Go-to technology, we'd have missed three delightful celestial showpieces!

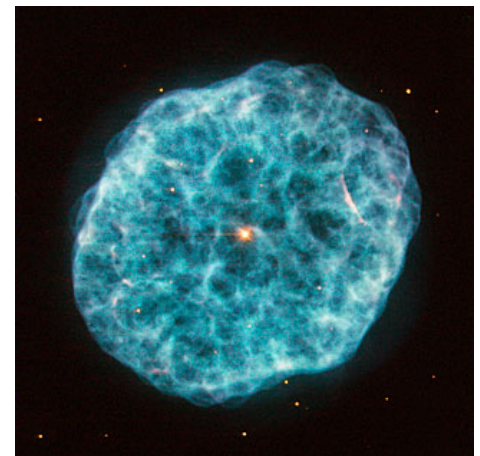
NGC 1501 is a magnitude 11.5 planetary nebula located about 5000 light-years away. Its slightly oval disk, just under an arc-minute across, can be glimpsed (barely) in a 3-inch scope, but twice that aperture will be needed for a definite sighting. With a 12-inch scope and dark-sky conditions, you should be able to make out the nebula's bluish hue and magnitude 14.5 central star.



constellation-guide.com (courtesy IAU and Sky & Telescope)



NGC 1501 (13.1-inch f/4.5 reflector at 166X)
Sketch by author



ESA/Hubble and NASA



Minor mergers have massive consequences for black holes

By Dr. Ethan Siegel

When you think of our sun, the nearest star to our world, you think of an isolated entity, with more than four light years separating it from its next nearest neighbor. But it wasn't always so: billions of years ago, when our sun was first created, it very likely formed in concert with thousands of other stars, when a giant molecular cloud containing perhaps a million times the mass of our solar system collapsed. While the vast majority of stars that the universe forms—some ninety-five percent—are the mass of our sun or smaller, a rare but significant fraction are ultra-massive, containing tens or even hundreds of times the mass our star contains. When these stars run out of fuel in their cores, they explode in a fantastic Type II supernova, where the star's core collapses. In the most massive cases, this forms a black hole.

Over time, many generations of stars—and hence, many black holes—form, with the majority eventually migrating towards the centers of their host galaxies and merg-

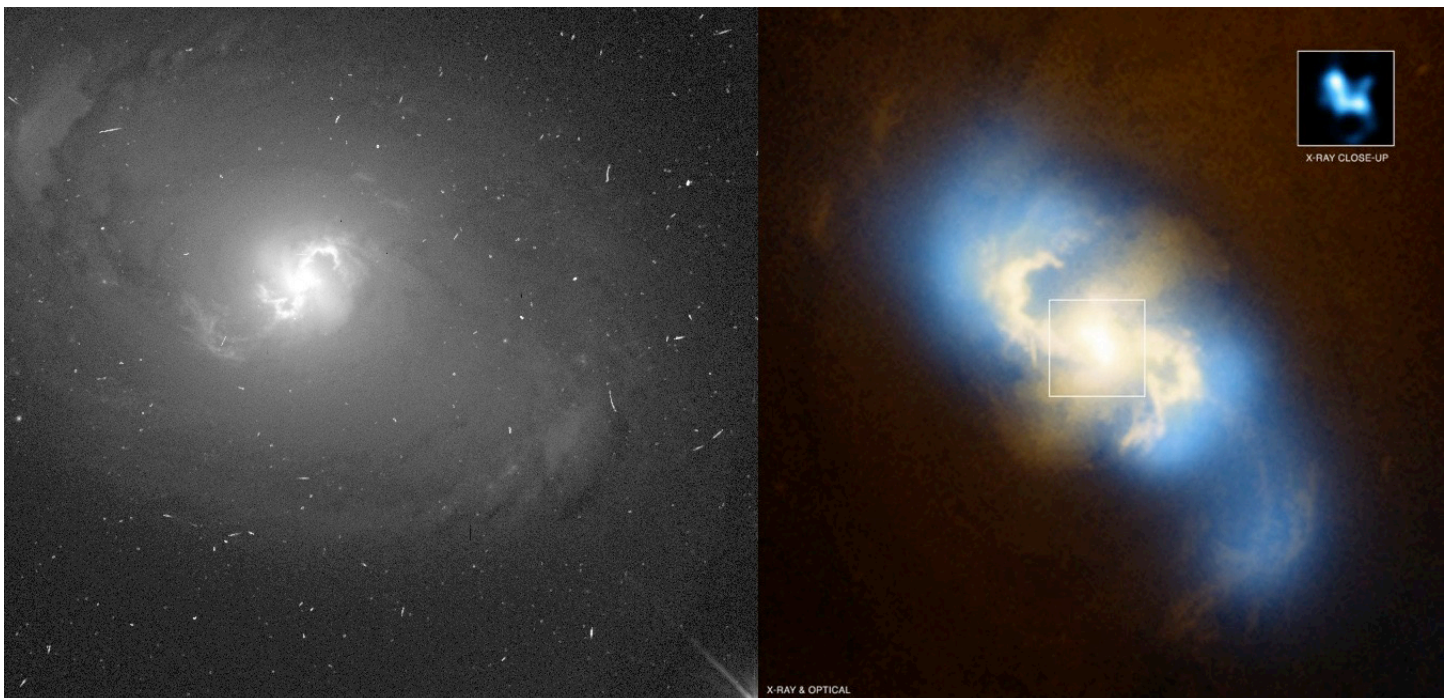
ing together. Our own galaxy, the Milky Way, houses a supermassive black hole that weighs in at about four million solar masses, while our big sister, Andromeda, has one nearly twenty times as massive. But even relatively isolated galaxies didn't simply form from the monolithic collapse of an isolated clump of matter, but by hierarchical mergers of smaller galaxies over tremendous timescales. If galaxies with large amounts of stars all have black holes at their centers, then we should be able to see some fraction of Milky Way-sized galaxies with not just one, but multiple supermassive black holes at their center!

It was only in the early 2000s that NASA's Chandra X-ray Observatory was able to find the first binary supermassive black hole in a galaxy, and that was in an ultra-luminous galaxy with a double core. Many other examples were discovered since, but for a decade they were all in ultra-massive, active galaxies. That all changed in 2011, with the discovery of two active, mas-

sive black holes at the center of the regular spiral galaxy NGC 3393, a galaxy that must have undergone only minor mergers no less than a billion years ago, where the black hole pair is separated by only 490 light years! It's only in the cores of active, X-ray emitting galaxies that we can detect binary black holes like this. Examples like NGC 3393 and IC 4970 are not only confirming our picture of galaxy growth and formation, but are teaching us that supermassive relics from ancient, minor mergers might persist as standalone entities for longer than we ever thought!

Check out some cool images and artist reconstructions of black holes from Chandra: <http://chandra.harvard.edu/photo/category/blackholes.html>

Kids can learn all about Black Holes from this cool animation at NASA's Space Place: <http://spaceplace.nasa.gov/black-holes>.



NGC 3393 in the optical (L) by M. Malkan (UCLA), HST, NASA (L); NGC 3393 in the X-ray and optical (R), composite by NASA / CXC / SAO / G. Fabbiano et al. (X-ray) and NASA/STScI (optical).



Secretary

Tina Huestis

Skyscrapers January Meeting Meeting Minutes 1/10/15

President Robert Horton called the Skyscrapers' January meeting to order at 7:10 p.m.

Bob welcomed everyone to the business meeting.

President, Robert Horton: Bob informed the group that the next meeting of the Society's Executive Committee will be held on January 24 at 2:00 p.m. at Seagrave, weather permitting. He extended an invitation to any member who is interested to come and attend this Executive Committee meeting. Bob explained that it is at these meetings that the business of the organization is discussed. He welcomes input from members on subjects such as speakers, long-range planning, topics for workshops, and Astro-Assembly, to name a few. Bob noted that the annual elections will be held in April and that a Nominating Committee has been formed with Ed Haskell as its Chair. If you are interested in running for an office, Bob encourages that you attend Board meetings to see first-hand the roles and responsibilities of these positions.

Treasurer, Linda Bergemann: Linda

noted that new members Chris Martel and Jim & Pamela Wallace were not present; therefore they will be voted on at the next meeting in which they are in attendance.

Public Affairs Spokesperson, Francine Jackson: Francine said that she brought several discs on NASA's New Horizons mission to Pluto and, if you are interested, to take one. • Francine informed the membership that NASA is giving away Space Shuttle tiles through its "Historic Artifacts" program, and she will pursue obtaining some on behalf of Skyscrapers. • Francine reported on the NASA "Volunteer Disc Detectives" milestone of one million classifications of possible planetary habitats. NASA has sponsored a website to crowd source analysis of data from their Wide-field Infrared Survey Explorer (WISE) mission. This work by citizen scientists is helping provide a crucial set of targets for future planet-hunting missions. If you are interested, the site has a video that explains more. • Bob noted that there is an opportunity to submit observation proposals for the Hubble Space Telescope (HST). The deadline for solicitation of proposals is mid April. Participation is open to nonprofits. He and Francine will investigate further. • Bob informed the membership that the February issue of Sky & Telescope magazine featured a story on H.P. Lovecraft and his connection with Brown University's Ladd Observatory. Bob reminded members that Ladd is open on every clear Tuesday night and is located on the corner of Hope and Doyle Streets in Providence.



Treasurer

Linda Bergemann

Cash Flow YTD as of January 26, 2015
(4/1/14 through 01/26/15)

INFLOWS

AstroAssembly	
Banquet	\$1,475.00
Centennial Mugs	\$145.00
Grill	\$397.25
Raffle	\$539.00
Registration	\$1,755.00
TOTAL AstroAssembly	\$4,311.25
Donation	
Misc Donation	\$873.37
Refreshment Donation	\$44.00
TOTAL Donation	\$917.37
Dues	
Contributing	\$35.95
Family	\$120.00
Junior	\$15.00
Regular	\$790.55
Senior	\$297.90
TOTAL Dues	\$1,259.40
EAGLE Project In	\$970.00
Misc Income	
Book Income	\$99.00
Interest Inc	\$27.92
Sale of Items	\$660.00
TOTAL Misc Income	\$786.92
Star Party Donations	\$533.00
Subscription Income	
Astronomy	\$68.00
Sky & Telescope	\$65.90
TOTAL Subscription Income	\$133.90
TOTAL INFLOWS	\$8,911.84

OUTFLOWS

Astro Assem Exp	
Banquet	
Caterer	\$1,121.00
Reception	\$108.30
TOTAL Banquet	\$1,229.30
Centennial Postcard	\$85.60
Grill	\$180.37
Refreshments	
Friday PM	\$7.98
Saturday AM	\$2.02
TOTAL Refreshments	\$10.00
Speaker Fee	\$300.00
Tent Rental	\$720.00
TOTAL Astro Assem Exp	\$2,525.27
Contingency	
Speakers Fees	\$200.00
TOTAL Contingency	\$200.00
Corporation, State Fee	\$20.00
EAGLE Project Out	\$970.00
Postage and Delivery	\$24.15
Presidential Fund	\$40.00
Printing and Reproduction	\$10.70
Property Insurance	\$2,386.00
Refreshment Expense	\$131.99
Subscription Payments	
Astronomy	\$68.00
Sky & Telescope	\$65.90
TOTAL Subscription Payments	\$133.90
Trustee Expense	
Capital Equipment	\$222.33
Property Maintenance	\$3,298.65
TOTAL Trustee Expense	\$3,520.98
Utilities	
Electric	\$188.09
Porta-John	\$693.00
Propane	\$80.25
TOTAL Utilities	\$961.34
TOTAL OUTFLOWS	\$10,924.33
OVERALL TOTAL	(2012.49)

Cash and Bank Accounts - As of 01/26/15

Capital One Bank	\$12,366.39
Cash	\$43.00
Checking	\$10,166.39
PayPal	\$0.00
TOTAL Bank Accounts	\$22,575.78



Rich Nugent



interesting and dedicated attendees in such a short period of time! Many thanks for all the work you do, and for including us in the Observatory Centennial. It was so nice to meet you and Sharon and Mark. Have a wonderful holiday!

*Sincerely,
Linda & Jon Ventres*

LR
Illustration by Gordon Lees
Courtesy of Image Source

First Vice President, Kathy Siok: Kathy reported that next month's program will be held at the North Scituate Community Center on Friday, February 6, and will feature Dr. Alan Hirshfeld. Dr. Hirshfeld is a

professor at the University of Massachusetts at Dartmouth and is also the author of *Starlight Detectives*. She reminds everyone to bring their copies of his book to the meeting and the speaker will sign them. • She noted that Friday, March 6, is the upcoming date of the following Skyscrapers' monthly meeting, which will be held at the Maribel Cormack Planetarium at the Roger Williams Park Natural History Museum.

Trustee, Jim Crawford: Jim noted that there was no Trustee report. However, he did observe coyote tracks in the snow on the grounds at Seagrave.

For the good of the organization: Francine remarked that on Friday, February 13, the URI planetarium show be on "Two Small Pieces of Glass." • Tina Huestis read the Christmas card sent by Seagrave relative Linda and Jon Ventres sent to Skyscrapers thanking everyone for their hospitality at AstroAssembly.

The meeting adjourned at 7:20. Submit-

ted by Tina Huestis, Secretary.

Steve Hubbard introduced the evening program presenter, Rich Nugent.

Speaker, Rich Nugent presented his talk "Observing Earth's Satellites." Rich Nugent opened with the recollection of his first observation at age 7 of watching Echo with his father and little brother. Rich provided a historic context of the first satellites — Sputnik, Explorer, Vanguard — as well as Dr. Fred Whipple's "Project Moonwatch". Fast forward to today, Rich explained how lighting plays a big part in observing satellites. He instructed that the best time for observing is right after sunset or before sunrise. He informed us that in the winter, it is rarer to see satellites and that summer is the best season. Rich mentioned the following websites/resources to get started in observing satellites and also the reentries of satellites: www.heavensabove.com; www.calsky.com; www.space.com; www.spaceflightnow.com; and www.aerospace.org.



A Night at Foxwoods

Francine Jackson

What?! A review of spending a night in one of the country's premier gambling facilities? Not exactly. For some reason, probably known only to him, **Neil DeGrasse Tyson** was booked into probably one of the largest theaters in the building - the old MGM Grand. And, with a capacity of about 4,000, the place was almost packed.

The program began 15 minutes late, with a couple walking out onstage - his parents, who introduced him. From then on, it was nonstop Neil, who regaled us with everything from the definition of science and science research, to his being blamed for the demotion of Pluto (his words: Get over it). The varied topics were all targeted to the general audience, as there were people of all ages, none of whom seemed to become bored throughout the two hours he lectured.

Afterwards, he allowed some questions - "Just a few" - which turned out to be another hour's time. Many of them, of course, were preceded with comments such as, "You're really wonderful," "We've read all your books," and the like, but it appeared many of those in the audience were teachers looking for inspiration on making science education more palatable. Included among the questioners was a young

girl named Julie that we had seen just the night before at the Center for Astrophysics Observatory Night lecture, who, according to her parents, had wanted to be an astrophysicist since she was four. Neil was struck by her t-shirt, a beautiful nebular pattern, to the point where he called her up to him, and lifted her on stage for the audience to admire. She then went back to the microphone and asked him one of the most rigorous questions of the night.

Between his monologue and questions, Neil was on stage for about three hours, receiving thunderous applause on his final farewell. All-in-all, it was worth the trip. Which brings up the reason for this note: Neil is coming to Providence in September. It might be a nice night for a group of Skyscrapers to spend at PPAC with the world's leading (and, according to the polls, sexiest)

astrophysicist. There is always a chance that tickets may go rather quickly, so if you think it might be fun, let's plan a night together.



**An Evening with
Neil deGrasse Tyson**
Thursday, September 24
at 7:30PM

<http://www.ppacri.org/events/detail/an-evening-with-neil-degrasse-tyson>

Comet Lovejoy Zips Through The Winter Sky

Comet C/2014 Q2 Lovejoy first entered our skies in late December 2014, appearing in the constellation Puppis, below Canis Major. It then made its way through Columba and up into Eridanus in early January. Making rapid progress up into Taurus, it became naked-eye visible when it was 0.45 AU from Earth.

Jim Hendrickson spotted the comet rising over Seagrave Observatory on December 27 in the constellation Columba, seen here to the right of Sirius and below Lepus. The comet was prominently visible in a 50mm finderscope but not quite naked-eye visible.

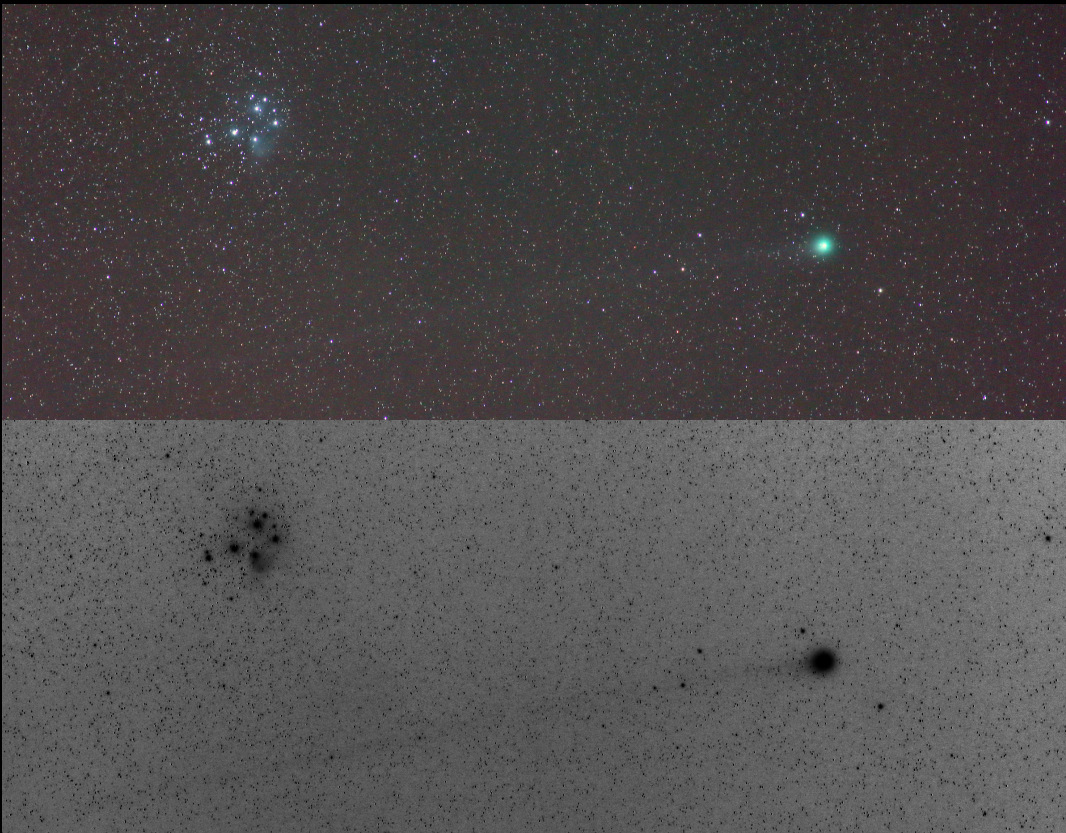
Jim Hendrickson, January 2: Here's a shot of the comet's nucleus I got through the 12" at Seagrave on Friday night, which was moonlit and hazy:

Dave Huestis, January 7: Just went out and caught Comet Lovejoy. Easy to see with naked-eye here in Pascoag. Estimate mag at 4.2 to 4.5. Looks like a large globular cluster with binoculars. No evidence of tail in 7x50's.

Too cold to get scope out, though I was tempted. 9.7 degrees F out there with blustery wind. Just too darn cold to stay out more than a couple of minutes.



Lloyd Merrill, January 8: Comet Lovejoy C/2014 Q2; 20 second image taken with Lodestar X2 guide camera.



Jim Hendrickson, January 17: A few people showed up for tonight's public night. While Jim Crawford and Kent Cameron showed visitors the Orion Nebula with the 12" Meade, I helped a family who brought a 4.5" dobsonian locate the comet, which was located near the Pleiades and naked-eye visible tonight. At the end of the session, I took a few photos of the comet and stacked them. The negative shows the tail extending several degrees and off the frame.



Conrad Cardano, January 19: I used my ES 102 refractor + Canon EOS T1i + field flattener. The photo is a composite of 30 x 20sec processed with "Deep Sky" software.

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