the Skyscraper

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June 2024

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

In This Issue:

Seagrave Memorial Observatory Open Nights
Jun1 1, 8, 15, 22, 29
@ 9pm

June Meeting

Saturday, June 1 @ 7:00pm EDT at Seagrave Memorial Observatory

In-person and on Zoom (Contact Linda Bergemann (lbergemann@aol.com) for the Zoom link.

6 PM: Socializing
7 PM: Business Meeting & Presentation

Facilities will open at 6 PM for socializing before the meeting. At 7 PM, we will begin our business meeting, followed by our speaker.

BUSINESS
Reports
For the Good of the Organization

TOPIC: "How and Why AI Changed My Imaging Workflow"

SPEAKER: Kevin Boucher, Aldrich Astronomical Society

Since the advent of AI and how it was applied to Image manipulation, you had to know some smart individual was going to come along and apply Machine Learning to Astrophotography. Along comes Russell Croman of RC Astro who initially came out with his amazing StarXterminator program that separates Stars from your Deep Sky Target (Galaxy/Nebula/etc..). Soon to follow RC Astro came out with two more products called NoiseXterminator and BlurXterminator. All these products run as Processes within the popular Image Processing Tool PixInsight. As a result, these tools have completely changed my Imaging Workflow for the better. See why and how I changed my Workflow and the reason it drastically improved my image quality.

Kevin has been retired for almost 10 years coming this November. He was a software consultant for 30+ years traveling many places around the country and the world developing new software systems for companies. For a couple years he traveled to many of the largest cities in the country on a paid speaking tour on IT related subjects.

Kevin got into astronomy on his 10th wedding anniversary (over 25 years ago) when he and his wife traveled to Sedona Arizona to a resort and an amateur astronomer was positioned on the roof of the restaurant at the resort every evening. He couldn't get enough of it. Soon thereafter, he bought his first telescope and a few years after that started in astrophotography with the first mass produced amateur CCD camera from MEADE called the Deep Sky Imager. He has been trying to improve his astrophotography hobby over the last 25 years as the technology changes.

President's Message

by Linda Bergemann

It doesn't seem possible that another month has passed. Here we are at the start of the summer, and many things are happening.

Last Thursday morning, I arrived at Seagrave, as planned, to meet with Dave Huestis. Much to my surprise, the place was abuzz with workers. Bob Janus was mowing the grass around the perimeter of the property with a walking mower; Jim Crawford was atop a ladder working to replace the corner boards on the meeting hall; and Rick Lynch was preparing to mow the grass astride the rider mower.

Dave and I completed the move of our audio and video equipment to the left front of the meeting hall. This relocation, which began last fall, made space available in the right front cabinet for more library books that Dave has kindly stored in his home. Once the library reorganization is complete, the Lending Library will be open during each monthly meeting for browsing by our members.

While all of this was going on, in came Steve Siok and Jim Brenek, delivering our "new", used John Deere lawn tractor. With a new battery and full of gas, it was ready to go; except for the rain that began to fall.

On your next visit, you may notice that many of the astronomical posters and artwork are missing from the walls of the meeting hall. We are preparing to paint some of the interior walls in preparation for the addition of a gallery wall to display select astrophotography. Some of the items removed from the walls will be returned for display, other items will be archived.

Oh, I almost forgot. Last Saturday night, the 16-inch Meade was awakened from its long, long winter's nap, and put into service for our Public Open Night by the team of Matt White, Mark Munkacsy and Steve Siok.

My thanks go out to the large number of people who work to make the observatory and its equipment available for our use. We have a broad assortment of astronomical equipment just waiting to be put into service. If you would like to be trained to operate any of our telescopes so you can make use of it, please contact me or one of the trustees.

Until next month...

Warm wishes and clear skies, Linda

Upcoming Presentations

July 6
Member Presentations: Home Observatories

August 10
TBD

September 7
Mario Motta
Design and Construction of a 32" Telescope

October 4-5
AstroAssembly

November 2
Steve Laflamme
Adventures with Space Junk

December 14
Steve Hubbard
Alaskan Aurora Report

Skyscrapers Presentations on YouTube

Many of our recent monthly presentations on Zoom have been recorded and published, with permission, on the Skyscrapers YouTube channel. Go to the URL below to view recent presentations.

https://www.youtube.com/c/SeagraveObservatorySkyscrapersInc

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 **June 15** to Jim Hendrickson at hendrickson.jim@gmail.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.

I Remember Pat Armitage

by Francine Jackson

Pat Armitage was a force in Skyscrapers for many years. My first meeting with her was at a total solar eclipse site in Halifax, Nova Scotia, in 1972, where she, her husband at the time, Steve and Kathy Siok, and other members traveled together in a mobile home.

Pat taught in the Scituate School system for many years, including being Science Department Head for much of her time.

In addition, Pat was involved with the Blackstone Valley Historical Society, which had been founded by her parents, Richard and Annie Buckley. While she was president, I went to a talk at the Society's North Gate home, and she made sure I became both a member, and a part of the Board, of which I still serve.

Much of her later time, she always carried news clippings of her granddaughters, and their athletic accomplishments. She could not have been a more proud grandmother.

The saddest part of her passing is that her family had begun preparations for her 80th birthday celebration, to be held at the Historical Society building in mid June. Her sudden passing is a shock to all who knew her.

Book Review

The Dawn of a Mindful Universe: A Manifesto for Humanity's Future

by Marcelo Gleiser, New York: HarperCollins, 2023, ISBN 978-0-06-305687-9, hardbound, $29.99 US

Reviewed by Francine Jackson

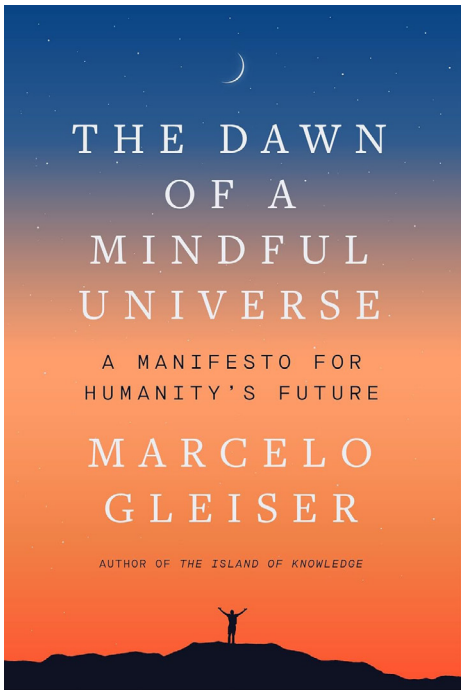
It isn't often that an author dedicates his book to "Earth, the planet that makes our story possible," but on finishing this, the reason becomes very clear.

At first, it seemed to be another historical piece, with some tidbits that aren't normally described, such as a church canon coming to visit an aging astronomer to deliver his life's work, a book thirty years in the making: *On the Revolutions of the Heavenly Spheres*, by Nicholas Copernicus, but with an addendum, a preface almost mocking the book as a work of fiction!

The author introduces himself as a person who was always fascinated with the concept of Nature, collecting plants and animals in his grandparents' backyard, until, upon their passing, the property was sold, and the new owners clear-cut the land. He then apparently realized the importance of science and purpose, and went on to earn his Ph.D. in physics and astronomy, following the progression of the early thinkers and their work in changing the universe into what it is today: From Galileo to Newton, Kepler to Le Verrier, and so many others. He lauded Christian Doppler and the magic of waves, both sound and light, and how they showed him the magic of star motion.

Halfway through the book, the author introduces the concept of life; how it is believed to have begun here on Earth, and could this same concept occur elsewhere. He even compares life to the "lives" of such entities as fire, hurricanes, and stars, and states that, even though we do refer to them as having life, there is so much more to us than them.

Finally, the reader comes to apparently the real reason this book was written: the author's musing on how and what we should be doing to preserve the only planet we have. He acknowledges that all living beings – plants, as well as animals – have a need to survive, but no one but humans can do what has been done to our planet, and how we can give back to it to allow it to survive as well. He has given the reader what he believes are values necessary to "change the current course of civilization." Can they be followed? He believes they must be, to keep our planet for the coming civilizations. After reading this book, and we hope you do, decide for yourself.



Skylights: June 2024

by Jim Hendrickson

Our **earliest sunrise** of the year occurs at 5:10am EDT on the 14th, and our **latest sunset** is at 8:24pm EDT on the 26th.

Solstice occurs at 4:51pm EDT on the 20th, when the Sun will be at its most northerly extent. Early during the following morning, the Sun crosses the galactic equator and enters Gemini.

June begins with the **Moon** in its waning crescent phase, passing 2.9° east of Neptune on the 1st.

On its way to new phase on the 6th, the waning crescent Moon passes 6.0° northwest of Mars on the 3rd. On the 5th, the 28-day, 1.6% illuminated crescent will be 3.6° northwest of Jupiter, and 4.6° west-northwest of Mercury. On the same morning, look for the Pleiades cluster just 0.5° north of the Moon.

New Moon occurs at 8:38am on the 6th, marking the beginning of Lunation 1255.

The stars of late winter and early spring are still with us in June, and they are notably visited by the waxing crescent Moon during the second week of the month.

On the 8th, the beautiful waxing crescent Moon lies 4° west-southwest of Pollux, and forms a right angle with the twin stars Pollux and Castor of Gemini until it sets at 10:54pm EDT. During the following evening, see the Moon 5.0° north west of M44, the Beehive Cluster, in Cancer, and on the 11th, it passes 2.7° north of Regulus, in Leo.

First quarter Moon occurs in Libra at 1:18am on the 14th. Early in the evening of the 16th, the waxing gibbous Moon appears 3.3° east-southeast of Spica, in Virgo.

The waxing gibbous Moon is near Antares, the red giant star in Scorpius, on the 20th, but unlike last month's three arcminute separation, this month we miss the close approach, as the pair sets when they are separated by a full 3°.

The Moon is full at 9:21pm on the 21st. This full Moon, the **Strawberry Moon**, is the most southerly full Moon of the year, transiting at 12:57am EDT on the 22nd, at just 19° above the southern horizon.

The waning gibbous Moon is 6.0° southwest of Saturn just before morning twilight on the 27th. Although the sky brightens, you may still be able to see Saturn through a telescope well into daylight. At 10:00am, just over an hour before moonset, Saturn will be just 1.2° northeast (oriented at the 12 o-clock position) of the Moon. Use medium to high magnification on the largest telescope you have available, and try an orange or red filter to improve contrast.

After passing just 0.3° south of Neptune early on the 28th, the Moon reaches its last quarter phase, in Cetus, at 5:53pm EDT.

After a less than favorable morning apparition, **Mercury** passes superior conjunction on the 16th, and enters the evening sky.

Venus is at superior conjunction on the 4th. This isn't just a conjunction, but an occultation, as Venus passed directly behind the Sun, beginning at about 2:00pm EDT on the 3rd, and remaining occulted for the next 45 hours, unlike Venus transits, which take around 6-7 hours to pass in front of the Sun. Also unlike transits, occultations occur much more frequently, with the last occurrence in June 2016, and the next one in June 2032, whereas the last transit occurred in 2012, and there will not be another one until 2117.

After conjunction, Venus returns to the evening sky, but will be too close to the Sun and difficult to observe until July.

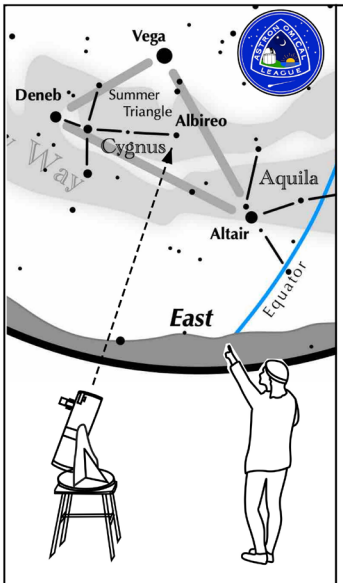
At the beginning of June, **Mars** rises at about 3:00am EDT in Pisces. On the 3rd, the 26-day waning crescent Moon lies 6° to the northeast. The Red Planet crosses into Aries on the 9th, and climbs more northerly along the ecliptic as the momth progresses. By month's end, Mars rises just after 2:00am EDT, and the planet's tiny 4.3 arcsecond globe lies at a distance of 1.739 au.

Jupiter, which passed through superior conjunction in mid-May, won't be in favorable viewing position until mid-June, when it will rise about an hour before sunrise, and be positioned distinctly beneath the Pleiades cluster in Taurus, and 5.6° above the constellation's brightest star, Aldebaran. For an observing challenge, Jupiter pairs with Mercury

Events in June

1	03:00	Moon 2.9° E of Neptune
2	11:00	12P/Pons-Brooks Closest to Earth (1.546033 au)
3	03:30	Moon 6° NE of Mars
4	11:32	Venus Superior Conjunction (occ.)
4	04:45	Jupiter 0.2° NE of Mercury
5	05:00	Moon 3.6° NW of Jupiter
5	05:00	Moon 4.6° WNW of Mercury
6	08:38	**New Moon** (Lunation 1255)
6	14:00	Sun at 5h RA
8	22:00	Moon 4.0° WSW of Pollux
9	06:36	Saturn Quadrature (90°W)
9	22:00	Moon 5.0° NW of M44
11	23:00	Moon 2.7° N of Regulus
12		Equation of Time = 0
14	01:18	**First Quarter Moon**
14	05:10	Earliest Sunrise
16	12:33	Mercury Superior Conjunction
16	22:00	Moon 3.3° ESE of Spica
20	14:12	Neptune Quadrature (90°W)
20	02:00	Moon 3.0° W of Antares
20	16:51	**Solstice**
21	01:00	Sun at 6h RA
21	02:04	Sun at 0° Galactic Latitude
21	04:00	Sun in Gemini
21	21:08	**Full Strawberry Moon**
22	00:57	Most Southerly Full Moon Transit (18°57′)
23	00:30	Moon occults Ceres (7.5, in 12:30, out 1:49)
23	22:00	2 Pallas passes T CrB
26	20:24	Latest Sunset
27	04:00	Moon 6.0° SW of Saturn ()
28	04:00	Moon 0.3° S of Neptune
28	17:53	**Last Quarter Moon**
30	17:15	Saturn Stationary

Ephemeris times are in EDT (UTC-4) for Seagrave Observatory (41.845N, 71.590W)



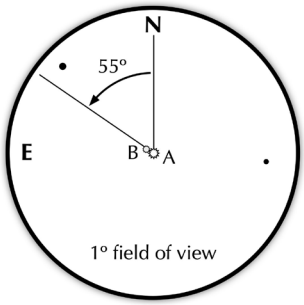
Other Suns: Beta Cygni (Albireo)

How to Beta Cygni on a June evening

Look in the east for the Milky Way and Cygnus. The Northern Cross shape of Cygnus lies in a horizontal position. The southernmost star of the Cross is Beta, also known as Albireo.

Beta Cygni
A-B separation: 35 sec
A magnitude: 3.4
B magnitude: 4.7
Position Angle: 55°
A & B colors: orange, blue

Suggested magnification: >30x
Suggested aperture: >2 inches



Try 10x50 binoculars to separate Albireo.

on the 4th, with the two planets appearing just 0.2° apart and rising at 4:34am EDT.

On the 9th, **Saturn** reaches its point of western quadrature, 90° from the Sun.

Saturn becomes an evening planet in late June, rising before midnight beginning on the 29th.

Saturn reaches its stationary point on the 30th, and will be in apparent retrograde motion through Capricornus through November 16th.

With Saturn well above the horizon during the early morning hours, and observing season for the ringed planet now underway, take note of the narrow ring plane angle. Now just 2.5° relative to Earth, Saturn's equatorial plane takes on a linear appearance, not unlike that of Jupiter. Its satellites will now appear to cross in front of the planet, and with the Sun-relative plane at just 5.5°, some of the moons will cast shadows upon the planet. A sufficiently large telescope and steady seeing conditions will be needed to see even the shadow of the largest of Saturn's moons, Titan, which will be just three quarters of an arcsecond in size when it crosses Saturn's cloud tops once every 16 days.

What may be easier to observe is the moons being eclipsed by Saturn.

Uranus is now in Taurus, and rises even with the Pleiades cluster. The planet will be difficult to observe in early June, with it rising during twilight, but during the s second half of the month, it can be spotted with binoculars just over 6° southwest of the cluster.

Neptune is at western quadrature on the 20th, bringing our most distant planet into position for observability in the morning sky. Throughout June, it is located just over 10° east-northeast of Saturn, the line between the two planets paralleling the ecliptic, which lies just over 1° to their north.

While Neptune is just over 5° southeast of the Circlet asterism of Pisces, more specifically, its southeasternmost magnitude 4.5 star lambda, Neptune now lies closer to an asterism of 5th magnitude stars which will make an easy reference point for tracking the planet during the 2024-25 observing season.

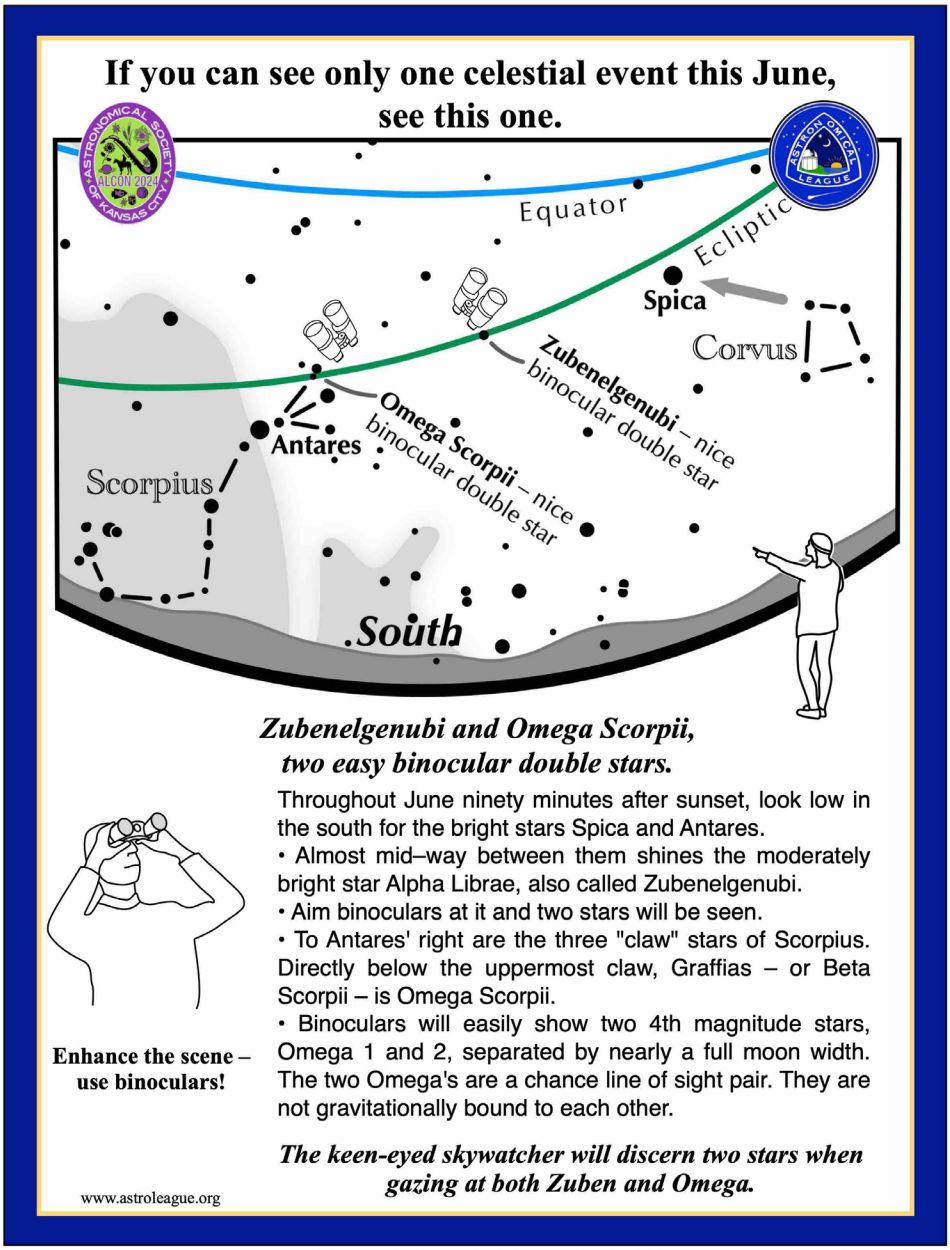
Starting at Saturn, move 10° due east, just over one binocular field of view. From there, you will come across a quadrilateral of stars ranging from magnitude 4.4 to 5.1 which comprise a near-perfect rectangle defined by the stars, from north to south, 29, 27, 33, and 30 Piscium. The quadrilateral is a near-perfect rectangle, 3°x0.5° and oriented roughly north-northeast to south-southwest, with the northern pair of stars being slightly fainter than the southern pair. The northeastern vertex, defined by 29 Psc, the dimmest star of the quartet, forms the acute vertex, resulting in the eastern side of the quadrilateral being slightly longer than the western side.

Now that you are familiar with this asterism, use the eastern (long) side to draw a line from 33 and through 29. Continuing this line 1.7°, slightly more than three apparent diameters of the Moon, and you will arrive at Neptune.

Help in finding Neptune comes by way of the waning gibbous Moon on the morning of the 28th, when, just before 4:00am EDT, the distant planet will be just 0.3° of our satellite. The two objects will easily fit within the same telescopic field of view. During alignments like this it's always fascinating to compare the objects in view for matter of perspective. In this instance, Neptune is 14 times the diameter of the Moon (measured at the polar axis). At 12,050 times the distance, light from Neptune takes 247.5 minutes to reach us, whereas the Moon is just 1.3 light seconds away.

4 Vesta continues its easterly trek through Gemini during the first half of June, moving into Cancer on the 14th. Remaining at magnitude 8.4 from its distance of over 3 au, our sky's brightest asteroid is becoming more difficult to observe as it slips into twilight.

Perhaps the month's best night for observing Vesta comes on the 8th, when the 2.1-day, 7.4% illuminated crescent Moon lies 5.5° to its west-northwest. Although this is not a close passage by the Moon, an easy journey through Gemini with a small telescope at low magnification will lead you right to it. Starting at the Moon, move northeast just about 1.5° to find magnitude 4.1 upsilon Geminorum. From there, move directly to the left, 3.2° east-southeast to magnitude 3.4 kappa



Geminorum. Vesta is just 1.6° southeast of this star. Be sure to distinguish it from magnitude 7.3 82 Geminorum, which is just 0.5° to its southwest.

Asteroid 2 Pallas is well-placed for observing during June, looping westward through Corona Borealis, its position well north of the ecliptic being a result of its highly inclined 35° orbit. On the 25th, it moves southwestward into Serpens.

From June 20-27, Pallas lies within 0.5° of T Coronae Borealis, a recurrent nova that is expected to undergo its once-per-80-year outburst sometime in 2024. The asteroid passes as close to 0.2° southeast of its location on the 23rd, and while the star is still quiescent, it will hover around magnitude 10.0, just slightly dimmer than Pallas.

1 Ceres is moving west-southwestward through Sagittarius. Its southerly declination places it in its most favorable viewing position after 2:00am during June. The presence of bright moonlight will hamper observations of the magnitude 7.5 dwarf planet during the latter half of June, but on the 22nd, the Moon occults Ceres, beginning at 12:30am and ending at 1:49am. A medium-sized telescope with high magnification will be sufficient to observe the occultation.

Pluto, at a distance of 34.2 au in Capricornus, shines at a dim magnitude 14.4 and can be found 2.7° east-southeast of the globular cluster M75.

June brings the shortest nights, and with the onset of astronomical darkness not arriving until well after 10:00pm, night sky observing opportunities can be seemingly scarce.

This is the first time of the year when the Milky Way begins to appear soon after darkness. Scorpius and Sagittarius begin to dominate the southern sky, and Ursa Major has rounded its way west of the meridian.

High in the south, we turn our attention to a tight little constellation of moderately bright stars that is unfortunately overlooked due to its lack of notable deep sky objects that are accessible to small telescopes, although it does contain two notable double stars that are on the Astronomical League's Double Star Observing Program: zeta and sigma Coronae Borealis. Asteroid hunters will be turning their attention to the Northern Crown constellation this month as the second-discovered asteroid, Pallas, is currently traversing it.

But what we will be looking for in Corona Borealis this year is a variable star known as **T Coronae Borealis** (CrB). T Crb is what is known as a recurrent nova. Nova, meaning "new," is a type of variable star where an outburst results in a sudden but temporary brightening, usually by many magnitudes.

Before knowledge of modern astrophysics and without the possession of instruments to observe them, early astronomers noted when a "new" star would suddenly appear where there was no visible star previously.

T CrB is a recurrent nova, meaning that there is an astrophysical process in place that is cyclic, resulting in the "nova" occurring at regular intervals. In the case of T CrB, the cycle is about 80 years, with the last outburst observed in 1946.

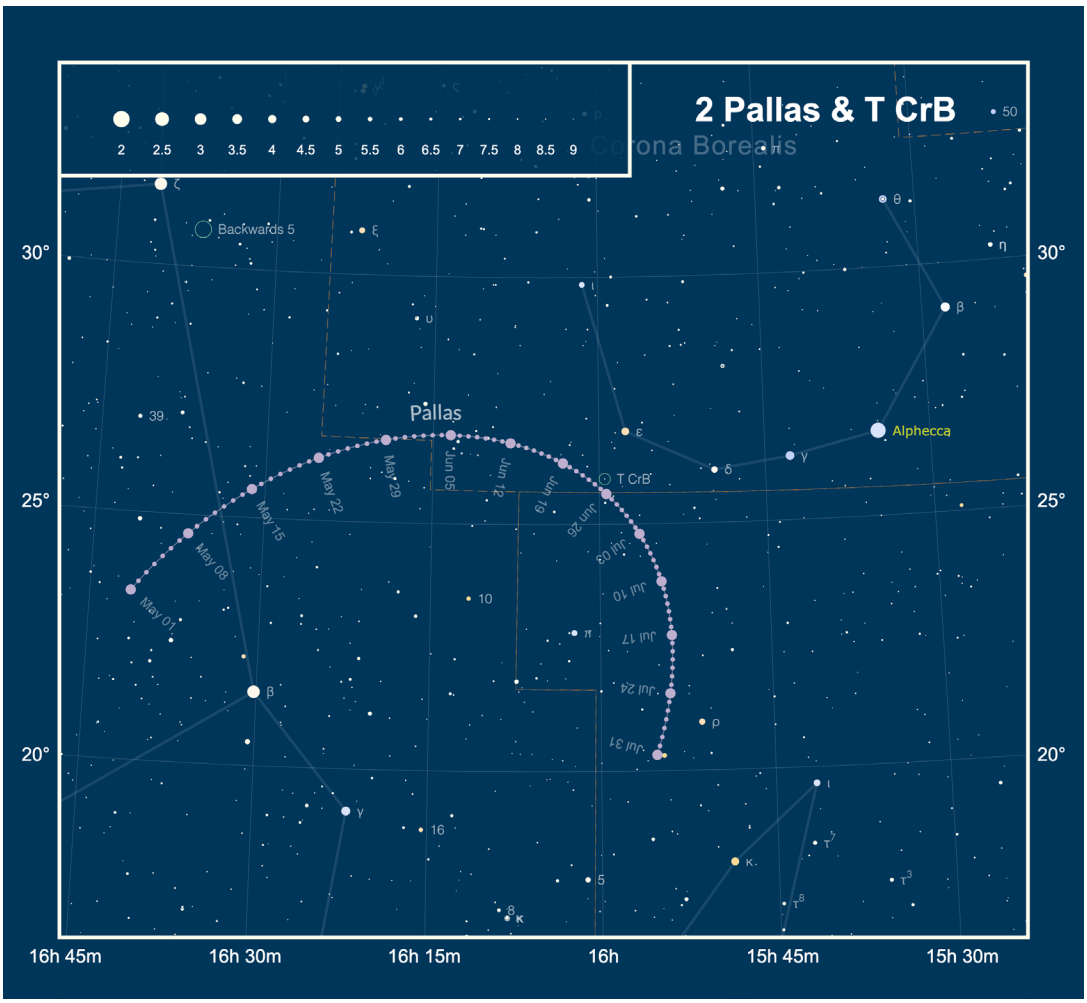
The mechanism driving the cycle is a result of T CrB being a binary system composed of a white dwarf and a red giant star. A white dwarf is a dense, dormant remnant of a star that is no longer undergoing fusion at its core, Its only energy is the residual thermal energy left over from its main sequence phase. A red giant is a low-density, bloated cool star. The white dwarf seeps up some of the red giant's outer material, and when enough of this material collects in a thin layer on the surface of the white dwarf, the pressure and temperature of this layer flashes in a runaway thermonuclear reaction, causing the nova.

When this happens, the star will rapidly brighten from its quiescent 10th magnitude up to an expected 2nd, placing it within naked-eye visibility and causing a notable change in the constellation. The brightening may last from several days to a few weeks.

The nova may occur any time between now and November 2024. An observing campaign is underway to catch T CrB in the earliest phases of its nova outburst, so be sure to keep watching it.

Once it fades out, the cycle begins anew, with the next outburst in the early 2100s.

Finally, one of the lesser-known meteor showers, the Bootids, is active during the closing days of June. Although not a very active shower, the radiant is well-placed high overhead during evening hours, and it is not uncommon to see a meteor or two during your sessions.



Observer's Challenge:

Hickson 68:
Galaxy Group in Canes Venatici

by Glenn Chaple

NGC 5350 (Barred Spiral; Mag. 11.4; Dim. 3.2' X 2.6); NGC 5353 (Lenticular; Mag. 11.1; Dim. 2.8' X 1.5'); NGC 5354 (Lenticular; Mag. 11.5; Dim. 2.3' X 2.0'); NGC 5355 (Lenticular; Mag. 13.1; Dim. 1.5' X 0.9'); NGC 5358 (Lenticular; Mag. 13.6; Dim. 1.3' X 0.4)

Last month's Observer's Challenge was the galaxy group Hickson 44 - one of 100 compact galaxy groups cataloged during a systematic study of the Palomar Observatory Sky Survey red prints by Canadian professional astronomer Paul Hickson and his colleagues in the early1980s. Another of his compact galaxy groups that can (mostly) be reached with 6-inch scopes and up is Hickson 68, a five-galaxy cluster located in the eastern part of Canes Venatici.

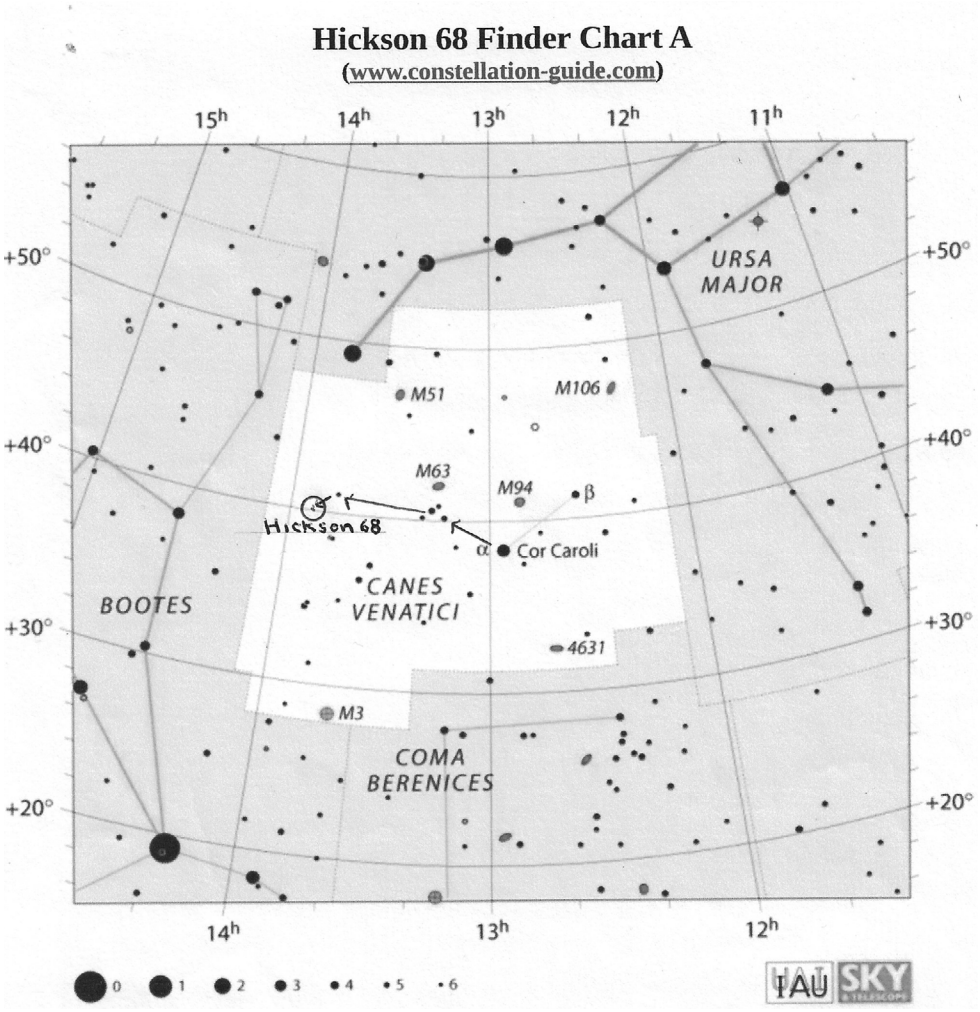
The brightest member of the quintet, the lenticular galaxy NGC 5353, is located at the 2000.0 coordinates RA 13h53m26.7s and Dec +40o16'59". I star-hopped there, starting at the showpiece double star Cor Caroli (alpha [α] Canum Venaticorum) and then moving 4 degrees ENE to an asterism comprised of four 5th and 6th magnitude stars. From there, I made a 7 degrees jump further east and slightly north to a magnitude 5.9 star. Just 1½o ESE of this star is a yellowish magnitude 6.5 star that lies at the center of Hickson 68 (refer to accompanying finder charts).

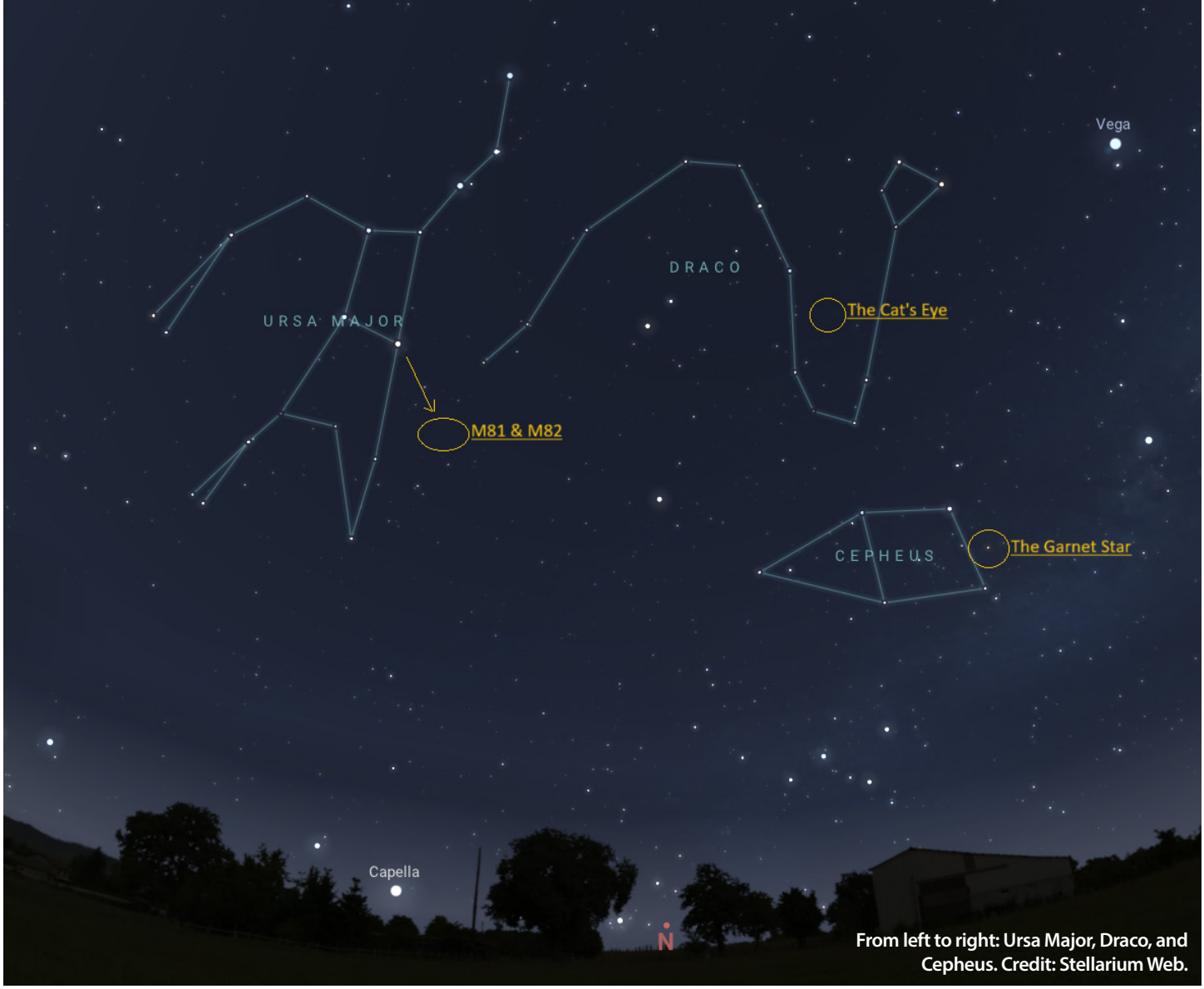
Using a 10-inch f/5 reflecting telescope and magnifying power of 139X under magnitude 5 suburban skies, I was immediately able to pick out the two brightest members, the oval-shaped lenticular galaxy NGC 5353 and the roundish spiral NGC 5350. The latter was somewhat veiled by the mag 6.5 star. As my eyes dark-adapted I was able to glimpse lenticular NGC 5354 immediately north of NGC 5353. I was unable to detect the faint lenticular galaxies NGC 5355 and NGC 5358. Before leaving the area, I directed my gaze ½o east and slightly north of NGC 5353 to the neighboring spiral galaxy NGC 5371. Similar in brightness to NGC 5350 but slightly larger, it required averted vision.

Using an 18.7-inch reflector, William Herschel came across NGC 5350, 5353, 5354, and 5355 on the evening of January 14, 1788. The faintest Hickson 68 member, the lenticular galaxy NGC 5358, remained undiscovered until June 23, 1880, when the French astronomer Édouard Stephan captured it with a 31-inch reflector. The entire group is about 100 light years away.

This was taken with my 32 inch F6.5 scope from Gloucester, using Lum, and RGB filters, for a total of about 3 hours imaging, then processed in PixInsight. Mario Motta, MD (ATMoB)

The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to anyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'd be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to Roger Ivester (rogerivester@me.com). To find out more about the Observer's Challenge, log on to rogerivester.com/category/observers-challenge-reports-complete.





From left to right: Ursa Major, Draco, and Cepheus. Credit: Stellarium Web.

NASA Night Sky Notes:

Constant Companions: Circumpolar Constellations, Part III

by Kat Troche

In our final installment of the stars around the North Star, we look ahead to the summer months, where depending on your latitude, the items in these circumpolar constellations are nice and high. Today, we'll discuss **Cepheus**, **Draco**, and **Ursa Major**. These objects can all be spotted with a medium to large-sized telescope under dark skies.

From left to right: Ursa Major, Draco, and Cepheus. Credit: Stellarium Web.

• **Herschel's Garnet Star:** Mu Cephei is a deep-red hypergiant known as The Garnet Star, or Erakis. While the star is not part of the constellation pattern, it sits within the constellation boundary of Cepheus, and is more than 1,000 times the size of our Sun. Like its neighbor Delta Cephei, this star is variable, but is not a reliable Cepheid variable. Rather, its brightness can vary anywhere between 3.4 to 5.1 in visible magnitude, over the course of 2-12 years.

• **The Cat's Eye Nebula:** Labeled a planetary nebula, there are no planets to be found at the center of this object. Observations taken with NASA's Chandra X-ray Observatory and Hubble Space Telescopes give astronomers a better understanding of this complex, potential binary star, and how its core ejected enough mass to produce the rings of dust. When searching for this object, look towards the 'belly' of Draco with a medium-sized telescope.

• **Bode's Galaxy and the Cigar Galaxy:** Using the arrow on the star map, look diagonal from the star Dubhe in Ursa Major. There you will find Bode's Galaxy (Messier 81) and the Cigar Galaxy (Messier 82). Sometimes referred to as Bode's Nebula, these two galaxies can be spotted with a small to medium-sized telescope. Bode's Galaxy is a classic spiral shape, similar to our own Milky Way galaxy and our neighbor, Andromeda. The Cigar Galaxy, however, is known as a starburst galaxy type, known to have a high star formation rate and incredible shapes. This image composite from 2006 combines the power of three great observatories: the Hubble Space Telescope imaged hydrogen in orange, and visible light in yellow green; Chandra X-Ray

Observatory portrayed X-ray in blue; Spitzer Space Telescope captured infrared light in red.

This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

The Cigar Galaxy. Credit: NASA, ESA, CXC, and JPL-Caltech

This composite of data from NASA's Chandra X-ray Observatory and Hubble Space Telescope gives astronomers a new look for NGC 6543, better known as the Cat's Eye nebula. This planetary nebula represents a phase of stellar evolution that our sun may well experience several billion years from now. Credit: X-ray: NASA/CXC/SAO; Optical: NASA/STScI

Solar Eclipse April 8, 2024

Totality from San Antonio, TX

by David G. Iadevaia

I am a Regional Coordinator for the NASA/NSF funded DEB Initiative (https://debinitiative.org/). We had 80 sites along the path of totality. 60 sites got good data. My site at St Francis of Assisi Church in San Antonio, TX was clouded out.

The night of 6 April I was setting up my equipment and had a group of 30 interested people come by asking what I was doing. A couple assisted me in polar aligning the DEB telescope. Of course I couldn't help myself and we had an impromptu star party!

As part of the NASA Eclipse Stars program I gave a lecture the night before the eclipse to over 100 attendees. Hope was still high for a clear eclipse day…alas that was not to be. The day started with high thin clouds than got thicker.

But that didn't deter about 80 people who brought lawn chairs and picnic snacks to view the eclipse. Since it was cloudy I couldn't do much science so I got right in the middle of the group and explained what was happening. Under a very dark sky during totality the people cheered unlike others in Texas under cloudy skies. It was a great time the people were wonderful!

While my science equipment wasn't fast enough to get data though the occasional sucker holes. Linda was quick on the draw with her Canon and managed to get the only image at DEB Site 005 during a split second hole in the clouds during the partial phase!

For those interested I live streamed the event on my You Tube Channel at https://www.youtube.com/user/davidiadevaia

April 8, 2024 – The day of the Great North American Solar Eclipse

by Mercedes Rivero H.

After a wonderful experience in Great Island, Nebraska, observing with my immediate family the 2017 total solar eclipse, I knew I was going to try to make it to this year's total solar eclipse. By the fall of 2022, based on several weather databases, I, like so many of us, had a sense that the best conditions were expected to be in the southwest. I wanted to be in a park, and started to look at several state parks in Texas (TX), in or near the path of totality; I narrowed

the area, and in October 2023, on my way back to Rhode Island from New Mexico (where I had the opportunity to join other Skyscrapers members to observe the annular solar eclipse), I visited friends in Austin, TX. We drove to Fredericksburg, scouted several parks and locations, did a short hike in Enchanted Rock park, and decided that was where we wanted to go, camp and observe the eclipse. The drawback was that reservations for campsites and/or day passes for April 8, were not going to open until November 8 and only by phone; needless to say, that day my friends and I were on our phones calling to reserve our spots (site or day passes, whatever we could find) and were not successful (we called other parks as well). Nonetheless, we agreed we would drive on April 8 to the Fredericksburg area, find a place to park and spend the day.

We all know what happened weather-wise that day in the southwest, no need to repeat details here: it was cloudy with sporadic clear patches of sky. We decided to keep our original plans instead of driving farther in other directions, as the clear-skies conditions were uncertain elsewhere. The previous day we had learnt about "Lady Bird Johnson municipal park" in the outskirts of Fredericksburg, and that is where we chose to go. We left Austin at 4:30 a.m., arrived at the park at 6:00 a.m. (it had opened at 5:30 a.m.); it was still dark and few other people had already arrived; staff at the gate welcomed us and asked where we were from, and we proceeded to drive around and park the car.

As soon as daylight arrived, one of my friends and I went for a walk. She bought commemorative T-shirts for her manfriend and the two of us (we wore them right away), and I ended up buying yet one more coffee mug. Later on, I went for other walks: to take a look at the park trails, which were well maintained; to find out what equipment other people were setting: solar scopes, cameras, filters, etc. (one family had traveled from Washington state and had a nice solar scope setup); to check out food venues. There were several birdwatchers, who pointed out to me that birdwatching was the reason they were in the park, not because of the eclipse.

Around 10 a.m. hopes rose as the skies cleared significantly, even though we could see clouds lurking in the horizon. By 10:30 a.m. the mac'n cheese truck (Mac'N Wag'N) had opened and there we were: delicious! (we enjoyed the lunch we had brought later in the day). Then, the partial eclipse started and clouds started to move in; though not completely overcast, we could see the sun through open patches in the clouds.

Finally, totality arrived and everybody was mesmerized. The eastern border of the park is "Gillespie county airport," whose lights came on during totality. One could observe the corona here and there, mostly the light scattering in the clouds. And then, four minutes later the total eclipse was over and the second partial started; the latter was completely obscured by the clouds, and I kept tracking its progression by looking at the time.

The park started to clear out of people right after totality. We ate the lunch we had packed and before leaving the park, we stopped to talk with the staff at the gate – the same people who had greeted us at 6:00 a.m. when we arrived; they said I was the only RI resident who visited the park. We left the park around 3:30 p.m. and, on our way back to Austin, visited "Pedernales Falls state park," where we admired the beautiful water falls and "Cypress pool."

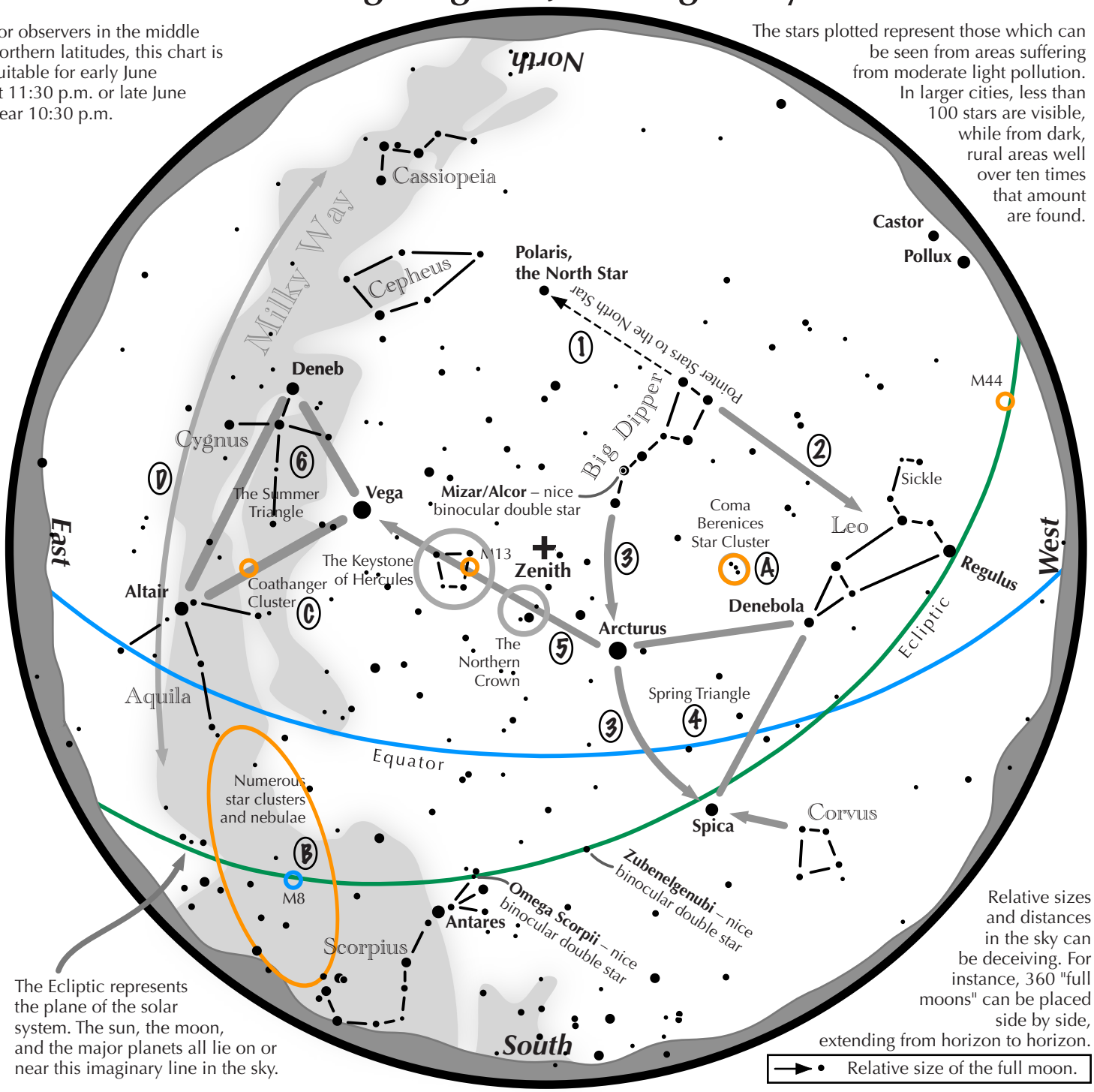
Another wonderful experience!

N.B.: whenever you visit Austin, stop by "Budare's" (my friend's food-truck) and enjoy Venezuelan food; the address is: 5000 Burnet Rd., Austin (budaresatx.com).

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

Navigating the June night sky: Simply start with what you know or with what you can easily find.

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
3. Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
4. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
5. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
6. High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
D. Sweep along the Milky Way for an astounding number of faint glows and dark bays.

The Sun, Moon & Planets in June

This table contains the ephemeris of the objects in the Solar System for each Saturday night in June 2024. Times in Eastern Daylight Time (UTC-4) 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**	4 37.7	22 05.4	Tau	-26.8	1892.7	-	-	-	1.014	05:13	12:44	20:15
	8	5 06.5	22 52.1	Tau	-26.8	1890.9	-	-	-	1.015	05:11	12:45	20:20
	15	5 35.6	23 19.1	Tau	-26.8	1889.5	-	-	-	1.016	05:10	12:47	20:23
	22	6 04.7	23 25.9	Gem	-26.8	1888.5	-	-	-	1.016	05:11	12:48	20:25
	29	6 33.8	23 12.6	Gem	-26.8	1887.9	-	-	-	1.017	05:14	12:49	20:25
Moon	**1**	23 54.7	-2 44.6	Psc	-11.6	1920.9	73° W	36	-	-	02:15	08:25	14:48
	8	6 25.5	27 44.7	Aur	-8.8	1885.8	19° E	3	-	-	06:39	14:51	22:56
	15	12 11.4	-0 56.0	Vir	-11.9	1797.6	98° E	57	-	-	14:08	20:01	01:43
	22	18 05.3	-29 00.8	Sgr	-12.7	1884.2	175° E	100	-	-	20:43	00:57	05:12
	29	0 34.0	2 38.1	Psc	-11.9	1918.0	89° W	49	-	-	00:42	07:10	13:53
Mercury	**1**	3 34.2	17 45.8	Tau	-0.8	5.6	16° W	82	0.350	1.198	04:31	11:43	18:56
	8	4 31.7	21 42.4	Tau	-1.6	5.2	8° W	95	0.317	1.288	04:44	12:13	19:44
	15	5 37.1	24 19.7	Tau	-2.3	5.1	1° E	100	0.308	1.323	05:10	12:52	20:34
	22	6 43.5	24 48.7	Gem	-1.4	5.2	9° E	94	0.328	1.291	05:48	13:30	21:13
	29	7 43.6	23 14.7	Gem	-0.7	5.6	16° E	82	0.365	1.211	06:28	14:02	21:36
Venus	**1**	4 33.6	21 44.9	Tau	-3.8	9.8	1° W	100	0.721	1.735	05:13	12:40	20:09
	8	5 10.5	23 01.4	Tau	-3.8	9.8	1° E	100	0.720	1.735	05:16	12:50	20:24
	15	5 47.8	23 45.4	Tau	-3.8	9.8	3° E	100	0.720	1.732	05:23	13:00	20:37
	22	6 25.5	23 55.3	Gem	-3.8	9.8	5° E	100	0.719	1.727	05:32	13:10	20:47
	29	7 03.0	23 30.4	Gem	-3.8	9.8	7° E	99	0.719	1.718	05:44	13:20	20:55
Mars	**1**	1 30.2	8 10.5	Psc	1.0	5.0	47° W	92	1.385	1.859	03:03	09:36	16:09
	8	1 49.9	10 05.9	Psc	1.0	5.1	49° W	92	1.388	1.832	02:48	09:28	16:08
	15	2 09.7	11 55.8	Ari	1.0	5.2	50° W	91	1.392	1.804	02:33	09:20	16:07
	22	2 29.5	13 39.4	Ari	1.0	5.3	52° W	91	1.396	1.776	02:19	09:12	16:06
	29	2 49.4	15 16.0	Ari	1.0	5.4	53° W	91	1.400	1.747	02:05	09:04	16:05
1 Ceres	**1**	19 31.1	-26 14.5	Sgr	8.0	0.6	140° W	99	2.875	2.020	23:18	03:36	07:54
	8	19 27.7	-26 50.6	Sgr	7.8	0.6	148° W	99	2.880	1.969	22:50	03:05	07:20
	15	19 23.1	-27 28.0	Sgr	7.7	0.6	155° W	99	2.884	1.929	22:21	02:33	06:44
	22	19 17.5	-28 05.5	Sgr	7.5	0.7	163° W	100	2.888	1.901	21:51	01:59	06:08
	29	19 11.1	-28 41.3	Sgr	7.4	0.7	170° W	100	2.893	1.886	21:20	01:26	05:31
Jupiter	**1**	3 57.8	19 44.5	Tau	-1.9	32.7	10° W	100	5.019	6.016	04:44	12:02	19:19
	8	4 04.6	20 04.1	Tau	-1.9	32.8	15° W	100	5.021	5.996	04:22	11:41	19:00
	15	4 11.3	20 22.5	Tau	-1.9	33.0	20° W	100	5.023	5.967	04:00	11:20	18:41
	22	4 18.0	20 39.5	Tau	-1.9	33.2	25° W	100	5.025	5.929	03:38	10:59	18:21
	29	4 24.5	20 55.1	Tau	-1.9	33.5	30° W	100	5.027	5.881	03:16	10:38	18:01
Saturn	**1**	23 21.5	-6 09.7	Aqr	1.2	16.9	82° W	100	9.694	9.778	01:46	07:26	13:06
	8	23 22.7	-6 04.4	Aqr	1.1	17.1	89° W	100	9.692	9.662	01:19	06:59	12:40
	15	23 23.5	-6 01.1	Aqr	1.1	17.3	95° W	100	9.690	9.546	00:52	06:33	12:13
	22	23 24.0	-5 59.6	Aqr	1.1	17.6	102° W	100	9.688	9.431	00:25	06:06	11:46
	29	23 24.2	-6 00.1	Aqr	1.1	17.8	108° W	100	9.686	9.318	23:58	05:38	11:19
Uranus	**1**	3 27.5	18 33.6	Tau	5.8	3.4	17° W	100	19.589	20.557	04:19	11:31	18:43
	8	3 29.1	18 39.3	Tau	5.8	3.4	23° W	100	19.588	20.517	03:52	11:05	18:18
	15	3 30.6	18 44.8	Tau	5.8	3.4	29° W	100	19.587	20.465	03:26	10:39	17:52
	22	3 32.1	18 50.0	Tau	5.8	3.5	36° W	100	19.585	20.401	03:00	10:13	17:26
	29	3 33.4	18 54.8	Tau	5.8	3.5	42° W	100	19.584	20.326	02:33	09:47	17:01
Neptune	**1**	0 00.8	-1 17.0	Psc	7.9	2.3	71° W	100	29.900	30.209	02:07	08:05	14:02
	8	0 01.2	-1 14.8	Psc	7.9	2.3	78° W	100	29.900	30.095	01:40	07:38	13:35
	15	0 01.5	-1 13.2	Psc	7.9	2.3	85° W	100	29.899	29.979	01:13	07:10	13:08
	22	0 01.7	-1 12.3	Psc	7.9	2.3	91° W	100	29.899	29.861	00:45	06:43	12:41
	29	0 01.8	-1 12.0	Psc	7.9	2.3	98° W	100	29.899	29.744	00:18	06:16	12:13
Pluto	**1**	20 19.7	-22 46.1	Cap	14.4	0.2	129° W	100	35.026	34.379	23:50	04:24	08:59
	8	20 19.3	-22 48.5	Cap	14.4	0.2	136° W	100	35.031	34.296	23:22	03:56	08:31
	15	20 18.8	-22 51.1	Cap	14.4	0.2	143° W	100	35.036	34.224	22:54	03:28	08:02
	22	20 18.3	-22 53.8	Cap	14.4	0.2	149° W	100	35.041	34.162	22:26	03:00	07:34
	29	20 17.7	-22 56.6	Cap	14.4	0.2	156° W	100	35.045	34.113	21:59	02:32	07:06

May 10-11 Aurora Borealis by John Kocur

Taken at 3:30am from northeastern Connecticut during the G5 geomagnetic storm.

Centaurus A & Omega Centauri by Greg Shanos

Check out these images. The first is straight out of the camera and the second is processed using the free program, Siril. A script has been written specifically to process FITS files from the SeeStar. I then used Photoshop CS4 with Neil Carboni's Astronomy Tools which automates many complex processing. Note how the processed image is not "that much superior" to the straight out of the camera aligned and stacked image. The SeeStar is a great piece of technology at an incredible price! April 15, 2024 A 44% phase moon was setting in the west. C77 Centaurus A was 19 degrees above the horizon at 12:47am. C80 Omega Centauri was 15 degrees above the horizon at 1:18am with moderate to severe light pollution.

Comet 12P/Pons-Brooks on March 30th by Greg Shanos

Comet 12P/Pons-Brooks under perfectly clear skies right down to the horizon. Comet was only 20 degrees in the sky and setting rapidly. Straight out of the camera- no post processing

Skyscrapers Attend Astronomy on Tap

by Jim Hendrickson

On Wednesday, May 8, several members of Skyscrapers attended the Astronomy on Tap event at Moniker Brewery in Providence. This was the first Astronomy on Tap event in Providence. The event was held in conjunction with the The Astrobiology Science Conference (AbSciCon) and featured Heather Graham, organic geochemist from NASA Goddard Space Flight Center, Ricardo Arévalo, geochemist at the University of Maryland, Kevin Hand, leader of the Ocean Worlds Laboratory at NASA's Jet Propulsion Laboratory, and Caleb Scharf, Senior Scientist for Astrobiology at the NASA Ames Research Center.

Astronomy on Tap features accessible, engaging presentations on space and science topics ranging from planets to black holes to galaxies to the beginning of the Universe, along with trivia, games, prizes, music, and other surprises! Presenters are typically from local research and educational institutions, but we also host visitor speakers with various backgrounds and roles as scientists, educators, artists, and more. There is always plenty of time to ask questions and interact with the presenters and other scientists who inevitably tag along for the fun.

For more information, see https://astronomyontap.org/

Directions to Seagrave Memorial Observatory

www.theSkyscrapers.org

From the Providence area:
Take Rt. 6 West to Interstate 295 in Johnston and proceed west on Rt. 6 to Scituate. In Scituate bear right off Rt. 6 onto Rt. 101. Turn right onto Rt. 116 North. Peeptoad Road is the first left off Rt. 116.

From Coventry/West Warwick area:
Take Rt. 116 North. Peeptoad Road is the first left after crossing Rt. 101.

From Southern Rhode Island:
Take Interstate 95 North. Exit onto Interstate 295 North in Warwick (left exit.) Exit to Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

From Northern Rhode Island:
Take Rt. 116 South. Follow Rt. 116 thru Greenville. Turn left at Knight's Farm intersection (Rt. 116 turns left) and follow Rt. 116. Watch for Peeptoad Road on the right.

From Connecticut:
• Take Rt. 44 East to Greenville and turn right on Rt. 116 South. Turn left at Knight's Farm intersection (Rt. 116 turn left) and follow Rt. 116. Watch for Peeptoad Road on the right.
• or • Take Rt. 6 East toward Rhode Island; bear left on Rt. 101 East and continue to intersection with Rt. 116. Turn left; Peeptoad Road is the first left off Rt. 116.

From Massachusetts:
Take Interstate 295 South (off Interstate 95 in Attleboro). Exit onto Rt. 6 West in Johnston. Bear right off Rt. 6 onto Rt. 101. Turn right on Rt. 116. Peeptoad Road is the first left off Rt. 116.

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