



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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The Moon Ain't Dead by Dr. Peter Schultz

Saturday, August 10 @ 7:00pm EDT
at Seagrave Memorial Observatory

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

Results of the Apollo missions seemed to indicate that the Moon died more than 3.2 billion years ago. As a graduate student more than 50 years ago, however, I recognized features on the Moon that were inconsistent with this widely held conclusion. First, I found and mapped peculiar ring moats and domes that were much too small to have survived 3 billions years of impact erosion. Based on detailed crater statistics, I was able to show that some mare regions were active as recently as 800 million years ago, not 3.2 billion. Second, there were narrow (only 10's meters across) sinuous ridges (often called mare ridges), scarps, and cracks that crossed small craters and many of the ridges extended across the cratered highlands, well away from the maria. And third, there were irregular rugged patches surrounded by near-vertical cliffs only several meters high in the middle of the lunar maria. These observations not only indicated that volcanic activity extended much longer than the Apollo samples indicated but also may be ongoing. While others noted these features, they did not recognize (or ignored) their significance as evidence of a Moon that had not yet stopped creaking and cracking. Instead, such features were simply anomalous, i.e., unimportant. In fact, anyone who suggested otherwise was considered to be...should I say...a lunatic. These features are now being rediscovered, not only due to the much broader coverage of the lunar surface at high resolution but also because of the new context.... going back after five decades.

Peter H. Schultz Bio

Pete's research focuses on impact cra-

tering processes as revealed by laboratory impact experiments, the planetary surface record, and terrestrial ground truth. His laboratory research has covered a wide range of topics: atmospheric effects on ejecta emplacement, impactor survival, secondary impact processes, antipodal shock effects, high-speed spectroscopy of impact vapor/plasma, impact angle effects (shock propagation, vaporization, target damage, and flow-field evolution), projectile fate after impacts, and crater-scaling relations. Of particular recent interest has addressed the origin of fluidized ejecta and blast winds around craters on Mars. Such basic research led to participation in numerous NASA planetary missions including Magellan, Deep Impact, Stardust-NExT, EPOXI, and LCROSS. He cut his teeth, so to speak, on basic lunar research: floor-fractured craters, beginning/end of volcanism, lunar swirl generation, polar volatile evolution, assessment of the size of impactors, evidence for ongoing lunar tectonic activity, and what caused the difference between the lunar nearside and farside. The last study proposed that a giant impact on the far side actually caused the concentration of maria on the nearside, i.e., the Man in the Moon. On Earth, his research has included the discovery of 8 impacts in Argentina, documentation of a witnessed crater-forming impact in Peru in 2007, and studying the effects of a giant cometary airblast across the Atacama Desert, Chile only about 11,500 years ago. He has published more than 200 papers and authored a book called Moon Morphology. Most recently, he contributed a chapter to a new book that shares stories



**Seagrave Memorial
Observatory
Open Nights**
August 3, 10, 17, 24, 31
@ 9pm

about growing up during the dawn of the Space Age (The Space Age Generation).

He received his BA from Carleton College (Northfield, MN) and PhD from the U. Texas-Austin. He subsequently went to NASA Ames as an NRC post-doctoral researcher, then Staff Scientist at LPI (1976-1984), and finally Professor at Brown University, becoming Emeri-

tus in 2014. His students have gone to become well-respected scientists across the world. He served as the Science Coordinator for the NASA Ames Vertical Gun Range from 1980 to 2014 and was the Principle Investigator and Director of both the NASA Rhode Island Space Grant program (1992-2022) and the Northeast Planetary Data Center at Brown (1984-2022).

He has been awarded the Distinguished Scientist Award (Hypervelocity Impact Society), Barringer Medal (Meteoritical Society), Medal of Achievement (National Academy of Sciences of Argentina), Distinguished Alumnae Achievement award (Carleton College), and the G. K. Gilbert Award (Geological Society of America). Asteroid 6952 is named "PeteSchultz."

President's Message

by Linda Bergemann

Preparations are well underway for this year's AstroAssembly, our annual fundraiser, on October 5th. We have a great line-up of speakers to fill the day, morning 'til night. Registration is now open. Details are online at: <https://skyscrapers-inc-de3d5c.ingress-baronn.ewp.live/astroassembly-2024/>.

We will begin with informal talks on AstroEve, Friday night, October 4th, followed by observing, if the weather cooperates. Attending AstroEve is free, and registration is not required. Contact Michael Corvese (corvesemichael@gmail.com) if you would like to give a short talk.

AstroAssembly begins Saturday morn-

ing with swap tables, solar viewing, telescope displays, and socializing. Let's not forget complimentary coffee and pastries. Our morning speaker will be Skyscrapers' member Allen Hall, who will describe the restoration of a 16-inch Cassegrain telescope for the University of Connecticut. Following lunch, we will have presentations by Jeff Norwood, of Camera Concepts and Telescope Solutions, Dr. Edward Guimont on "H. P. Lovecraft and Astronomy, and Dr. Douglas Gobeille on "Why Astrophysics Matters." Following a late afternoon snack/lite dinner (included with registration), we will present awards and conclude with Dr.

Peter Schultz on "Bad Day Over Chile: Impact of a Cometary Body?"

Please consider attending this great event; you will have an enjoyable time.

Related to AstroAssembly, I would like to express my sincere gratitude to members Bob Horton, Rick Lynch, Steve Siok and Jim Brenek, for decluttering and updating our meeting hall. The walls have been painted a warm green, a display area for astrophotography contest entries has been added, and items on the walls have been curated. The place looks inviting and awaits your next visit. See you there!

Warm wishes and clear skies.

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 **August 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.

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AstroAssembly 2024

Friday & Saturday, October 4 & 5

Seagrave Memorial Observatory 47 Peepetoad Road North Scituate, Rhode Island

AstroAssembly is the annual convention and fund-raising event for Skyscrapers, Inc., owners and operators of Seagrave Memorial Observatory, located in North Scituate, RI. The first “Amateur Astronomical Convention of the Skyscrapers” was held on August 2 & 3, 1952. Through the years, we have welcomed many notable speakers, including well-known astronomers, astrophysicists, scientists, and, even astronauts. This annual event brings together amateurs from all over the New England area to reconnect with old friends, learn something new and just have an enjoyable day.

The festivities will begin with **AstroAssembly Eve on Friday night** for those in the area; registration for AstroAssembly is not necessary to attend.

There will not be a Saturday evening banquet and speaker as in years past. We will instead, break at 5 PM for a snack and socializing, as well as distribution of awards and prizes. The program will conclude with our evening speaker at 6:30 PM.

All day Saturday at Seagrave Observatory

Swap Table (please bring your own table), Solar Viewing, Astro-Imaging Contest, Homemade Telescopes (bring yours!).

9:00 AM Registration Open

Morning coffee and pastries provided. Registration includes evening pizza and snacks.

Members: \$25 Non-members: \$30

10:30 AM – Allen Hall, Skyscrapers, Inc.

Restoring the 16” Group 128 Cassegrain for the University of Connecticut

12:00 PM – Deli Lunch

Choice of Grinder (Italian Deluxe, Turkey or Roast Beef), Spinach Pie or Salad (Garden, Garden w/ Grilled Chicken).

\$15 per person. Pre-order and payment with registration required.

Astro-Imaging Contest: Noon to 4:00 PM

See our website for more information.

1:15 PM – Jeff Norwood, Camera Concepts and Telescope Solutions

Recent Developments in Optical and Astronomical Equipment

2:30 PM – Dr. Edward Guimont, Bristol Community College

When the Stars are Right, HP Lovecraft and Astronomy

3:45 PM Doug Gobeille, University of Rhode Island

Extraterrestrials, Black Holes, and Death by Space: Why Astrophysics Matters

5:00 PM Socializing & Lite Dinner

Pizza, snacks, soda, water and coffee included with basic registration.

6:00 PM – Raffle and Astro-Imaging Awards

6:30 PM – Dr. Peter Schultz, Emeritus Brown University

Bad Day Over Chile: Impact of a Cometary Body?

8:00 PM – Observing at Seagrave Memorial Observatory

The observatory’s telescopes will be available for observing (weather permitting), or set up your own telescope on the grounds.

Information & Registration



theskyscrapers.org/astroassembly2024

Skylights: August 2024

by Jim Hendrickson

August 3 sees the last sunset during the 8:00pm hour until May 16, 2025. The Sun passes into Leo on the 10th, where it will spend the next 27 days. It is closest to the constellation's brightest star, Regulus, on the afternoon of the 22nd, coming to within just 0.2° of the star.

On the 18th, the Sun is halfway in declination between solstice and equinox: +12° 43' 09".

The 20th sees the last 6:00am sunrise until April 19, 2025.

By mid-August, it has become noticeable that the Sun is no longer near its high solstice perch, at +23.4° north declination. On the 18th, its northerly declination is halved, to +12.6°. From now on, it will seem to accelerate quickly southward towards the equinox, just 35 days away.

The **Moon** is new, in Cancer, at 7:13am on August 4, marking the beginning of Lunation 1257. Due to the Moon's location well north of the ecliptic, there's a fairly good opportunity to spot a young (13 hour) crescent just after sunset. The Sun sets at 7:59pm, and the 0.3% illuminated crescent Moon is down less than a half hour later. A low horizon, clear and transparent sky, and large binoculars or telescope will be needed for this observing challenge.

There is a dramatic pairing of the 2.2% waxing crescent Moon and Venus on the 5th, and on the 9th, the waxing crescent Moon is 4.8° west-northwest of Spica, in Virgo.

The Moon is first quarter, in Libra, at 11:19am on the 12th. The following evening, at 11:00pm, it lies 1.5° west-southwest of Antares, in Scorpius.

The Full Sturgeon Moon occurs at 2:26pm on the 19th, and rises at 7:58pm, in Aquarius.

Just past full, the Moon is 0.3° south of Saturn on the 20th. It passes 2.6° east-northeast of Neptune the following night, on the 21st.

One of the best Moon-Pleiades conjunctions of the year occurs just as the Moon rises on the 25th, with the last quarter Moon occulting some of the outer stars in the southeastern portion of the cluster.

The waning crescent Moon appears 6.0° northeast of Mars on the 28th, and just before dawn, 3.4° northeast of the open star cluster M35 in Gemini.

The waning Moon is then 5.1° north-northwest of Jupiter on the 27th, 4.1° west-northwest of open cluster M35, in Gemini, on the 28th, and 2.7° southwest of Pollux on the 30th.

Finally, on the 31st, the 6.7% illuminated waning crescent Moon is 3.4° north-northeast of the Beehive cluster in Cancer, M44.

Following a fairly good evening appearance of **Mercury** in July, the innermost planet becomes difficult to view in early August due to its low position, setting just 30 minutes after sunset.

Mercury returns to the morning sky for its best dawn apparition of the year after passing inferior conjunction on the 18th.

By the 23rd, Mercury rises 30 minutes before sunrise, 60 minutes on the 27th, and 100 minutes before sunrise on the 31st. The final week of the month is the best time to view Mercury's crescent phase with a telescope.

Although **Venus** is gradually increasing in separation from 15° to 24° east of the Sun over the course of August, in a peculiar circumstance resulting from its separation and the earlier sunsets, the planet itself actually sets earlier each night in August, from 8:52pm to 8:17pm. It does, however, remain visible after sunset for eleven more minutes at the end of the month (58 minutes) than on the 1st.

Gazing at Venus through a telescope low in the sky and through bright twilight will not reveal much. Its gibbous disk shows 96% in early August, and gains only a fraction of an arcsecond in apparent diameter at the end of the month, when its illuminated phase reaches a still barely discernible 91%, at just under eleven arcseconds.

In August, Venus appears best when it is paired with other celestial objects, especially when using binoculars or a low-power, wide-field telescope. On the 5th, the 2.2% illuminated waxing crescent Moon is just 0.4° north-northwest of the planet, and the entire first week of the month finds Venus passing close to Regulus, with the pair being separated by just 1.0° on the 4th.

Mars spends August moving eastward through Taurus, rising just after 1:00am on the 1st, and a few minutes past midnight at the end of the month.

Mars is still rather distant, ranging from 1.60 to 1.44 au during August, presenting a gibbous disk just over 6 arcseconds across. What it lacks in telescopic splendor, it makes up for in naked-eye and binocular viewing as it traverses the celestial bull.

During the first week of August, Mars is located about 5° degrees from the red giant star Aldebaran. Mars is currently shining at the same magnitude as Aldebaran, giving the

Events in August

3	20:00	Last 8pm sunset (until May 16)
4	07:13	New Moon (Lunation 1257)
4	04:21	Mercury Stationary
4	20:30	Venus 1.0° N of Regulus
4	16:00	7 Iris Opposition (mag 8.3)
4	14:00	Sun at 9h RA
5	20:30	Moon 0.4° NNE of Venus
9	21:00	Moon 4.8° WNW of Spica
10	09:00	Sun in Leo
12	09:00	Perseid Meteor Shower
12	11:19	First Quarter Moon
13	23:00	Moon 1.5° WSW of Antares
14	04:00	Jupiter 0.3° SE of Mars
15	23:00	Moon 2.5° NW of Ceres
18	17:00	Sun Declination ½ to Equinox (+12° 43' 09")
18	21:58	Mercury Inferior Conjunction
19	14:26	Full Sturgeon Moon
19	11:45	Uranus Quadrature (90°W)
20	06:00	Last 6:00am sunrise (until April 19)
20	12:00	Sun at 10h RA
20	22:00	Moon 0.3° S of Saturn
21	22:00	Moon 2.6° ENE of Neptune
25	23:00	Moon 0.3° S of M45
26	05:26	Last Quarter Moon
26	04:00	Mars 1.1° N of M1
27	05:00	Moon 5.1° NNW of Jupiter
27	22:41	Mercury Stationary
28	04:00	Moon 4.1° WNW of M35
30	03:00	Moon 2.7° SE of Pollux
31	04:00	Moon 3.4° NNE of M35

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

star a temporary twin.

The Red Planet's best performance of August occurs during mid-month, when it passes just 0.3° northwest of Jupiter on the 14th. On this date, Jupiter is 3.5 more distant from Earth than Mars, the light of the latter taking 12.7 minutes to reach us, while Jupiter is 44.7 light minutes away.

A view through any telescope presents the observer with six solar system objects within easy view, as Jupiter's four Galilean satellites will all be visible in the same field of view.

The two planets remain close enough to be observed together in binoculars for several days before and after conjunction.

Mars is just 1.1° north of the Crab Nebula, Messier 1, in Taurus on the 26th and 27th. On the 26th, the waning crescent Moon appears 6.0° northeast of Mars.

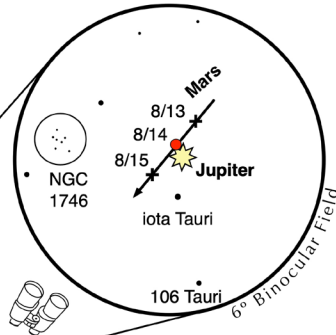
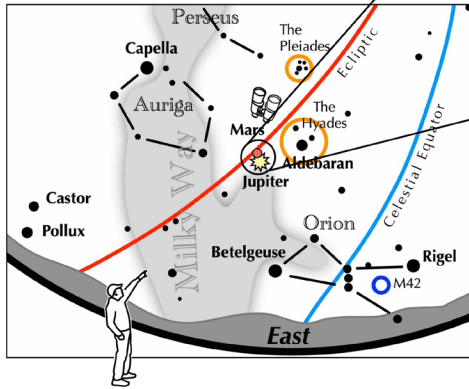
Jupiter joins the ranks of the evening planets in August, but only at the end of the month, when it rises at 11:45pm. Early in the month, observers will have to wait at least until 1:30am to see the giant planet enter the northeastern sky, in Taurus.

In a notable close conjunction, Jupiter is joined by Mars mid-month, coming to within

If you can view only one celestial event this month, view this one.

A slowly brightening Mars passes immediately north of the much brighter Jupiter.

1. Look to the east 90 minutes before sunrise on August 13, 14, and 15.
2. Find Mars and Jupiter shining left of the red star Aldebaran. Mars' brightness will nearly match that of Aldebaran.



Binocular View

3. Aim binoculars at Mars and Jupiter.
4. On the morning of August 14, they will be only 20 minutes apart.
5. They will be just 1.5° southwest of the open cluster NGC 1746.
6. A telescope at > 100 power will reveal Mars' tiny red disk and Jupiter's larger disk along with its four Galilean moons.



just 0.3° separation on the 14th.

Saturn is in eastern Aquarius, and rises just before 10:00pm at the beginning of the month, and by the end of the month, it is already above the horizon as twilight fades.

Beginning on the 18th, Saturn and Venus are above the horizon at the evening sky at the same time.

The just-past-full Moon is 0.3° south of Saturn on the 20th.

If you have a larger telescope, watch Saturn's moons as they transit and are eclipsed by the planet: Just after midnight on the 1st, Titan passes over Saturn's southern limb, followed by Dione and its shadow. On the 2nd-3rd, Rhea and its shadow transit Saturn. On the 3rd, Dione and its shadow can be seen exiting Saturn's eastern limb. Just before dawn on the 5th, Rhea and Dione drop into Saturn's shadow nearly simultaneously. Dione emerges from behind Saturn's western limb on the morning of the 8th. Titan briefly dips behind Saturn's northern limb after midnight on the 9th. Rhea, Dione, and their shadows cross Saturn's disk on the 11th-12th, followed shortly after by the disappearance of Tethys behind Saturn's shadow. Tethys and its shadow pass over Saturn just below the ring plane early on the 13th. Tethys can be seen passing completely behind Saturn on the 14th, and passing in front of Saturn, with its shadow, again after midnight on the 15th. Tethys can be seen passing completely behind Saturn again on the 15th-16th, followed shortly afterwards by the disappearance of Dione. Tethys then crosses in front of Saturn on the 16th-17th.

At midnight on the 17th, Titan can be seen hovering just below Saturn's south pole. Rhea

and Dione emerge from behind Saturn on the 17th-18th. Beginning at midnight on the 21st, Rhea and its shadow pass over Saturn. Dione and shadow transit Saturn on the 22rd-23th. On the 24th, Titan can be seen hovering just over Saturn's north pole. Dione passes into eclipse after midnight on the 27th. On the following evening, Tethys reemerges from behind Saturn's western limb. Tethys passes into eclipse on the morning of the 29th. Dione re-emerges from eclipse before midnight on the 29th, followed by Rhea going into transit. One final eclipse of Tethys occurs on the 31st, immediately followed by a transit of Dione.

Uranus, the third planet in Taurus, becomes an evening planet in August, rising before midnight starting during the sec-

ond week, and reaching its point of western quadrature on the 19th.

The planet lies within easy reach of binoculars just 5° south-southwest of the Pleiades cluster. To begin the journey, move 4.3° directly south from the Pleiades to find a pair of 6th magnitude stars, 13 and 14 Tauri, which lie on a 20 arcminute line (2/3 of the apparent diameter of the Moon) that lie in a nearly east-west orientation. 13 Tau, the western-most of the pair, is slightly brighter, and is the jumping-off point to locate Uranus. Uranus is a magnitude 5.7 pale blue-green object to the east-southeast of 13 Tau, which is the same brightness. The distance closes from 1.3° on August 1st to 1.0° on August 31st.

Neptune is in Pisces, and rises a few minutes later than Saturn, being located along the ecliptic about 12° east of the ringed planet.

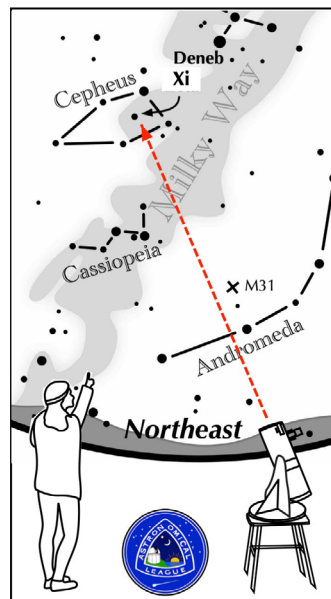
From the Cirlet asterism of Pisces, start at lambda, and go 5.3° southeast.

A line drawn from 33 Piscium through 29 Piscium, and extended another 1.6° northward, brings you to the magnitude 7.7 ice giant.

The waning gibbous Moon is 2.6° east-northeast of Neptune on the 21st.

1 Ceres is located in the center of the Teapot asterism of Sagittarius, and is at its best viewing position in early evenings in August. It dims from magnitude 7.8 to magnitude 8.4. Its position rather low in the sky and in a fairly dense section of the Milky Way, will make identifying it a challenge. Despite its relatively bright magnitude, it will require more than binoculars to locate. Unless you are located under a truly dark and transparent sky, a 4-inch telescope with medium magnification is likely to be needed to spot the dwarf planet.

ASTRONOMICAL LEAGUE Double Star Challenge



Other Suns: Xi Cephei

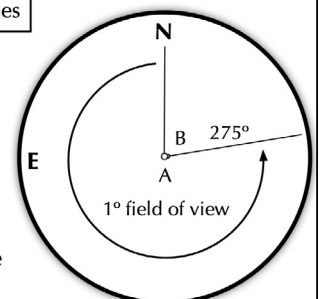
How to find Xi Cephei on an August evening

Find the stars forming the house shape of Cepheus, which is the constellation above Cassiopeia in the early evening in August. Xi is the central star in the southerly portion of the house shape of Cepheus.

Suggested magnification: >50x
Suggested aperture: >3 inches

Xi Cephei

- A-B separation: 7.9 sec
- A magnitude: 4.4
- B magnitude: 6.4
- Position Angle: 275°
- A & B colors: white & blue



The waxing gibbous Moon is 2.5° northwest of Ceres on the 15th.

At the beginning of August, Ceres is located about 1.8° north of the globular cluster M70, and as it completes its retrograde loop at the end of the month, Ceres is about 1.5° north of the globular cluster M69.

2 Pallas is moving southeastward just to the east of the head of the serpent, Serpens Caput, making an 8° radius arc to the southwest of Kornephoros (beta Herculis). The 10th magnitude asteroid should remain fairly easy to observe in small telescopes during moonless nights.

Asteroid **7 Iris** is at opposition on the 4th, at a distance of 3.10 au and magnitude 8.3, in Aquarius. It is located about 3.0° north of planetary nebula Caldwell 55, the Saturn Nebula, in Aquarius. On the 18th-19th, the asteroid is just 0.4° north of Albali (epsilon Aquarii).

Comet 13P/Olbers remains visible in the northwestern sky after dusk. As our distance

increases to over 2 au from the comet, it dims to an expected 10th magnitude. While this isn't impressively bright, this comet is notable for being in a favorable position for observation as it travels east-southeastward from Ursa Major and through Coma Berenices.

At the beginning of the month, the comet appears near the easternmost pair of the Three Leaps of the Gazelle, with the comet pointing due east of the stars. On August 14-18, it traverses the Coma Star Cluster (Melotte 111).

On August 25th it lies just 0.5° northeast of the galaxy M64, and on the 30th, it lies 1.0° north-northeast of the globular cluster M53, and 1.7° northeast of Diadem (alpha Comae Berenices).

The most significant active meteor shower in August is the **Perseids**, which generally shows activity from mid-July through the end of August, with peak occurring around August 11th-12th, when it is possible to see over 50 meteors per hour. The meteors appear to

originate from a point in northern Persus, which is circumpolar, so meteors can usually be seen at any time during hours of darkness. On the night of peak activity, a waning crescent Moon sets just before 11:00pm. Increasing moonlight interferes on subsequent nights, but the nights leading up to the 11th are more favorable.

Book Review

Astrobiology: The Search for Alien Life

by Andrew May, London: Icon Books, 2023, ISBN [9781785789700](https://www.isbn-international.org/product/9781785789700), hardbound, 20.00 GBP

Reviewed by Francine Jackson

For many of us, one of the first questions asked of us when we say we're into astronomy, is whether we believe in aliens. Today, though, alien life can have many definitions, including extremophiles present here on Earth. After reading this book, we shouldn't be worried about any answer we may give.

The author begins with the first question: Is there life on Earth? To us, this may sound like a "Duh!" moment, but "life" can have different meanings for different persons. In science, it can be any form of living thing; however, that may not be true elsewhere. If so, how do we even begin to look for living beings? And, what does "living beings" really mean? Are we forced to only attempt to find humanlike beings, as noted in almost every science fiction venue?

The author does introduce the history of attempting to look for life elsewhere. Of course, he does speak highly of Frank Drake, including his equation and the SETI work he performed in West Virginia. Also, the incredible work by Jocelyn Bell (Burnell) who, as a student, found what at first was thought to be messages from Little Green Men – what she found is now much

more important.

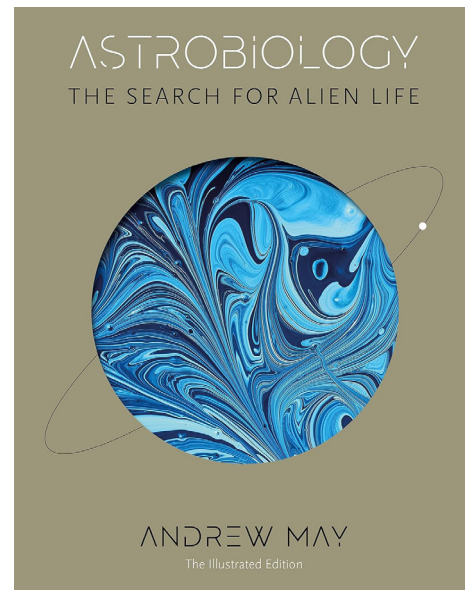
The study of potential alien life can't exclude Carl Sagan who, in addition to one of the most important science fiction books on the topic, was instrumental in designing the Pioneer Plaque.

And, then, we go into the new concept of looking for life: searching for planets – exoplanets – around other stars. With such instruments as Kepler and TESS, we are discovering thousands of them, of all differing forms: Hot Jupiters, potential watery bodies, total ice spheres. Many of these new planetary objects are so close to their respective star that their orbital periods are as short as just several of our days. Can any life exist in such an environment? But, then, are we working on the bias of life as we know it – can we keep this concept, or must we change and actually throw out everything we know and hold dear?

Astrobiology takes us through every aspect of life, both here and possibly elsewhere. The author delves into the potential of planets around all forms of stars, and what type of "Goldilocks zone" that could be present. He gives us tidbits on every way a life could exist, including examining the

science fiction views through the ages.

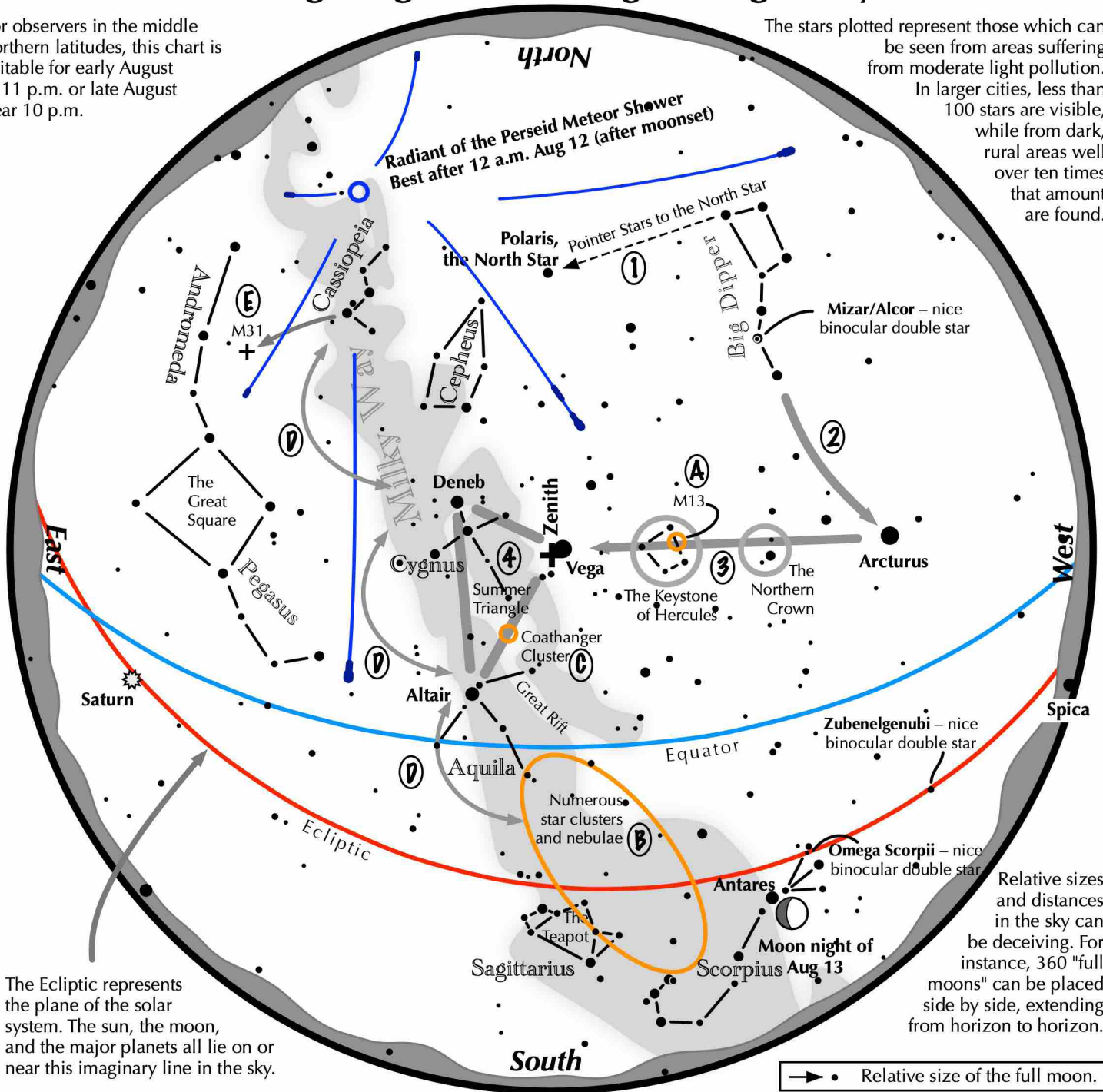
This book is full of beautiful images, depicting celestial bodies known to contain some form of water, portraits of exoplanets and their potential for any creatures, even nebulae where new planetary material might be in the birthing process. Both informative and entertaining, *Astrobiology* is a great and fun read.



Navigating the mid August Night Sky

For observers in the middle northern latitudes, this chart is suitable for early August at 11 p.m. or late August near 10 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 mid August 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 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the June evening sky.
- 3 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.
- 4 High in the East lies the summer triangle stars of Vega, Altair, and Deneb.

Binocular Highlights

- A:** On the western side of the Keystone glows the Great Hercules Cluster.
- B:** Between the bright stars 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, including the Great Rift.
- E:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.



Observer's Challenge: NGC 6058: Planetary Nebula in Hercules

by Glenn Chaple

(Magnitude 12.9; Size 24" X 21")

This month's Observer's Challenge takes us to the northwest corner of Hercules and the planetary nebula NGC 6058. It was discovered by William Herschel on the evening of March 18, 1787. He considered it to be very faint and small and therefore entered it in his Catalogue of Nebulae and Clusters of Stars as his 637th Class III (Very Faint Nebulae) find.

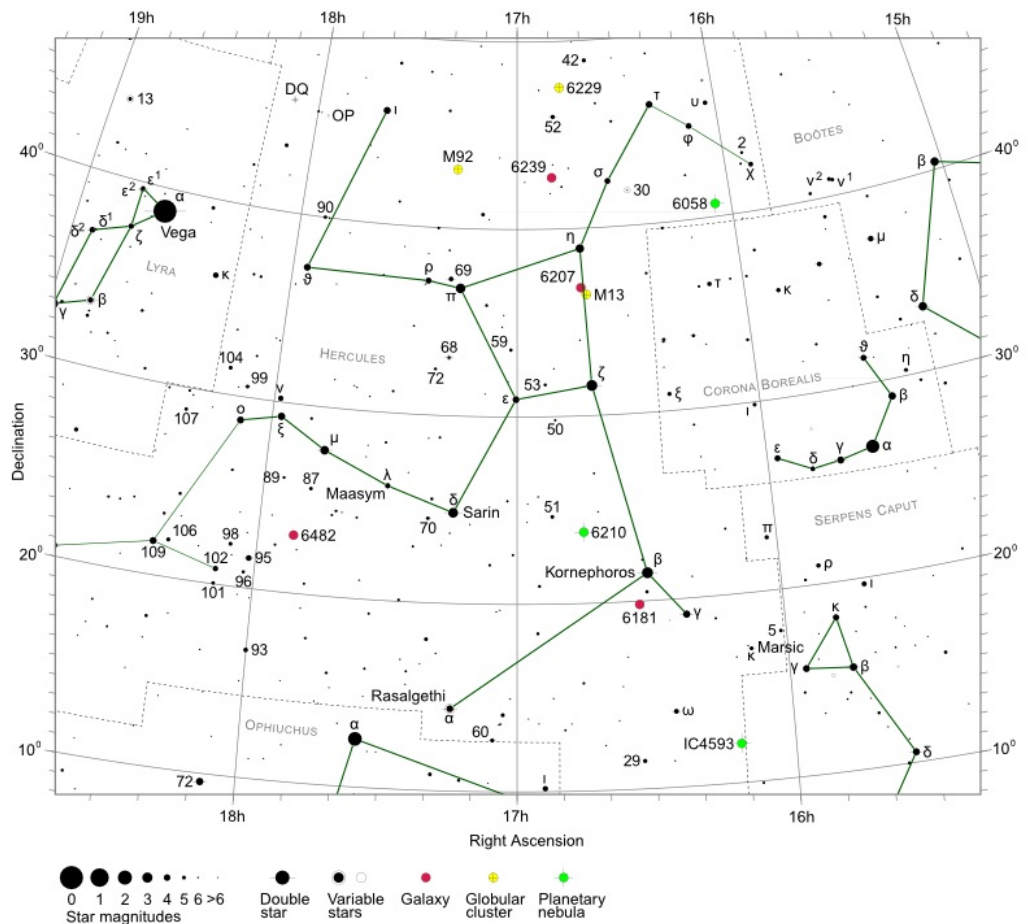
NGC 6058 is located at the 2000.0 coordinates RA 16h04m26.5s and Dec +40°40'58.9". I found it by star-hopping a little less than 3 degrees southeast of the 4.6 magnitude star chi (χ) Herculis. Observing with a 10-inch f/5 reflector under magnitude 5 skies, I noted, "Located in neat Y-shaped asterism. Not seen with 39X. Visible as an out-of-focus star with 139X. Best view with 208X. No sign of color." I was unable to see the magnitude 13.6 central star.

Distances to planetary nebulae are often iffy at best. Recent Gaia data suggest that NGC 6058 is around 9000 light-years away.

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.



Image taken with my 32 inch F6.5 relay telescope, 2.5 hours of imaging time total. NB filters of O3 and H α used, very bright in O3 especially thus the intense blue color. I attempted some S2, but it was a very weak signal, and therefore not used. Combined and processed in Pixinsight. some interesting detail seen.. Mario Motta



Night Sky Notes: Seeing Double

by Kat Troche

During the summer months, we tend to miss the views of Saturn, Jupiter and other heavenly bodies. But it can be a great time to look for other items, like globular star clusters such as Messier 13, open star clusters such as the Coma Star Cluster (Melotte 111), but also [double stars](#)!

What Are Double Stars?

If you have seen any movies or read any books that refer to having two suns in the sky, that would be a double star system. These star systems typically come in two types – binary and optical doubles. Binary stars are two stars that are gravitationally bound and orbit each other, and optical double stars only appear to be close together when viewed from Earth, but in reality, are extremely far apart from another, and are not affected by each other's gravity. With a small telescope, in moderately light polluted skies, summer offers great views of these stellar groupings from the Northern Hemisphere:

- **Double Double:** also known by its technical name, Epsilon Lyrae, this multiple star system appears as one star with naked eye observing. But with a small telescope, it can be split into 'two' stars. A large telescope reveals Epsilon Lyrae's secret – what looks like a single star is actually a quadruple star system!

- **Albireo:** a gorgeous double star set – one blue, one yellow – in the constellation Cygnus.

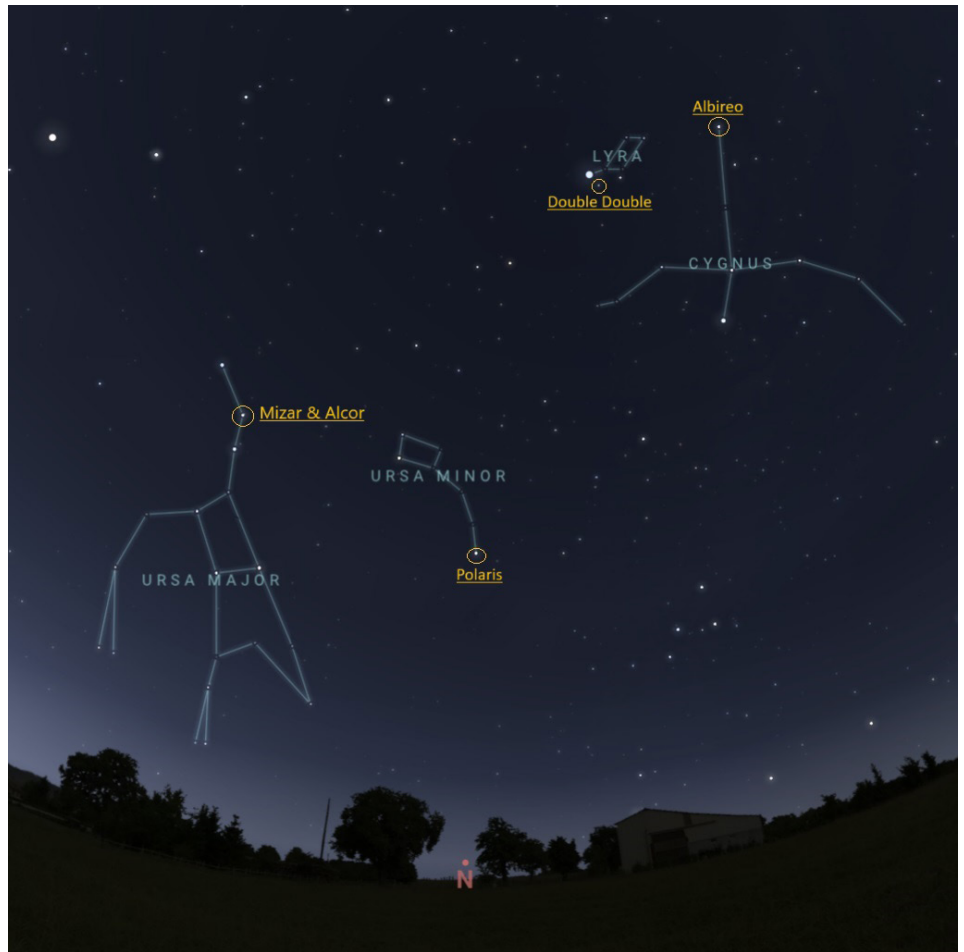
- **Polaris:** while technically a multiple star system, our North Star can easily be separated from one star to two with a modest telescope.

- **Mizar and Alcor:** located in the handle of the Big Dipper, this pair can be seen with the naked eye.

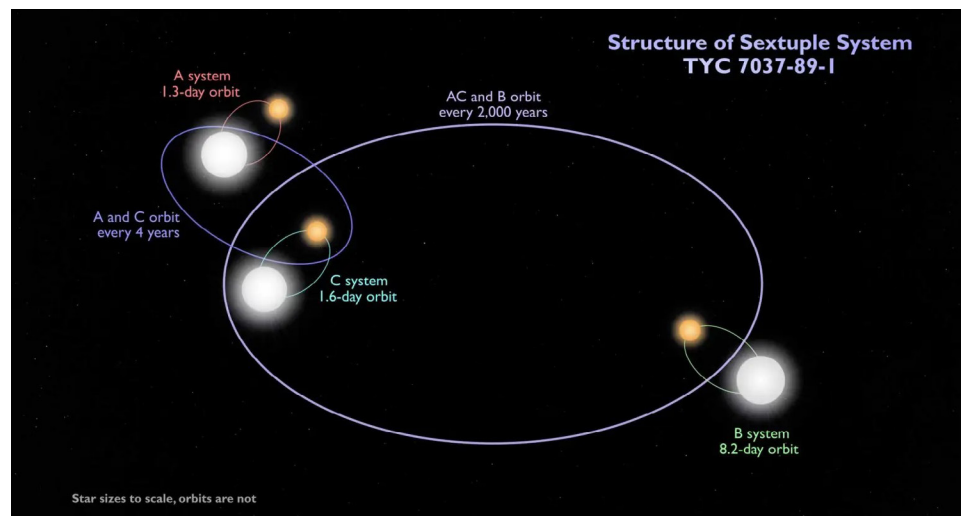
Aside from looking incredible in a telescope or binoculars, double stars help astronomers learn about measuring the mass of stars, and about stellar evolution. Some stars orbit each other a little too closely, and [things can become disastrous](#), but overall, these celestial bodies make for excellent targets and are simple crowd pleasers.

Up next, learn about the Summer Triangle's hidden treasures on our mid-month article on the Night Sky Network page.

This article is distributed by NASA's



Mid-August night sky constellations with the following multiple star systems highlighted: the Double Double in Lyra, Albireo in Cygnus, Polaris in Ursa Minor, Mizar and Alcor in Ursa Major. Credit: Stellarium Web



This schematic shows the configuration of the sextuple star system TYC 7037-89-1. The inner quadruple is composed of two binaries, A and C, which orbit each other every four years or so. An outer binary, B, orbits the quadruple roughly every 2,000 years. All three pairs are eclipsing binaries. The orbits shown are not to scale. Credit: NASA's Goddard Space Flight Center

Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Vis-

it nightsky.jpl.nasa.gov to find local clubs, events, and more!

The Sun, Moon & Planets in August


This table contains the ephemeris of the objects in the Solar System for each Saturday night in August 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	3	8 54.5	17 25.4	Cnc	-26.8	1891.4	-	-	-	1.015	05:42	12:52	20:01
	10	9 21.2	15 28.4	Cnc	-26.8	1893.3	-	-	-	1.014	05:49	12:51	19:52
	17	9 47.5	13 19.4	Leo	-26.8	1895.7	-	-	-	1.012	05:56	12:50	19:42
	24	10 13.4	11 00.0	Leo	-26.8	1898.3	-	-	-	1.011	06:04	12:48	19:32
	31	10 39.0	8 32.1	Leo	-26.8	1901.2	-	-	-	1.009	06:11	12:46	19:20
Moon	3	7 45.2	25 22.5	Gem	-8.5	1828.1	18° W	2	-	-	04:24	12:20	20:04
	10	13 06.1	-8 59.2	Vir	-11.1	1783.5	61° E	26	-	-	11:47	17:13	22:29
	17	19 19.3	-28 13.8	Sgr	-12.6	1927.1	142° E	90	-	-	18:52	23:25	04:06
	24	1 51.2	12 37.7	Ari	-12.4	1951.6	121° W	76	-	-	21:37	04:42	12:02
	31	8 26.3	23 06.9	Cnc	-9.9	1804.2	35° W	9	-	-	03:22	11:05	18:36
Mercury	3	10 18.2	6 56.1	Leo	1.1	9.7	23° E	24	0.461	0.698	07:46	14:13	20:39
	10	10 13.5	6 08.4	Sex	2.1	10.7	16° E	11	0.442	0.630	07:16	13:39	20:03
	17	9 55.5	7 35.9	Leo	3.5	11.1	6° E	2	0.412	0.609	06:24	12:53	19:23
	24	9 36.4	10 34.6	Leo	2.8	10.2	9° W	5	0.373	0.662	05:27	12:07	18:49
	31	9 34.5	12 56.2	Leo	0.8	8.5	16° W	24	0.334	0.795	04:50	11:40	18:31
Venus	3	10 00.6	13 46.0	Leo	-3.8	10.4	16° E	96	0.720	1.634	07:05	13:59	20:51
	10	10 33.4	10 39.9	Leo	-3.8	10.5	18° E	95	0.720	1.610	07:23	14:04	20:44
	17	11 05.4	7 20.1	Leo	-3.8	10.7	20° E	94	0.721	1.583	07:39	14:08	20:36
	24	11 37.0	3 50.8	Leo	-3.8	10.9	22° E	93	0.722	1.554	07:56	14:12	20:27
	31	12 08.2	0 16.0	Vir	-3.8	11.1	24° E	91	0.723	1.522	08:13	14:16	20:18
Mars	3	4 29.4	21 14.4	Tau	0.9	5.9	62° W	89	1.431	1.588	01:02	08:26	15:51
	10	4 49.2	21 58.8	Tau	0.8	6.0	64° W	89	1.439	1.553	00:51	08:19	15:47
	17	5 08.8	22 33.9	Tau	0.8	6.2	66° W	88	1.447	1.516	00:40	08:11	15:41
	24	5 28.2	23 00.0	Tau	0.8	6.3	69° W	88	1.455	1.477	00:30	08:02	15:35
	31	5 47.2	23 17.5	Tau	0.7	6.5	71° W	88	1.463	1.437	00:20	07:54	15:28
1 Ceres	3	18 40.6	-30 38.1	Sgr	7.9	0.6	147° E	99	2.913	2.010	18:38	22:33	02:28
	10	18 36.9	-30 46.9	Sgr	8.0	0.6	140° E	99	2.916	2.070	18:08	22:02	01:56
	17	18 34.5	-30 51.9	Sgr	8.2	0.6	132° E	98	2.92	2.140	17:39	21:32	01:26
	24	18 33.5	-30 53.6	Sgr	8.3	0.6	126° E	98	2.923	2.218	17:10	21:04	00:58
	31	18 33.7	-30 52.6	Sgr	8.4	0.5	119° E	98	2.927	2.302	16:43	20:37	00:31
Jupiter	3	4 54.2	21 52.8	Tau	-2.0	35.6	56° W	99	5.036	5.526	01:23	08:50	16:17
	10	4 59.2	22 00.4	Tau	-2.0	36.2	62° W	99	5.038	5.435	01:00	08:28	15:55
	17	5 03.9	22 06.9	Tau	-2.0	36.8	68° W	99	5.040	5.339	00:37	08:05	15:33
	24	5 08.2	22 12.3	Tau	-2.1	37.6	73° W	99	5.042	5.239	00:13	07:41	15:10
	31	5 12.0	22 16.7	Tau	-2.1	38.3	79° W	99	5.044	5.135	23:49	07:18	14:46
Saturn	3	23 21.0	-6 29.6	Aqr	0.8	18.7	143° W	100	9.676	8.850	21:39	03:17	08:56
	10	23 19.6	-6 40.1	Aqr	0.8	18.9	150° W	100	9.674	8.785	21:10	02:48	08:26
	17	23 18.0	-6 51.6	Aqr	0.7	19.0	157° W	100	9.671	8.732	20:42	02:19	07:57
	24	23 16.2	-7 03.9	Aqr	0.7	19.0	164° W	100	9.669	8.693	20:13	01:50	07:26
	31	23 14.3	-7 16.7	Aqr	0.6	19.1	171° W	100	9.667	8.669	19:41	01:16	06:52
Uranus	3	3 38.6	19 12.4	Tau	5.8	3.6	74° W	100	19.579	19.829	00:19	07:34	14:49
	10	3 39.3	19 14.5	Tau	5.8	3.6	81° W	100	19.577	19.713	23:52	07:07	14:23
	17	3 39.7	19 15.9	Tau	5.7	3.6	87° W	100	19.576	19.595	23:25	06:40	13:56
	24	3 40.0	19 16.9	Tau	5.7	3.6	94° W	100	19.575	19.477	22:58	06:13	13:28
	31	3 40.1	19 17.3	Tau	5.7	3.6	101° W	100	19.574	19.359	22:31	05:46	13:01
Neptune	3	0 00.9	-1 19.6	Psc	7.8	2.3	131° W	100	29.898	29.216	22:00	03:57	09:54
	10	0 00.4	-1 22.8	Psc	7.8	2.3	138° W	100	29.898	29.133	21:32	03:29	09:26
	17	23 59.9	-1 26.4	Psc	7.8	2.4	145° W	100	29.898	29.061	21:04	03:01	08:58
	24	23 59.4	-1 30.4	Psc	7.8	2.4	152° W	100	29.898	29.001	20:36	02:33	08:30
	31	23 58.7	-1 34.6	Psc	7.8	2.4	159° W	100	29.897	28.953	20:09	02:05	08:01
Pluto	3	20 14.3	-23 10.7	Cap	14.4	0.2	169° E	100	35.069	34.073	19:35	00:07	04:40
	10	20 13.6	-23 13.3	Cap	14.4	0.2	162° E	100	35.074	34.107	19:07	23:39	04:11
	17	20 13.0	-23 15.6	Cap	14.4	0.2	155° E	100	35.079	34.155	18:39	23:11	03:43
	24	20 12.4	-23 17.8	Cap	14.4	0.2	149° E	100	35.083	34.216	18:11	22:43	03:15
	31	20 11.9	-23 19.7	Cap	14.4	0.2	142° E	100	35.088	34.289	17:43	22:15	02:47

Lunar Occultation of Spica July 13, 2024



A lunar occultation of Spica was visible from Longboat Key Sarasota, Florida (27° 20' 58.24"N and 82° 36' 19.04"W) on July 13, 2024 at 11:42:21.897 pm local time or July 14, 2024 03h 42m 21.897 sec Universal Time. The moon was a waxing gibbous at 52% phase and only 20 degrees above the horizon just before disappearance. The sky conditions were less than ideal with light clouds and haze which prevented a clear view of the earthshine. Fortunately, the seeing was above average. Telescope was a Meade 60mm refractor 260mm fl at f/4 with an Orion EQ tracking tripod. A ZWO ASI462MM monochrome camera with an Optolong UV-IR cut filter and Firecapture v2.7.14 software were utilized to acquire the video. The apparatus was connected to an MSI GF65 gaming computer. Individual frames from the video were extracted using DVD VideoSoft JPG converter v5.0.101 build 201. Slight sharpening with Photoshop CS4. The moon was slightly overexposed to emphasize the star. This frame is a mirror-image since the refractor utilized a diagonal prism. Gregory T. Shanos

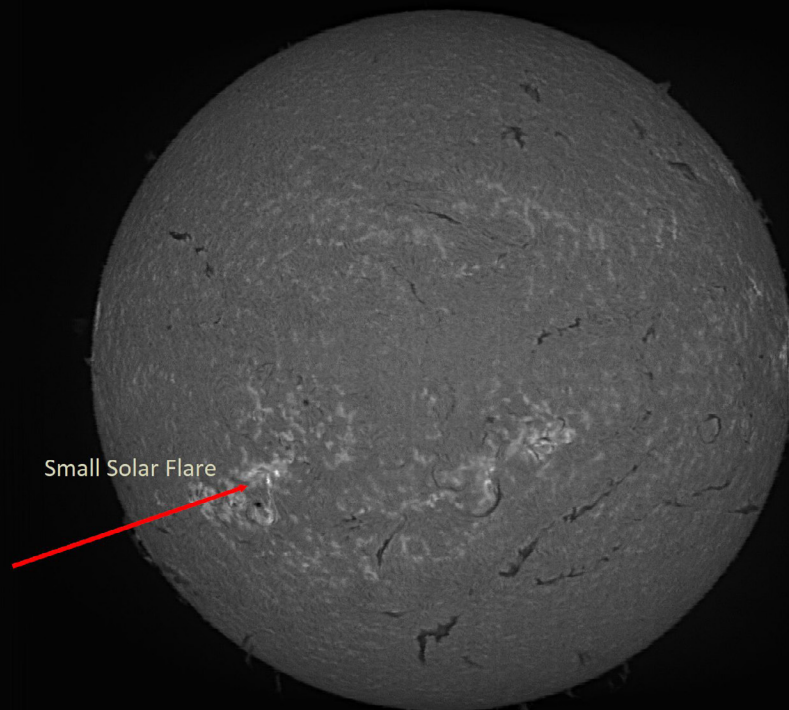


This is the next frame which occurred 0.047 seconds later when Spica was occulted by the moon. Note the accuracy of the embedded time 0.047 seconds! Unfortunately the moon was below the horizon for the reappearance of the star. Gregory T. Shanos MSI GF65 gaming computer. Individual frames from the video were extracted using DVD VideoSoft JPG converter v5.0.101 build 201. Slight sharpening with Photoshop CS4. The moon was slightly overexposed to emphasize the star. This frame is a mirror-image since the refractor utilized a diagonal prism. Gregory T. Shanos



M106 in Canes Venatici by Steve Hubbard

Taken June 10, 50 minutes of M 106 in Canes Venatici. 14" Meade F8 SCT with Meade Focal Reducer, ZWO 294MC camera using Sharpcap.



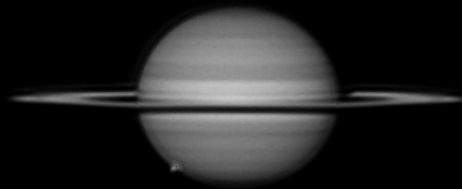
Solar Flare by Conrad Cardano

July 25, 2024 using 3" f/6 apo, Solex spectroheliograph & ASI 294MM camera

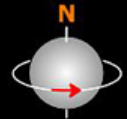
Saturn
July 16, 2024
Titan Approaches Saturn

Gregory T. Shanos Sarasota, FL
Meade LX200GPS 250mm fl 2500mm f/10
ZWO ASI 462 MM monochrome camera
Vernonscope 1.25x Barlow 2850mm f/11
Derotated 6.25 minutes with WinJupos

Magnitude: +1.0
Diameter: 18.3"
Phase: 99.8%
Altitude: 38°
Seeing: 8/10 Very Good
Transparency: 5/10 High Clouds, Hazy
Resolution: 0.21"/pixel



06h 28.9m UT
Baader 610nm R-IR longpass filter
CMI: 210.1° CMII: 31.9° CMIII: 316.0°



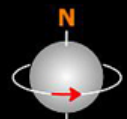
Saturn
July 16, 2024
Dark Transit of Titan

Gregory T. Shanos Sarasota, FL
Meade LX200GPS 250mm fl 2500mm f/10
ZWO ASI 462 MC one-shot color camera
Vernonscope 1.25x Barlow 2900mm f/11
Derotated 6.25 minutes with WinJupos

Magnitude: +1.0
Diameter: 18.3"
Phase: 99.8%
Altitude: 55°
Seeing: 9/10 Very Good
Transparency: 5/10 High Clouds, Hazy
Resolution: 0.21"/pixel



08h 34.4m UT
Astronomik L2 UV-IR cut filter
CMI: 283.6° CMII: 102.6° CMIII: 26.7°



STARRY SCOOP

Editor: Kaitlynn Goulette



WHAT'S UP

As summer continues, the planets are appearing in the sky earlier in the evening and make for great telescopic targets. Saturn rises shortly after sunset and prepares to become a worthwhile spectacle as it reaches opposition in early September. Jupiter and Mars join the sky shortly after midnight and can be observed in the hours before sunrise high in the east.

This month, we are treated to a wonderful display in the southern sky. Scorpius the scorpion is located just above the horizon with its stinger curving down towards the tree line and Sagittarius can be found close by, containing the famous Teapot asterism. Stretching between these two summer constellations and continuing overhead is the edge-on view of our Milky Way galaxy. Aquila the eagle as well as Cygnus the swan “fly” through the cloud-like band as it stretches downward into the northern sky. These two cosmic birds each contain a bright, first magnitude star, Altair and Deneb respectively. Together with the nearby bright star Vega of the constellation Lyra, they form the Summer Triangle.

Producing up to 100 meteors an hour at its peak, the Perseid meteor shower is expected to put on a great show this month. It runs annually from July 17th to August 24th and peaks on the night of the 12th into the following morning. The first-quarter moon sets at about 11pm, which will make for perfect observing conditions. This shower is best viewed from a dark location after midnight.

Thirty-five years ago on August 23rd, Voyager 2

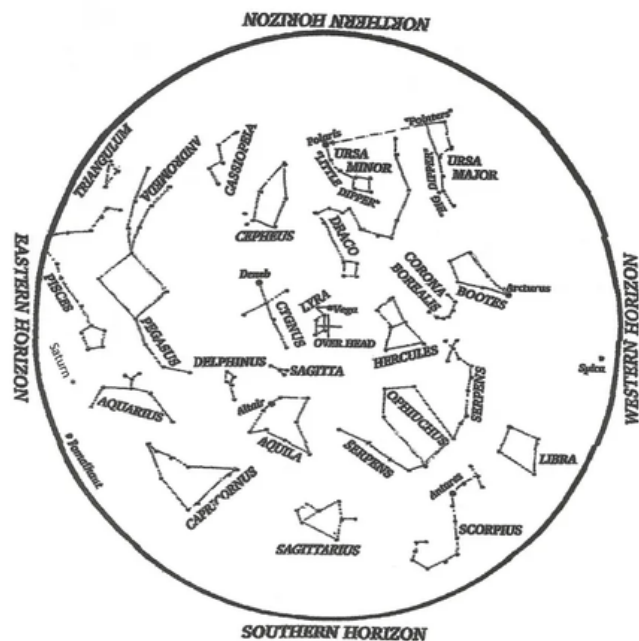
became the first spacecraft to sail past Neptune. This ice giant sits almost 3 billion miles away from the sun and was discovered using math after astronomers noticed disruptions in Uranus’s orbit. After completing its flyby, Voyager 2 began its journey into interstellar space, where it joined Voyager 1. Although Voyager 2 was launched before the other probe, Voyager 1 followed a more direct path out of our Solar System. Today, the twin spacecrafts are still in operation and continue to travel the universe.

AUGUST'S SKY

4: New Moon

12-13: Perseid Meteor Shower Peak

19: Full Moon



Credit: Roger B. Culver

Hold star map above your head and align with compass points.

OBSERVATIONS

The Springfield Science Museum recently hosted SUN-Day, an event centered around observing and learning about the closest star to Earth. The Springfield STARS Club provided their expertise and equipment, and entertained dozens of people on the Quadrangle outside the museum.

A telescope paired with a white-light filter allowed attendees to study the sunspots that dotted the sun's surface. Many children were amazed at the features and even convinced their parents to view them as well. When the eyepiece was crowded, many took part in building UV bead bracelets, which helped demonstrate the power of the sun. The Springfield STARS Club also had tables filled with helpful posters and handouts and used their experience to educate the visitors.

While many were having fun outside, the Springfield Science Museum had a live display of the sun through a hydrogen-alpha-filtered telescope set up inside. The telescope was positioned on the museum's roof and wirelessly streamed its view downstairs with the help of a camera and other technology. The display consisted of a large television screen, which allowed the public to observe the sun's features in immense detail.



The purpose of the Starry Scoop is to communicate current astronomy and space events. If you want to share your observations or get digital copies of the Starry Scoop, contact starryscoop@gmail.com. The Starry Scoop is now on Facebook. Clear skies!

OBJECT OF THE MONTH

The featured object for the month of August is the brilliant double star Albireo. Located in Cygnus, this star marks the eye of the swan constellation. To the unaided eye, it appears to be a single point of light, but with the help of a pair of binoculars or a small telescope, two stars are revealed. Double stars are very common, but Albireo is special due to the stunning color contrast its two components hold. One star shines a bright gold with the other radiating a cool blue.

Find Albireo in the constellation Cygnus, shining at around 3rd magnitude. While binoculars can resolve the two stars comprising Albireo, a small backyard telescope will provide a sharper image.



Photo by Don Goulette



Attendee gazes at the sun through a telescope. Photo by Krystyna Goulette

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