



The Newsletter for Keene Amateur Astronomers

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July 2024

Serpens Nebula



Photo taken by JWST's NIRCам. Image Credit: NASA, ESA, CSA, K. Pontoppidan (NASA's Jet Propulsion Laboratory) and J. Green (Space Telescope Science Institute)

Contents

Editor's Message

Monthly Business Meeting

Astronomy Conventions and Retreats

Things To Do

Alignment of Protostar Jets Observed in Serpens Nebula

Night Sky Network June Webinar - Preparing for International Observe the Moon Night

Observing in July

- Navigating the Mid July Night Sky
- Astronomical League Double Star Challenge
- False Comet

NASA Night Sky Notes - July's Night Sky Notes: A Hero, a Crown, and Possibly a Nova!

Editor's Message

July offers many exciting viewing opportunities. The warmer weather provides comfortable late night and early morning viewing. An exciting opportunity this year is the much anticipated "Blaze Star" which is expected to go nova this summer. T Coronae Borealis is one of a few known stars to go nova on a regular basis. Once it does, it will be visible with the naked eye for a few nights. Be sure to check out the NASA Night Sky Notes at the end of the newsletter to read more about it.

Included in this newsletter are a number of opportunities to get involved in astronomy by attending a retreat, Stellafane, or participate online in one of the opportunities listed. I have participated a number of times in the Globe At Night Campaign. I highly recommend contributing to this database to help measure and track how dark our night skies are.

I hope you enjoy this month's newsletter and have an opportunity to get outside to see the night sky.

- Susan R. Rolke

Monthly Business Meeting

Please see the Minutes for details regarding the June meeting. Seven of us met at the observatory and observed the Quarter Moon. Due to unexpected cold temperatures, observing ended early.

The next meeting will be held on July 12th at the Observatory in Sullivan at 7 pm. Observing to follow the monthly meeting, weather permitting.

Astronomy Conventions & Retreats

[Adirondack Astronomy Retreat](#) in Lewis NY. Retreat #1 starts July 28th

[Stellafane](#) Convention 2024 in Springfield VT starting August 1st

Things To Do

- Try your hand at [NASA's 2024 Summer Astrophoto Challenge](#)
 - This astrophoto challenge provides you with the opportunity to try your hand at creating your own image of Cassiopeia A (Cas A). You have your choice of using James Webb Space Telescope data, the MicroObservatory robotic telescope network to capture your own image, or work with a set of data files taken with multi-wavelength space-based missions from NASA, ESA, and CSA (Hubble, Webb, Chandra, Spitzer). A series of video tutorials on how to manipulate the data in JS9 are provided. Submissions end July 31, 2024. Learn more: <https://mo-www.cfa.harvard.edu/OWN/astrophoto/index.html>
 - Be part of [Globe At Night's Campaign](#) to measure how dark your night sky is
 - To be part of this program and contribute data to the campaign, go to <https://globeatnight.org/> Observations can be made from July 26th to August 4th of either Hercules or Cynus using their charts which display stars at different magnitudes. The larger the number, the darker the sky and the more stars are visible. Each month during the New Moon you can participate in their program to monitor the amount of light pollution in the night sky.
 - [Competition to Name a Quasi-Moon](#)
 - The International Astronomical Union and WNYC's science podcast, Radiolab, invite you to participate in naming one of Earth's quasi-Moons. Submissions are open until September 30th. Interested individuals who submit a name are also asked to write a short description.
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Alignment of Protostar Jets Observed in Serpens Nebula

By Susan Rolke

A recently released image taken by the James Webb Space Telescope of the Serpens Nebula provides new evidence to support our understanding of stellar formation. This image is the first to provide evidence that stars that form under similar conditions will rotate in the same direction. This phenomenon has been predicted by astronomers but evidence has eluded scientists.

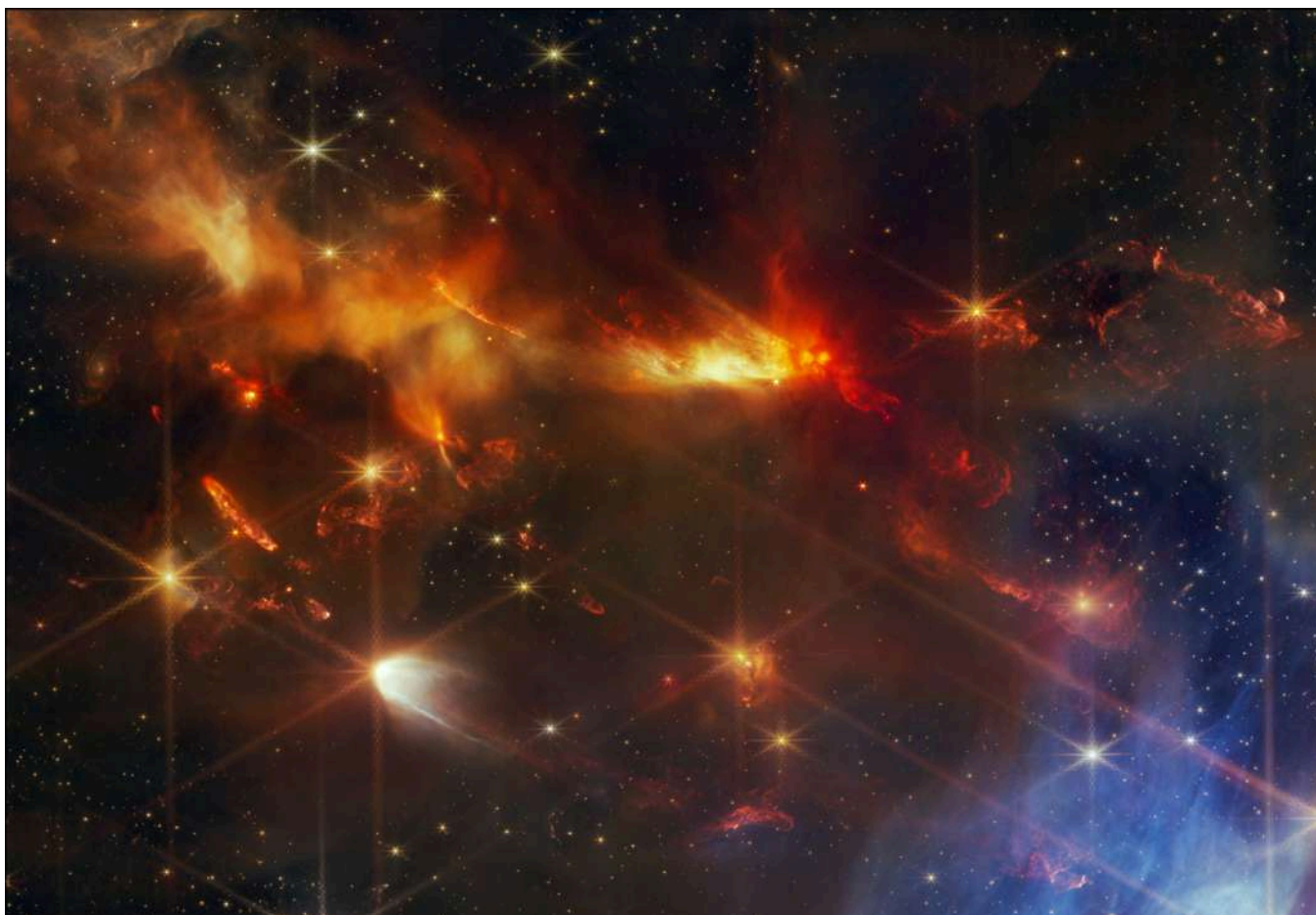


Image Credit: NASA, ESA, CSA, K. Pontoppidan (NASA's Jet Propulsion Laboratory) and J. Green (Space Telescope Science Institute)

Stars form in denser regions of nebulae. New research indicates that when a region of a nebula experiences a shock, it triggers a series of events that results in the collapse of part of the molecular cloud. As the infalling material coalesces to form a protostar, some of the material is ejected perpendicular to the rotation of spin as protostellar jets. These outflows serve as tell-tale signatures of protostars and also provide scientists the ability to determine their axes of spin.

Researchers focused on a series of protostars in the upper left of the image that seem to have formed in an isolated region of the Serpens Nebula approximately 100,000 years ago which makes them extremely young

protostars. Of the 12 protostellar jets identified and analyzed in the Northwest region, it was determined that their spin aligns closely to each other and to the region in which they formed. Additionally, two disk shadows in the central region also exhibit the same axis of rotation.

When I first saw the image which was featured as NASA's Astronomy Picture of the Day on June 27th, I wasn't entirely certain what I was supposed to be looking at. Maybe it's me but it wasn't clear exactly what the researchers saw and based their claim on. Perhaps you had this issue as well?

I decided to dig into this a little deeper and found a nice tour of the Serpens Nebula posted on the Webb Space Telescope page which illustrated the location of some of the jets. I highly recommend watching the [video](#).



Image Credit NASA, ESA, CSA, STScI from A Tour of the Serpens Nebula [video](#)

Previously, images taken at the visible wavelengths were unable to penetrate the dust in the nebula. The image taken by JWST's Near Infrared Camera (NIRCam) is ideal for finding protostars because it can see through the dust and detect molecular hydrogen and carbon monoxide in the outflowing jets emitted by protostars. Molecular hydrogen and carbon monoxide emit a unique wavelength in the infrared. Because the image was taken in the infrared, it is artificially colored. Molecular hydrogen (H₂) and carbon monoxide in the jets have been artificially colored red.

This image provides valuable information regarding stellar formation. While astronomers have predicted the alignment of spin, it has been difficult to detect due to the fact that the alignment deteriorates as the result of other interacting forces such as binary interactions and precession. These stars are very young and as a result still exhibit the rotation of their parent cloud.

It is of interest that the paper submitted by the researchers also used SOFIA HAWC+ archival polarization dust data of the Serpens Nebula to study the magnetic field which is known to play a key role in stellar formation. The magnetic field data was aligned with the protostars studied. This information allowed them to determine the rotation of the parent cloud. The researchers indicate that this section of the nebula is isolated and subsequent orientation of the spin of the protostars is due to the magnetic field present.

If you are interested in reading the research paper, you can find it [here](#).

Night Sky Network Online Webinar

The Night Sky Network hosts monthly webinars for members to learn more about space and current research. If you are looking to watch a presentation you missed, you can view a recording at [Night Sky Network's youtube channel](#).

The program is taking a break for the month of July but will be back on Wednesday August 7, at 9:00 PM Eastern with information about the International Observe the Moon Night.

Andrea Jones and Caela Barry from NASA's Goddard Space Flight Center and Theresa Summer from the Astronomical Society of the Pacific will provide information on how you can get involved and go over available resources to help host this event. Information regarding new Moon maps, shareable promotional materials, hands-on activities as well as tips to host and event will be discussed. They also look forward to participants sharing their own ideas for event planning.

Observing

To find out skywatching tips for June, click on the following links (in blue and underlined) to learn more.

- Video: [What's Up July 2024 Skywatching Tips from NASA](#)

Click here for a larger image [July 2024](#)

Navigating the mid July Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid July at 11 p.m. or late July 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 July night sky: Simply start with what you know or with what you can easily find.

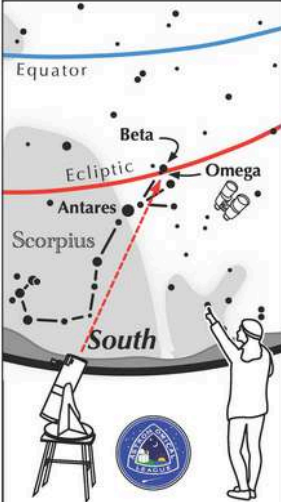
- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the July evening sky, then continues to Spica. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 3 To the northeast of Arcturus shines another star of similar 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: 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 Antares and Altair, hides an area containing many star clusters and nebulae.
- C: On the western side of the Keystone glows the Great Hercules Cluster, containing nearly 1 million stars.
- D: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- E: Sweep along the Milky Way for an astounding number of faint glows and dark bays, including the Great Rift.

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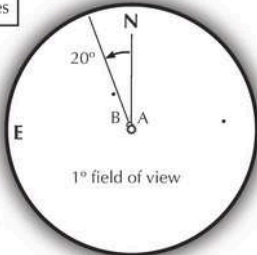
ASTRONOMICAL LEAGUE Double Star Challenge



Other Suns: Beta Scorpii
How to find Beta Scorpii on a July evening
 Find the bright red star Antares low in the south. To its west shine three stars representing the claws of Scorpius. The northern star is Beta Scorpii. Immediately below Beta lies Omega, a very wide optical double star, easily separated in binoculars.


Suggested magnification: >40x
 Suggested aperture: >3 inches

Beta Scorpii
 A-B separation: 14 sec
 A magnitude: 2.6
 B magnitude: 4.5
 Position Angle: 20°
 A & B colors: white & blue




1° field of view

Click to see larger image: [Beta Scorpii](#)

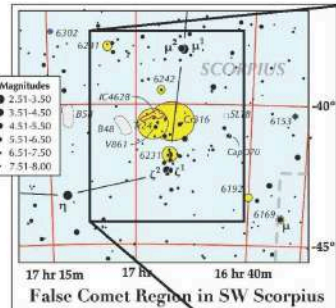


Often ignored because of its southerly declination, this is a great region for binocular observers and telescope users!



False Comet, a closer look

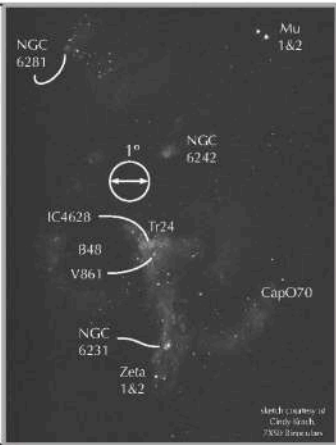
Take your time and explore what this area offers: Open clusters, double stars, variable stars, dark nebulae, emission nebula, & planetary nebulae.



False Comet Region in SW Scorpius

Features to Identify

- Zeta 1 & 2, and Mu 1 & 2, binocular double stars.
- NGC 6231 (Caldwell 76), open cluster.
- Trumpler 24: open cluster, 8.6 mag., 60'
- Collinder 316: Large open cluster.
- B 48 & B 58: dark nebulae
- NGC 6242: open cluster, 6.5 mag., 40'
- NGC 6281: open cluster, 5.4 mag., 8'
- NGC 6302: planetary nebula, "Bug," 9.2 mag., 50'.
- V861: eclipsing binary with period of 7.85 days, 6.1 to 6.4 mag.
- IC 4628: emission nebula, the "Prawn."
- CapO70: binocular double star, 6.1 & 6.2 mag., 97" sep.



A great region for binoculars!

- 7x50 and 10x50 work nicely.
- Best when mounted on a tripod for steady viewing.
- Best to have high contrast, dark skies.

See more detail:

- Use a high contrast or deep sky nebula filter.
- Don't forget to try high magnification, >200.

Try your hand at sketching: Lay down the bright stars first to set relative distances, lightly outline bright nebula next, then fill in cluster stars and dimmer field stars. Add shading. Note dark areas. The more you look, the more you see!

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Click to see larger image: [A False Comet](#)

NASA Night Sky Notes, July 2024



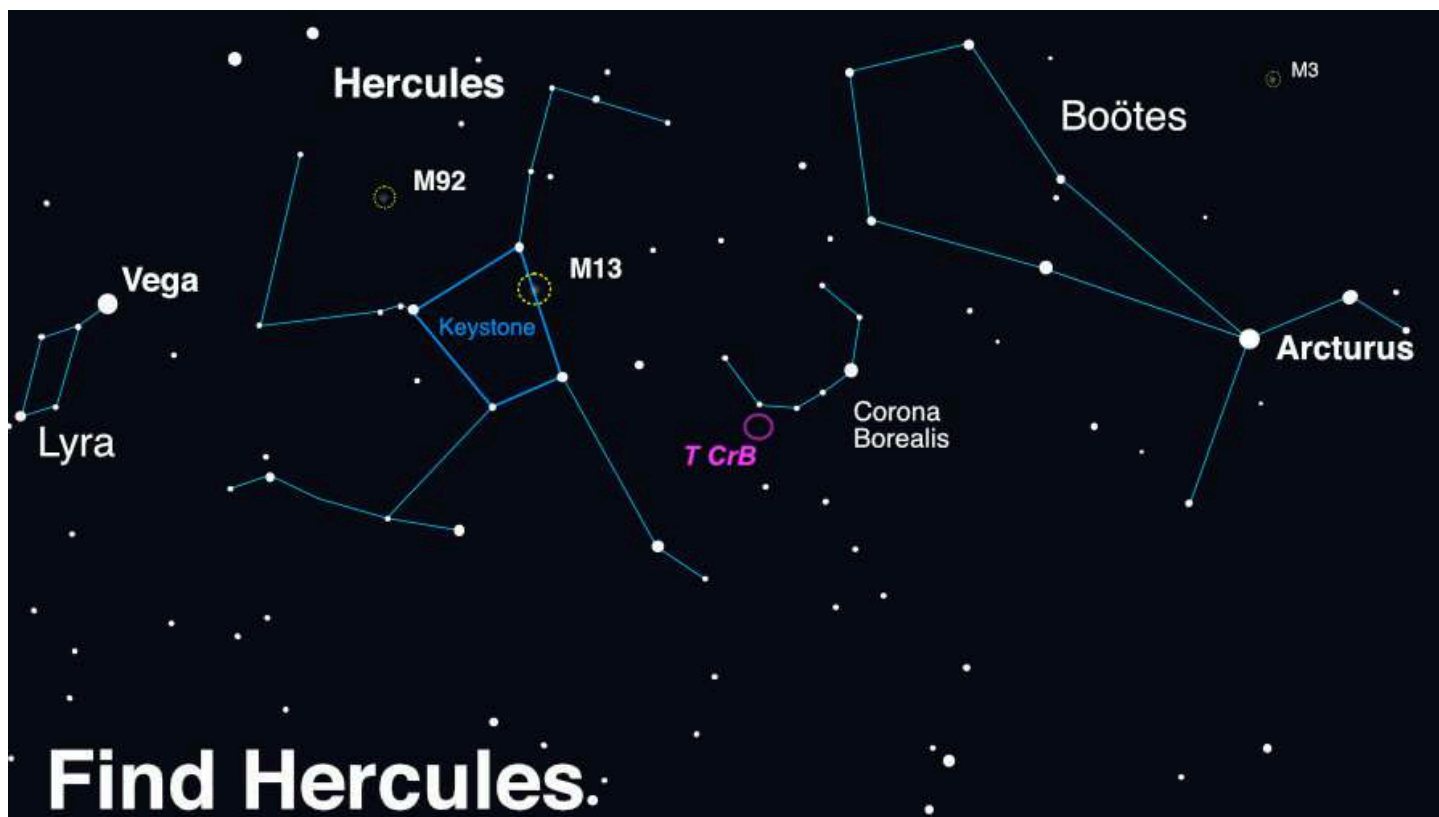
This article is distributed by NASA's Night Sky Network (NSN).

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!

July's Night Sky Notes: A Hero, a Crown, and Possibly a Nova!

By Vivian White

High in the summer sky, the constellation Hercules acts as a centerpiece for late-night stargazers. At the center of Hercules is the "Keystone," a near-perfect square shape between the bright stars Vega and Arcturus that is easy to recognize and can serve as a guidepost for some amazing sights. While not the brightest stars, the shape of the hero's torso, like a smaller Orion, is nearly directly overhead after sunset. Along the edge of this square, you can find a most magnificent jewel - the Great Globular Cluster of Hercules, also known as [Messier 13](#).



Look up after sunset during summer months to find Hercules! Scan between Vega and Arcturus, near the distinct pattern of Corona Borealis. Once you find its stars, use binoculars or a telescope to hunt down the globular clusters M13 (and a smaller globular cluster M92). If you enjoy your views of these globular clusters, you're in luck - look for another great globular, M3, in the nearby constellation of Boötes. Image created with assistance from Stellarium: stellarium.org

Globular clusters are a tight ball of very old stars, closer together than stars near us. These clusters orbit the center of our Milky Way like tight swarms of bees. One of the most famous short stories, [Nightfall](#) by Isaac Asimov, imagines a civilization living on a planet within one of these star clusters. They are surrounded by so

many stars so near that it is always daytime except for once every millennium, when a special alignment (including a solar eclipse) occurs, plunging their planet into darkness momentarily. The sudden night reveals so many stars that it drives the inhabitants mad.

Back here on our home planet Earth, we are lucky enough to experience [skies full of stars](#), a beautiful [Moon](#), and regular [eclipses](#). On a clear night this summer, take time to look up into the Keystone of Hercules and follow this sky chart to the Great Globular Cluster of Hercules. A pair of binoculars will show a faint, fuzzy patch, while a small telescope will resolve some of the stars in this globular cluster.



A red giant star and white dwarf orbit each other in this animation of a nova similar to T Coronae Borealis. The red giant is a large sphere in shades of red, orange, and white, with the side facing the white dwarf the lightest shades. The white dwarf is hidden in a bright glow of white and yellows, which represent an accretion disk around the star. A stream of material, shown as a diffuse cloud of red, flows from the red giant to the white dwarf. When the red giant moves behind the white dwarf, a nova explosion on the white dwarf ignites, creating a ball of ejected nova material shown in pale orange. After the fog of material clears, a small white spot remains, indicating that the white dwarf has survived the explosion. NASA/Goddard Space Flight Center

Bonus! Between Hercules and the ice-cream-cone-shaped Boötes constellation, you'll find the small constellation Corona Borealis, shaped like the letter "C." Astronomers around the world are watching T Coronae Borealis, also known as the "Blaze Star" in this constellation closely because it is [predicted to go nova sometime this summer](#). There are only 5 known nova stars in the whole galaxy. It is a rare observable event and you can take part in the fun! The Astronomical League has issued a [Special Observing Challenge](#) that anyone can participate in. Just make a sketch of the constellation now (you won't be able to see the nova) and then make another sketch once it goes nova.