



EUGENE ASTRONOMICAL SOCIETY

# Io

August, 2022



PO Box 591 Lowell, OR 97452

[www.eugeneastro.org](http://www.eugeneastro.org)



[1] Dexter Star Party 2022

Alan Gillespie

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Secretary: Randy Beiderwell 541-342-4686

Board: Andrew Edelen, Randy Beiderwell, Ken Martin, Jerry Olton, Dan Beacham

## ***August Meeting***

**Thursday - August 18, 2022 7PM**

To be announced

## ***July Meeting***

We got our terrific talk by Andy about globular clusters! The link to the talk is below:

<https://youtu.be/sq0BCzZeAwc>

### ***Do you have something for the newsletter?***

If you have an article, photo, meeting notes, stories, etc. that you would like to share with the members, please contact me, I'd be happy to add them to the newsletter. If you have photos you would like to submit, I'm trying to include more information about the process and equipment used.

Astrophotographers: I want to offer these pages as a way to not only show off your terrific photos, but to provide us with information on how they are taken and processed. Seeing the amount of work that goes into these amazing images is always fascinating, and makes us appreciate them even more!

Bruce Sackett - [bruce@busymind.net](mailto:bruce@busymind.net)

**Eugene Astronomical Society**

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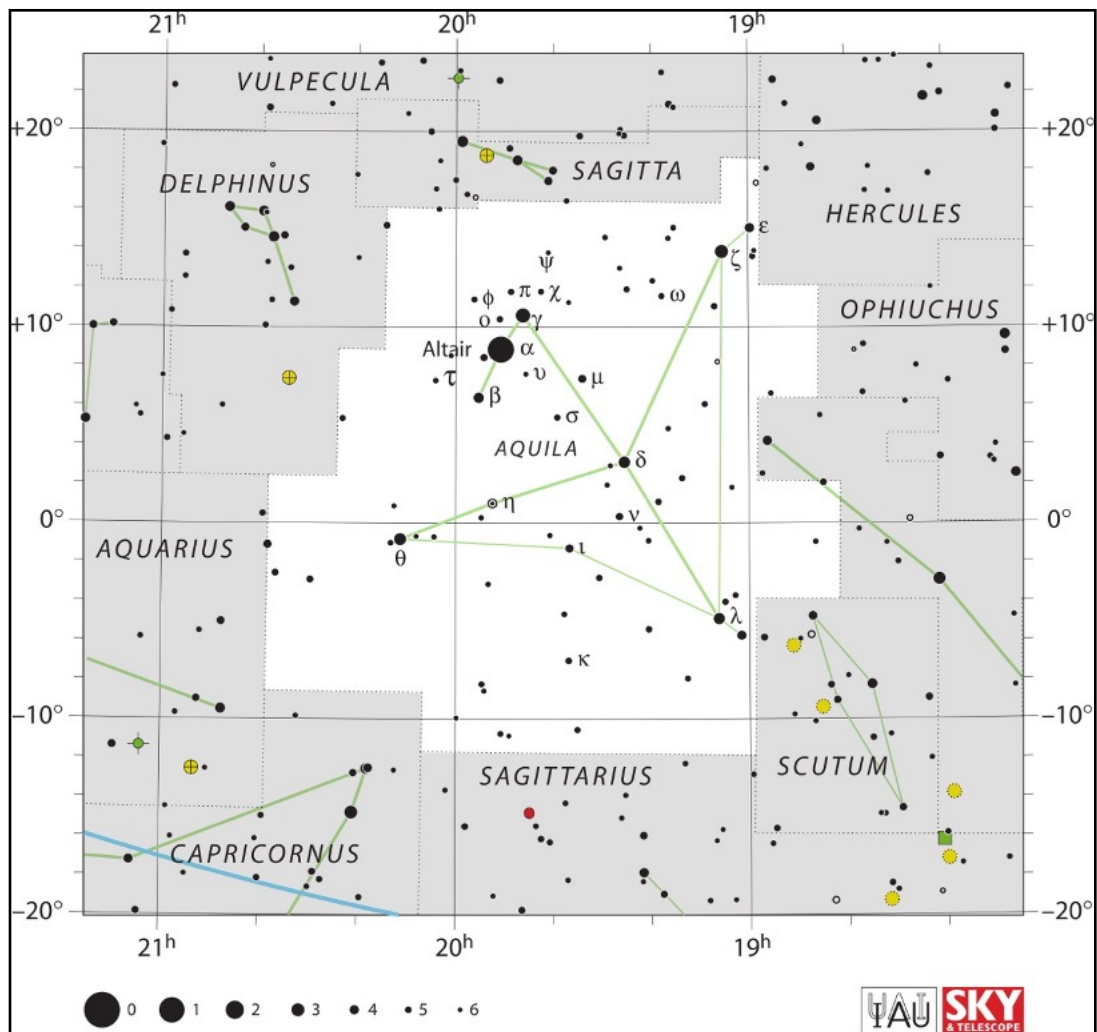
Annual Club Dues \$25

EAS is a proud member of The Astronomical League.

# Constellation of the Month: Aquila

By Andrew Edelen

Riding high in the south as August sunsets fade, Aquila the Eagle rules over some of the densest portions of the Milky Way; yet despite having a first-magnitude star (Altair), an easily-recognizable asterism (made up of Alpha [a], Beta [b], and Gamma [g] Aquilae), and a fairly easy-to-trace overall pattern, Aquila is often overlooked in favor of the more-famous constellations around it. This is due in part to the fact that Aquila's deep-sky objects aren't as flashy as those in neighboring Cygnus, Scutum, Ophiuchus, or even Delphinus. As we'll see, though, there are plenty of objects within the Eagle's borders that are worthy of observing, and doing so won't even require large optics.



Aquila, as seen in modern star charts. Courtesy IAU and Sky & Telescope

Aquila is one of the original 48 constellations recorded by the Hellenic astronomer Ptolemy, who created the first-known star charts. It was passed down to the Greek world by the Babylonians, who saw the constellation as the war-eagle of the god Ninurta (represented by Sagittarius). In the Greek telling, the Eagle belonged to Zeus and bore his thunderbolts when he went off to war; later, Zeus had the

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Eagle kidnap Ganymede to Mt. Olympus to serve as the cup-bearer to the gods. The ancient Hindus saw Aquila as the half-eagle/half-humanoid god Garuda (keeping up the association of the constellation with an eagle), while the ancient Egyptians identified it with the falcon of the god Horus. Intriguingly, Australia's Koori people referred to Altair as Bunjil, the Wedge-Tailed Eagle, marking the constellation's eagle theme across multiple continents.

Two further Greek myths elaborate on the constellation's history: in one, Aquila was the eagle that tore out Prometheus' liver every morning as punishment for Prometheus giving humanity the gift of fire; in the other, it was one of the Stymphalian birds (with Cygnus and Lyra) that Hercules killed as one of his Twelve Labors (hence Hercules sharing a border with Aquila). The constellation of Sagitta, the Arrow, lies nearby, the only one of Hercules' arrows that didn't kill one of the birds.

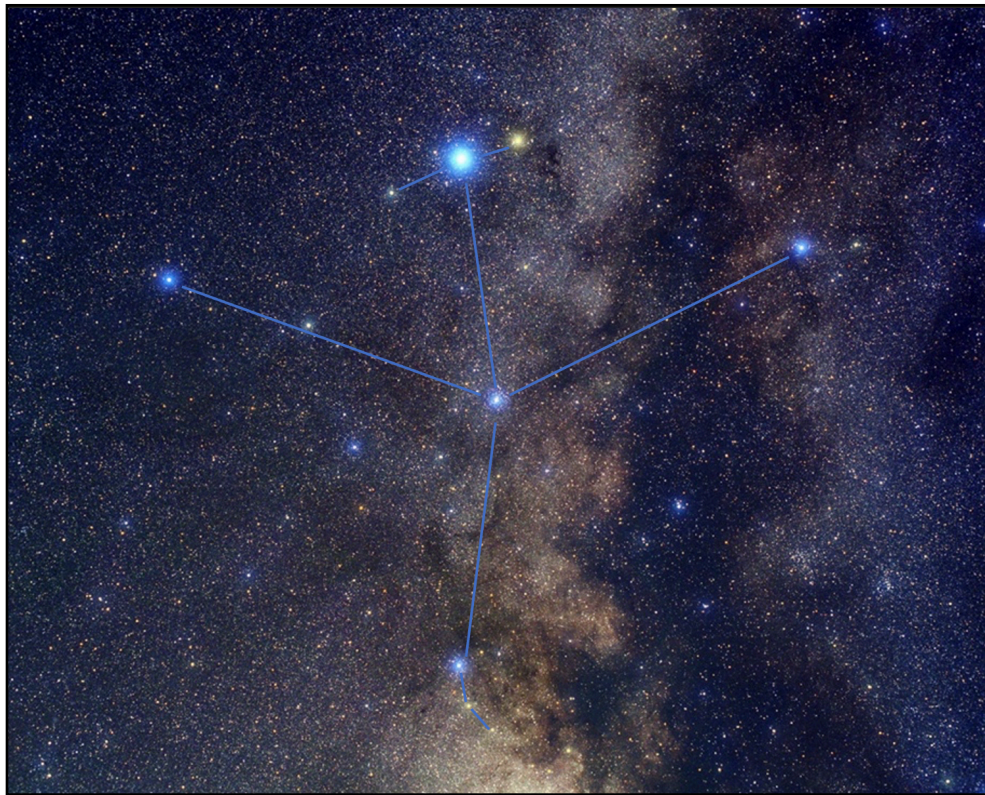
But it's the Chinese and Japanese myth that resonates for us most, due to its visual representation. In both mythologies, Aquila's brightest star, Altair, represents a royal cowherd, keeper of the king's flock; Vega (in nearby Lyra) represents the sun-god's daughter, a weaving-girl. The two became illicit lovers and neglected their duties, and were banished to opposite sides of the celestial river (the Milky Way) for their neglect. However, the other gods took pity on the couple, and allow them to meet every year on the seventh day of the seventh month, a bridge of magpies enabling them to cross the river. But legend has it that it always rains on that evening, caused by the lovers' tears at being forced to part again.

This particular legend is relevant especially for naked-eye astronomers. The Milky Way is dense through Aquila, running the length of the constellation's avian outline (in most older star charts, Altair marks the Eagle's tail; in modern charts, it's usually the Eagle's head), with a dark swath running parallel to (but west of) the Eagle's body. This dark swath is known as the Aquila Rift, part of a longer swath known simply as the Great Rift. The dark material is composed of silicate dusts and organic (carbonaceous) matter that obscures the light from the rich starclouds behind them; from a site well removed from city lights, this juxtaposition of light and dark clouds is one of nature's most awe-inspiring sights—it's easy to see why ancient cultures viewed our galaxy as a river.



## Constellation of the Month: Aquila

By Andrew Edelen



The Eagle and the Rift. The bright cloud at bottom center is the Scutum Star Cloud; Barnard's 'E' can be seen as a tiny dark spot just right of Gamma Aquilae.  
Photo by Bill and Sally Fletcher.

Aquila does not have the eye-catching bright nebulae of Sagittarius and Cygnus, the abundance of globular clusters that Ophiuchus has, or the rich galaxy fields of neighboring Hercules or Aquarius. What it does have are dark nebulae and planetary nebulae in great quantities, due to its position along the Galactic Equator and the Great Rift. We've already discussed the naked-eye view of the Rift, but using a pair of binoculars at a dark site will reveal countless tendrils of dark nebulosity silhouetted against the bright starry background.

Prominent among these—and an easy target for a pair of binoculars—is the pairing of Barnard 142 and 143, two extremely opaque dark nebulae just west of Gamma [g] Aquilae (also known as Terazed). E.E. Barnard was the foremost researcher into the dark splotches that interwove the galaxy's spiral arms; before him, astronomers thought that the dark clouds in the Milky Way were regions actually devoid of stars. Entries 142 and 143 in Barnard's catalog combine to resemble a capital 'E', and are often known collectively as Barnard's E. The two of them can be seen in the Fletcher photograph above as a tiny, almost-opaque spot; in binoculars, their true nature is readily apparent. Users of telescopes should use

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extremely low power to catch these dark nebulae, which are actually quite large in the field and require as much of the starry background as possible to be seen for what they are.

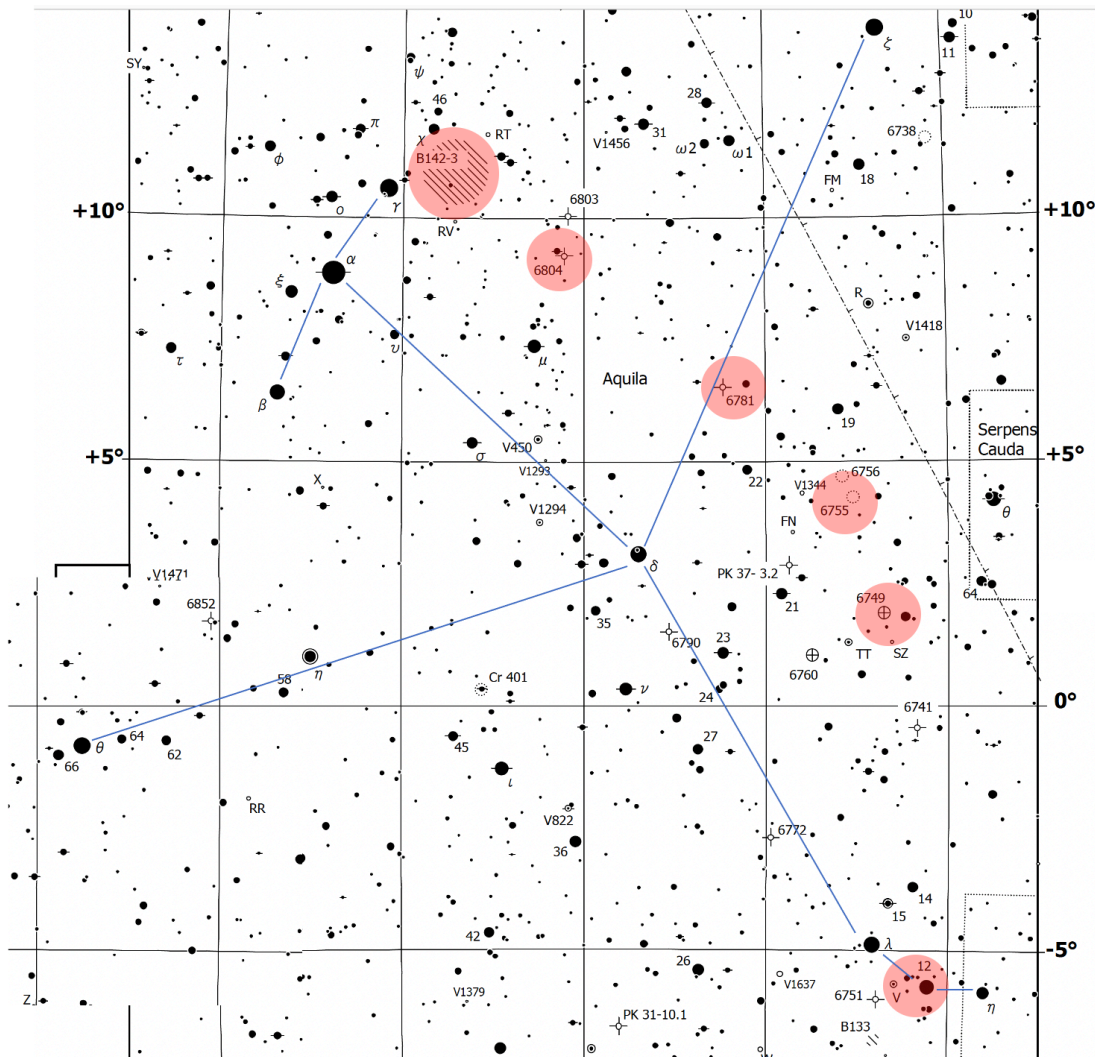


Chart of targets in this month's column. Adapted from Toshimi Taki's Mag 8.5 Star Atlas ([http://takitoshimi.starfree.jp/atlas\\_85/atlas\\_85.htm](http://takitoshimi.starfree.jp/atlas_85/atlas_85.htm))

At the opposite end of the constellation from Barnard's 'E' lies our next target, one suitable for the smallest telescopes. V Aquilae is a carbon star, an unusual type of red giant star whose atmosphere is awash with carbon ash; this ash scatters shorter wavelengths of light but passes the longer wavelengths, which results in the star appearing extremely red. Carbon stars are also always variable in brightness; in the case of V Aquilae, this variability causes the star to waver in brightness from magnitude 6.6 to magnitude 8.4 over a period of 353 days. Carbon stars are usually reddest at their minimum brightness, so keep an eye on V Aql throughout the seasons as its brightness fluctuates.

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Aquila contains a number of open star clusters, but none is particularly impressive. One of the best of these is NGC 6755, which lies about 60% of the way between Delta [d] Aquilae and Theta [q] Serpentis, and a little bit north of that line. NGC 6755 reveals a couple of dozen stars to a 4-inch telescope, and about 40 to a 6-inch. The cluster stands out well from the Milky Way background, spanning about 10' (about a third of the Full Moon's diameter). Successively-larger telescopes will bring greater numbers of stars into view. While you're in the area, check out NGC 6756, a smaller but similar cluster just 30' (a Moon diameter) NNE of NGC 6755.

As mentioned before, Aquila is teeming with planetary nebulae, many of them either tiny or faint. The best of these is NGC 6781, a large (1.5') round planetary which appears annular (ring-like) in larger telescopes. A 6-inch telescope will show the nebula quite clearly; the darker center will probably require an 8-inch scope. The central star—the once-Sun-like star whose cast-off atmosphere forms the nebula—isn't visible in even large telescopes, but several stars may be seen embedded within the nebulosity. NGC 6781 is probably the showpiece deep-sky object in Aquila; look for it about a third of the way between Delta [d] and Zeta [z] Aquilae.

An 8-inch telescope is probably the minimum needed for a good look at NGC 6804, another of Aquila's fine planetaries. Telescopes of that aperture will just reveal the nebula's central star and another star embedded in the NE edge of the nebula's 40"-diameter disk (40 arcseconds, or 40", is 2/3 of one arcminute [or 1'], which is itself 1/30 of the Moon's diameter). NGC 6804 lies just under halfway between Beta [b] and Zeta [z] Aquilae. In my 12.5-inch telescope, the nebula had internal detail that reminded me of a small spiral galaxy; nearby NGC 6803 is a much more difficult object, being nearly indistinguishable from a faint star except at higher powers.

There are three globular clusters in Aquila, one of which was only confirmed to be a globular cluster in 2005. Of the other two, NGC 6749 and NGC 6760, the former is considered the second-faintest globular in the NGC (after NGC 6380 in Scorpius). NGC 6749 is difficult in anything less than a 12-inch scope, and even requires excellent conditions in telescopes of that size. I've seen it with difficulty in my own 12.5-inch scope from a decent site in southern Illinois, but with somewhat more ease from our old Eureka Ridge site. It's a decent-sized globular, about 2.5' in a 12.5-inch scope, but requiring averted vision to hold steadily. NGC 6760 lies 1.75 degrees (3-1/2 Moon widths) to the SE, and is considerably easier to observe.

Aquila may not be the most well-known of the prominent summer constellations, but it has plenty of fascinating sights for astronomers who are willing to do a bit of "off the beaten path" exploring. The Eagle has something for the naked eye, binoculars, and almost every size of telescope; the next time you're wondering what to observe after the celestial wonders in Cygnus or Sagittarius, nudge your observing gear over to Aquila for something new to your stargazing agenda.

## ***Member astrophotography in this issue***

### **[1] Dexter Star Party 2022 by Alan Gillespie**

It was a perfect night. I shot 144 exposures between 10:13pm and 10:59.

Stacked several different ways with Sequator:

- 1) a test draft to see what it would look like,
- 2) stacked for star trails,
- 3) stacked for point stars and Milky Way, and
- 4) stacked for the foreground.

I had to photoshop out two airplanes that would otherwise be too overwhelming. Other than that it all worked out perfectly.



# Observing in August 2022



Aug 5, 4:06 AM	Aug 11, 6:36 PM	Aug 18, 9:36 PM	August 27, 1:17 AM
Mercury Set: 9:23 PM	Mercury Set: 9:16 PM	Mercury Set: 9:04 PM	Mercury Set: 8:43 PM
Venus Rise: 4:18 AM	Venus Rise: 4:31 AM	Venus Rise: 4:48 AM	Venus Rise: 5:10 AM
Mars Rise: 00:21 AM	Mars Rise: 00:08 AM	Mars Rise: 11:53 PM	Mars Rise: 11:33 PM
Jupiter Rise: 10:36 PM	Jupiter Rise: 10:12 PM	Jupiter Rise: 9:44 PM	Jupiter Rise: 9:07 PM
Saturn Rise: 8:53 PM	Saturn Rise: 8:28 PM	Saturn Set: 6:04 AM	Saturn Set: 5:25 AM
Uranus Rise: 00:06 AM	Uranus Rise: 11:43 PM	Uranus Rise: 11:16 PM	Uranus Rise: 10:40 PM
Neptune Rise: 10:06 PM	Neptune Rise: 9:42 PM	Neptune Rise: 9:14 PM	Neptune Rise: 8:39 PM
Pluto Set: 4:42 AM	Pluto Set: 4:17 AM	Pluto Set: 3:49 AM	Pluto Set: 3:13 AM

All times Pacific Daylight Time (March 13 – Nov 5, 2022 = UT -7 hours) or Pacific Standard Time (November 6, 2022 – March 11, 2023 = UT -8 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
8/1/2022	09:53	22:50	03:59	06:01	20:36	22:37
8/2/2022	11:00	23:09	04:01	06:02	20:35	22:35
8/3/2022	12:08	23:30	04:03	06:03	20:34	22:33
8/4/2022	13:18	23:53	04:05	06:04	20:32	22:31
8/5/2022	14:33		04:06	06:05	20:31	22:29
8/6/2022	15:50	00:21	04:08	06:06	20:30	22:27
8/7/2022	17:07	00:56	04:10	06:07	20:28	22:25
8/8/2022	18:20	01:43	04:12	06:08	20:27	22:23
8/9/2022	19:22	02:43	04:14	06:10	20:25	22:21
8/10/2022	20:11	03:57	04:15	06:11	20:24	22:19
8/11/2022	20:50	05:18	04:17	06:12	20:23	22:16
8/12/2022	21:20	06:41	04:19	06:13	20:21	22:14
8/13/2022	21:45	08:02	04:21	06:14	20:20	22:12
8/14/2022	22:07	09:18	04:23	06:15	20:18	22:10
8/15/2022	22:27	10:31	04:24	06:16	20:17	22:08
8/16/2022	22:49	11:42	04:26	06:17	20:15	22:06
8/17/2022	23:11	12:51	04:28	06:19	20:13	22:04
8/18/2022	23:37	13:59	04:30	06:20	20:12	22:01
8/19/2022		15:05	04:31	06:21	20:10	21:59
8/20/2022	00:08	16:09	04:33	06:22	20:09	21:57
8/21/2022	00:45	17:07	04:35	06:23	20:07	21:55
8/22/2022	01:30	17:59	04:36	06:24	20:05	21:53
8/23/2022	02:22	18:43	04:38	06:25	20:04	21:51
8/24/2022	03:22	19:19	04:40	06:27	20:02	21:48
8/25/2022	04:25	19:49	04:41	06:28	20:00	21:46
8/26/2022	05:32	20:14	04:43	06:29	19:59	21:44
8/27/2022	06:38	20:35	04:45	06:30	19:57	21:42
8/28/2022	07:45	20:55	04:46	06:31	19:55	21:40
8/29/2022	08:52	21:15	04:48	06:32	19:53	21:37
8/30/2022	10:00	21:35	04:49	06:34	19:52	21:35
8/31/2022	11:10	21:57	04:51	06:35	19:50	21:33

All times are for Eugene, Oregon Latitude 44° 3' Longitude 123° 06'

## Items of Interest This Month

- 8/5 First Quarter Friday star party.**
- 8/6 Red spot transits (is in middle of Jupiter) 00:55 AM (on night of the 5th).
- 8/10 Red spot transits at midnight.
- 8/11 – 8/13 Perseid meteor shower (much reduced by full Moon).
- 8/12 Europa shadow transit 9:42 PM – 00:18 AM.
- 8/14 Saturn at opposition. Look for Seeliger effect (brightening of rings) in the day or two before and after.
- 8/15 Double shadow transit on Jupiter (Io and Ganymede). Both transits in progress at Jupiter rise. Io's shadow leaves Jupiter 10:38 PM, Ganymede's leaves 11:58 PM. Red spot transits 11:10 PM.
- 8/19 (morning of 8/20) Europa shadow transit 00:18 AM – 2:53 AM.
- 8/22 Io shadow transit 10:18 PM – 00:32 AM. Red spot transits 11:55 PM.
- 8/22 Asteroid Vesta at opposition.
- 8/27 Mercury at greatest eastern elongation (27°). Visible after sunset, but low on horizon.
- 8/27 Red spot transits 11:02 PM.
- 8/29 Red spot transits 00:40 AM on 30th.