Binocular Observing Olympics V

Stellafane 2023 edition

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- To qualify for the BOO pin, you must see 15 of the following 20 binocular targets. Check each off as you spot them.
- Tougher objects are *italicized* on list.

Seen	#	Object	Const	Chart	Type*	RA	Dec	Mag	Size	Nickname/Notes
	1.	Iota Boötis	Boo	1	**	14h 16m	+51° 22′	4.8, 7.3	39"	
	2.	Davis's Dinosaur	Her	2	As	16h 57m	+14° 32′	5 to 8	4°	
	3.	M23	Sgr	3	OC	17h 57m	-18° 59′	5.5	35'	
	4.	*NGC 6572*	Oph	4	PN	18h 12m	+06° 51′	8	6"	Emerald Nebula
	5.	M28	Sgr	3	GC	18h 25m	-24° 52′	6.8	11'	
	6.	M25	Sgr	3	OC	18h 32m	-19° 07′	4.6	36'	
	7.	Teaspoon	Sgr	5	As	19h 15m	-20°	3 to 4	8° x 2°	
	8.	*NGC 6822*	Sgr	5	Gx	19h 45m	-14° 47′	9.3	16'x14'	Barnard's Galaxy
	9.	Le Gentil 3	Cyg	6	DN	21h 00m	+51° 00'	n/a	12° x 2°	Funnel Cloud Nebula
	10.	M2	Aqr	7	GC	21h 33m	-00° 49′	6.5	16'	
	11.	*IC 1396*	Cep	8	BN	21h 39m	+57° 30'	3.5	49'	Elephant Trunk
	12.	79 Cygni	Cyg	9	**	21h 43m	+38° 17′	5.7, 7	149.5"	
	13.	*NGC 188*	Cep	10	OC	00h 48m	+85° 15'	10	15'	
	14.	M33	Tri	11	Gx	01h 34m	+30° 40′	5.7	71' × 42'	Triangulum Pinwheel
	15.	*NGC 604*	Tri	11	BN	01h 35m	+30° 47′	~9	1.9'x1.2'	
	16.	NGC 663	Cas	12	OC	01h 46m	+61° 15′	7.1	16'	
	17.	Polaris Engagement Ring	UMi	10	As	02h 32m	+89° 16'	10	105'	
	18.	M34	Per	13	OC	02h 42m	+42° 46′	5.5	35'	
	19.	Kemble's Cascade	Cam	14	As	03h 57m	+63°	5 to 10	120'	
	20.	NGC 1502	Cam	14	OC	04h 08m	+62° 19′	6	10'	Jolly Roger Cluster

Key

**	Binary star	BN	Bright nebula	Gx	Galaxy	OC	Open cluster
As	Asterism	DN	Dark nebula	GC	Globular cluster	PN	Planetary nebula

I would enjoy hearing how you make out with this year's list? And would you like to see a new BOO 2024 list next year? Drop me a line through my web site, philharrington.net, and let me know. Good luck. And remember, two eyes are better than one!

All-Sky Star Chart

(Chart drawn for 10:00 PM)

1 Circled areas correspond to the chart numbers found on the pages that follow and represent the recommended finding sequence.

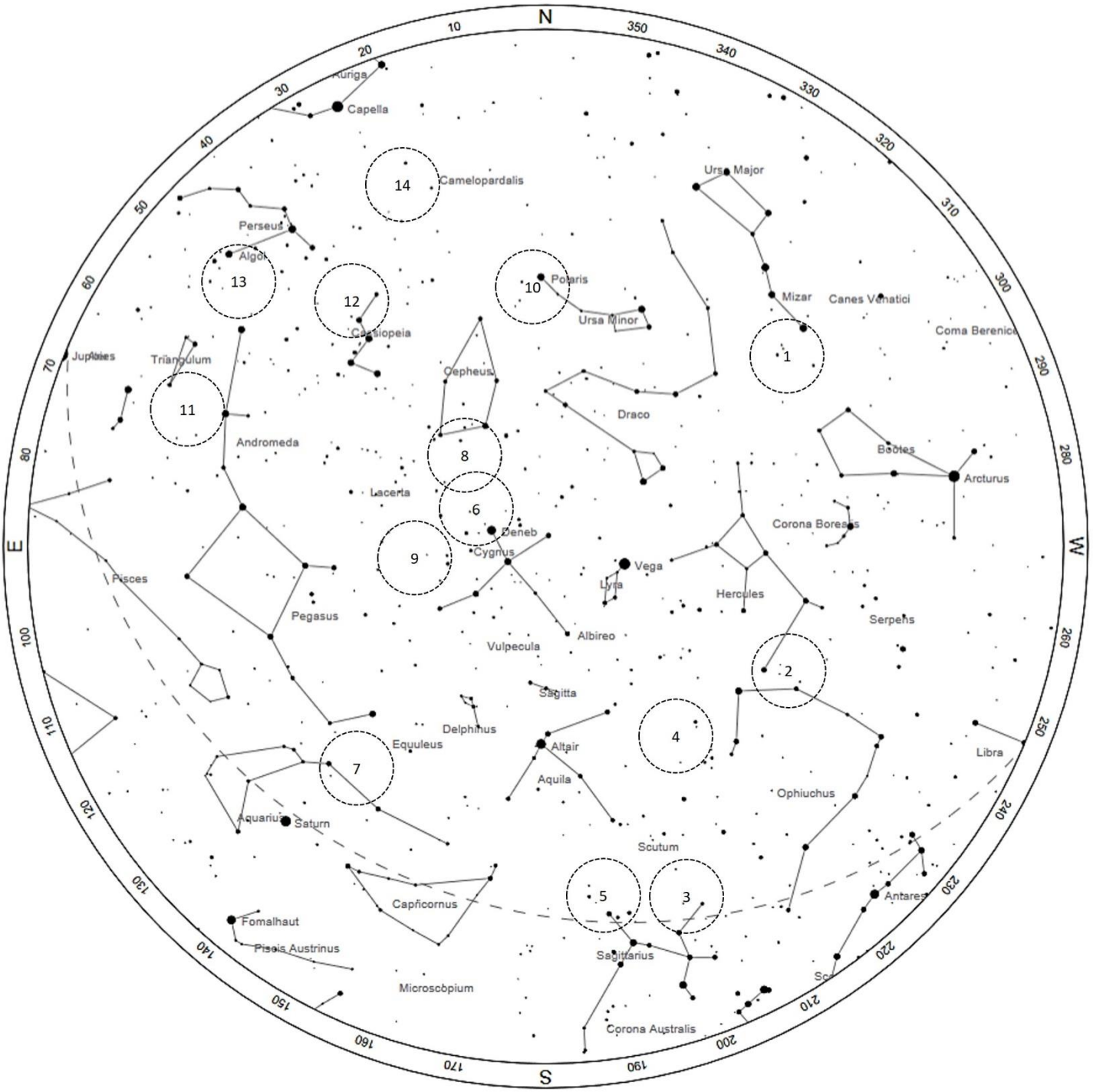
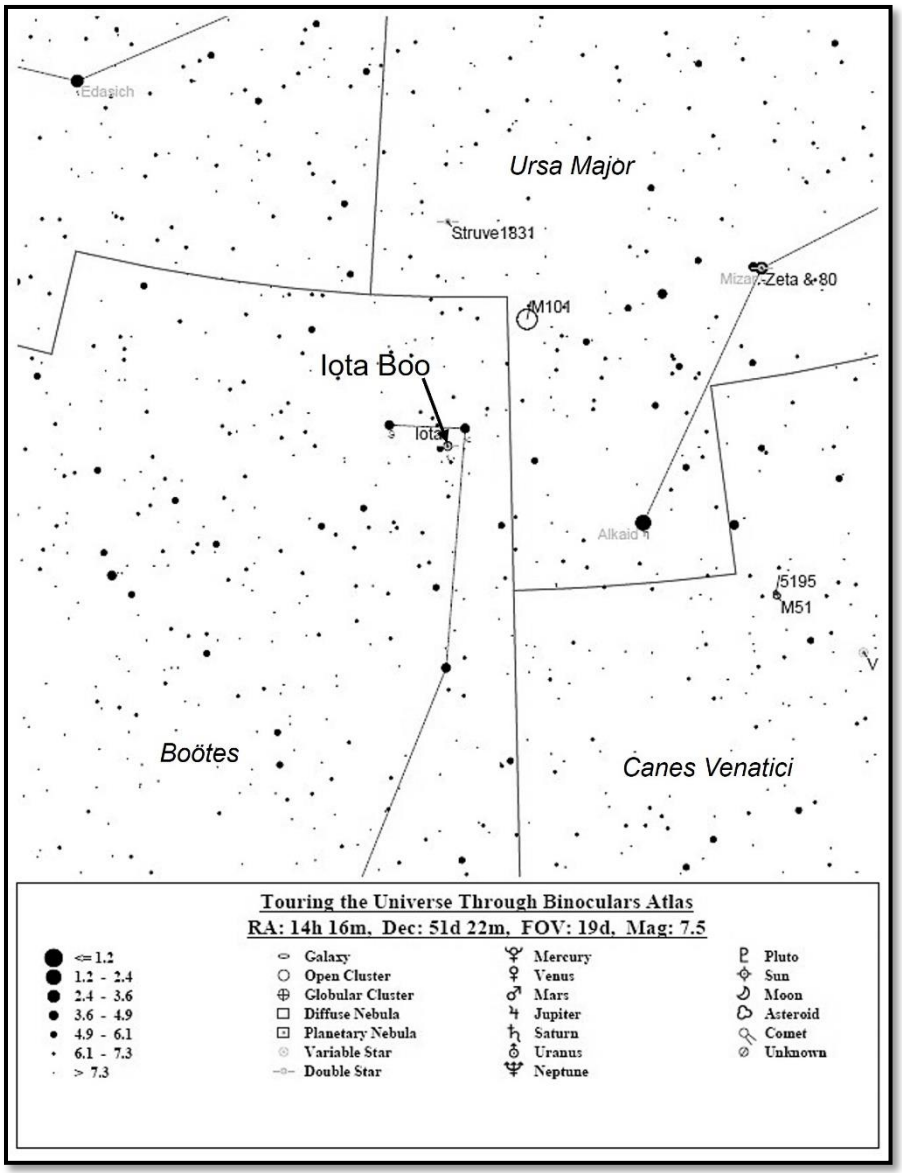
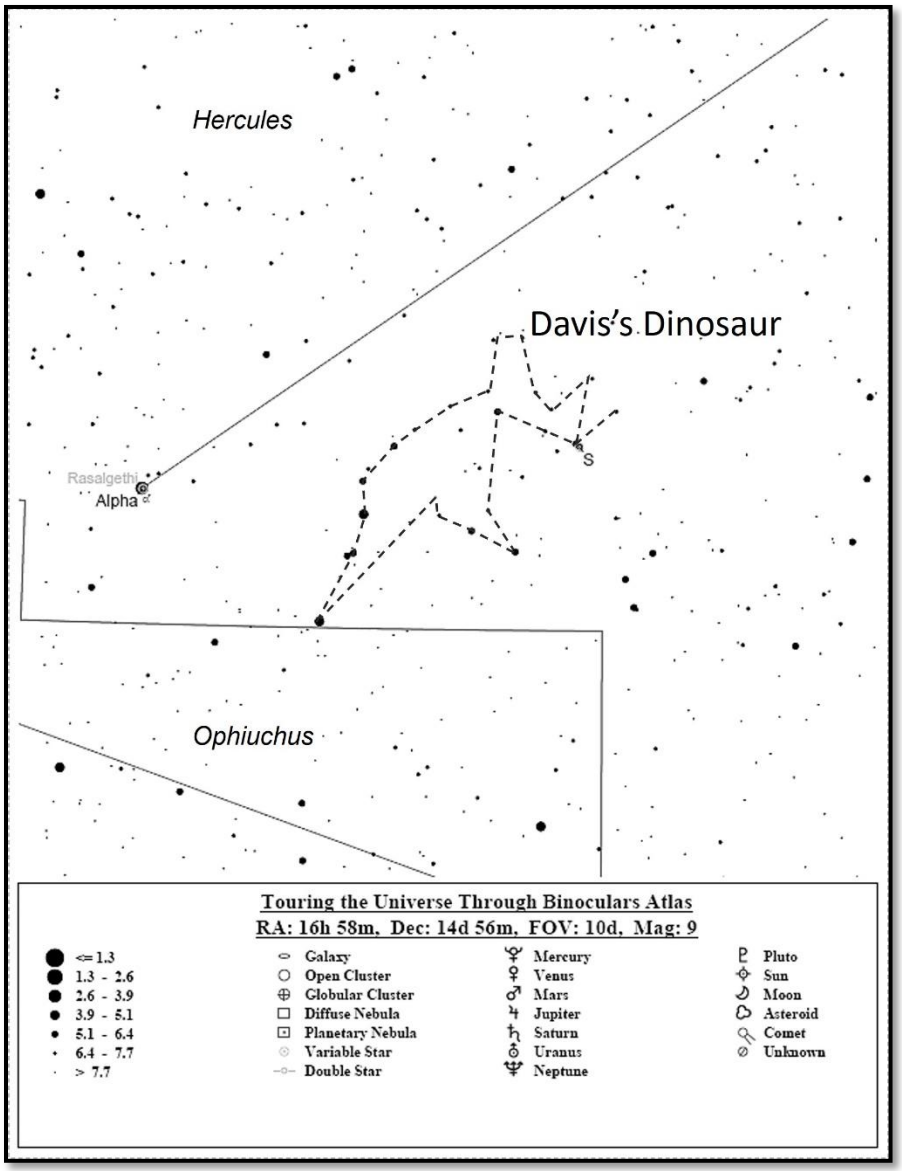


Chart 1. Iota (ι) Boötis



Swing 5°, or about a binocular field, northeast of Alkaid (Eta [η] Ursae Majoris) at the end of the dipper's handle, to a triangle of stars formed by Kappa (κ), Iota (ι) and Theta (θ) Boötis. **Iota Boötis**, the southernmost of the three, pairs a 5th-magnitude spectral-type A white main sequence star with an 8th-magnitude type K orange companion lying 38" arc-seconds to the northeast. That's tight, but still resolvable through steadily held 7x binoculars. Higher magnifications will have little trouble splitting the pair.

Chart 2. Davis's Dinosaur



Ophiuchus may be known as the Serpent-Bearer, but to the late, great observer and Stellafane regular John Davis, he also had a dinosaur on his shoulder. Technically, **Davis's Dinosaur** is within the boundary of Hercules, with the tip of its tail marked by 60 Herculis, just west of Rasalgethi (Alpha [α] Herculis). Its body then curves northwestward along a trail of 6th- and 7th-magnitude stars to its square head and pointy nose. The long-period variable star S Herculis marks its jaw, while the dinosaur's chest and underbelly are completed by additional 6th- to 8th-magnitude stars.

Here's John's original sketch of his dinosaur.

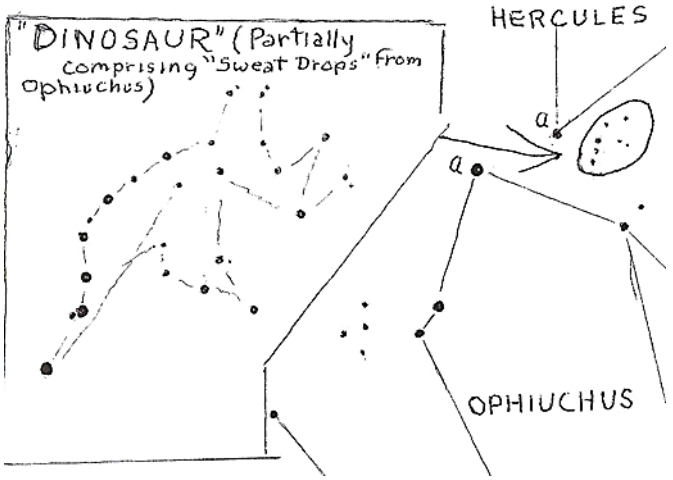
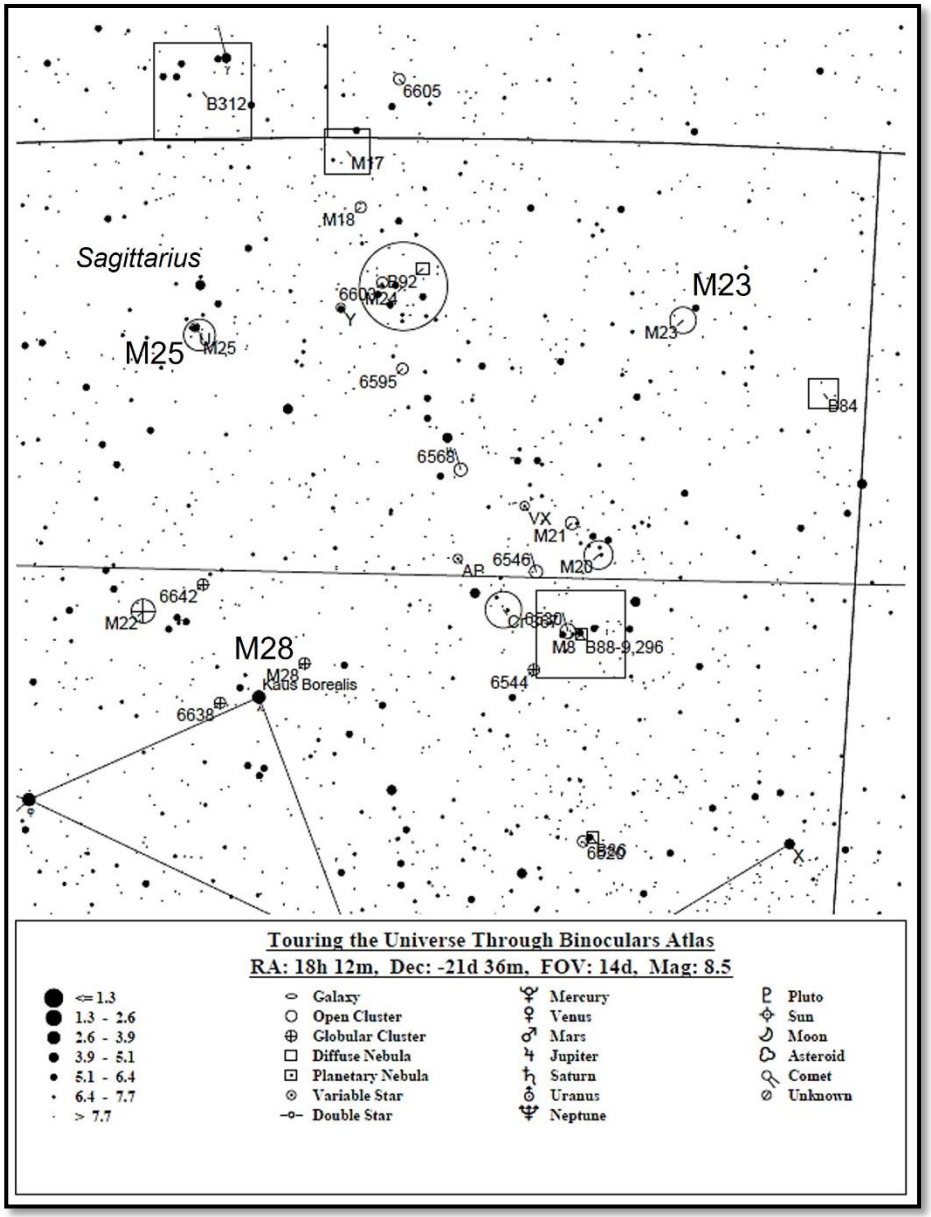


Chart 3. M23, M25, and M28



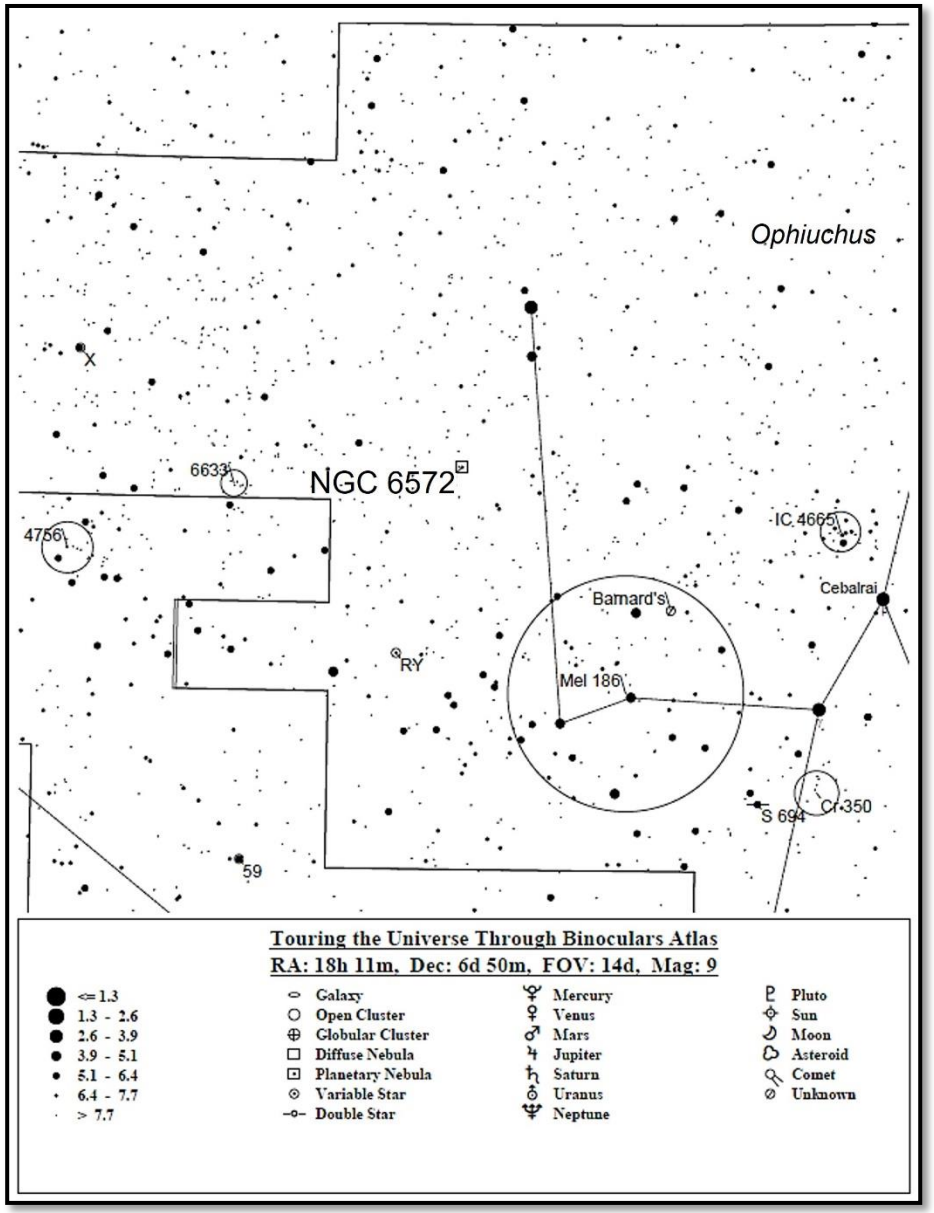
The Sagittarius Star Cloud, M24, is a spectacle to behold through all binoculars. But often, people miss two open clusters that stand to either side.

M23, found to the west, or right of M24, is packed with about 150 stars all compressed into an area that appears as large as the Full Moon. Most binoculars show a few points just breaking through the combined glow created by the remaining cluster suns that are too faint to be resolved individually.

The second star cluster here lies an equal distance to the east, or left, of M24. Through binoculars, **M25** should reveal four or five individual stars poking through a dim haze. One of those stars is a golden Cepheid variable star known as U Sagittarii. It's fun to watch U Sagittarii do its thing through binoculars as it fluctuates between 6th and 7th magnitude every 6.74 days. Look for it to the east-northeast of the cluster's center.

Just 1° to the northwest of Kaus Borealis [Lambda (λ) Sagittarii] at the top of the Teapot's lid, we find the small, densely packed globular cluster **M28**. Although not as eye-catching as some other nearby globulars, M28 is still worth a glimpse. Through my 10x50s, M28 reveals itself as a fuzzy "star." Even through my 25x100s, it still looks like a nebulous puff of unresolved stardust. That's also the impression it left with Charles Messier when he discovered it on July 27, 1764. He recorded a "nebula containing no star... round, seen with difficulty in 3½-foot [focal length] telescope." The true nature of M28 went unrecognized until William Herschel saw it as a "star cloud" through his much larger instruments.

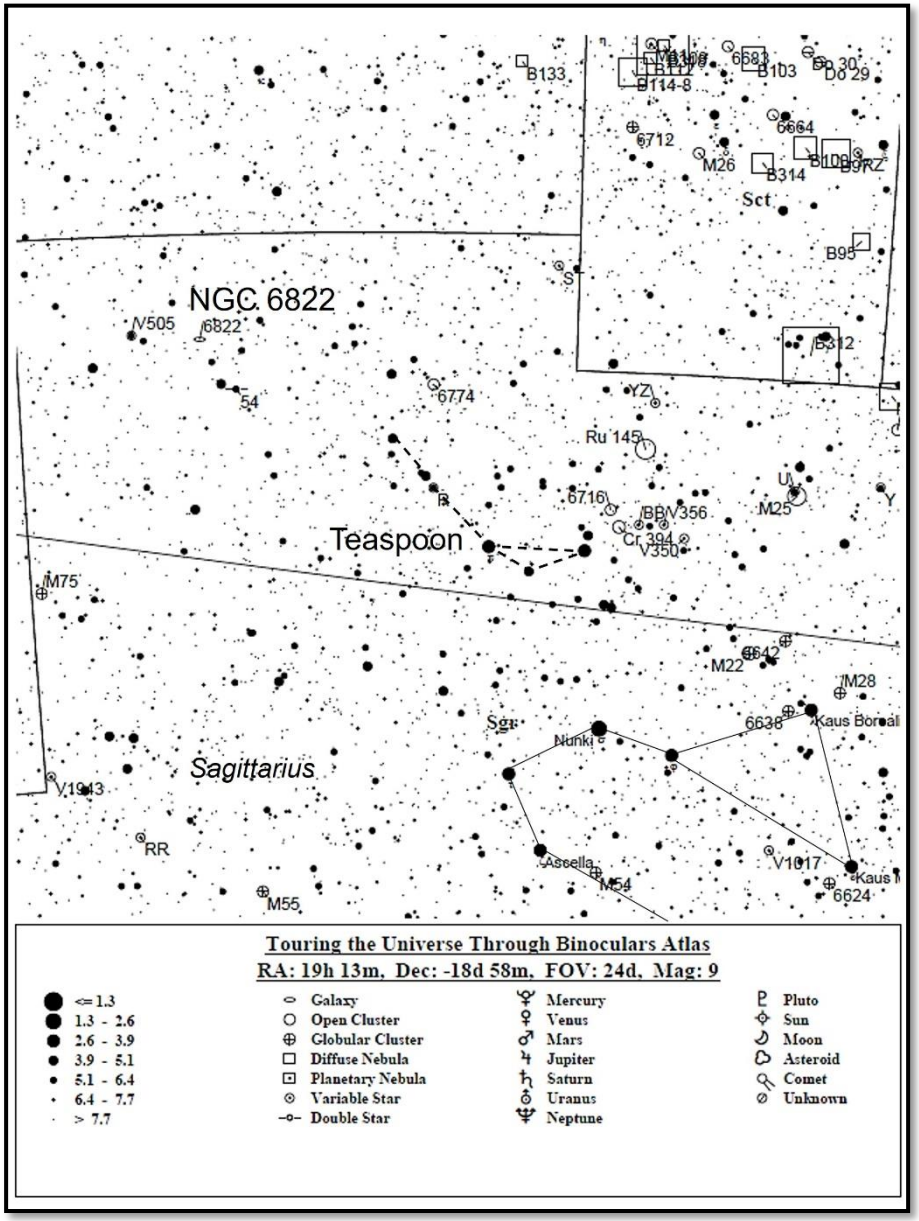
Chart 4. NGC 6572



Although planetary nebula **NGC 6572** appears perfectly stellar through all binoculars, even in my 25x100s, it's surprisingly easy to ferret out thanks to its color. Some describe it as blue (hence the nickname "Blue Racquetball"), but to my eyes it's a striking green. Because of this, I prefer the nickname given to it by Michael Bakich from Astronomy magazine, the "Emerald Nebula."

To find this jewel, begin at Cebalrai (Beta [β] Ophiuchi). Slowly move about 7½°, or about a field of view, to the east, then 2½° north. NGC 6572 shines at 9th magnitude. Don't confuse the 9th-magnitude field star that lies just 3.5' to its east for the nebula. The star is not green. But it does create a nice "double star" effect.

Chart 5. Teaspoon and NGC 6822



Sagittarius's distinctive Teapot asterism is a favorite sight as it crawls along Stellafane's southern sky. But have you ever seen the matching **Teaspoon** to its east?

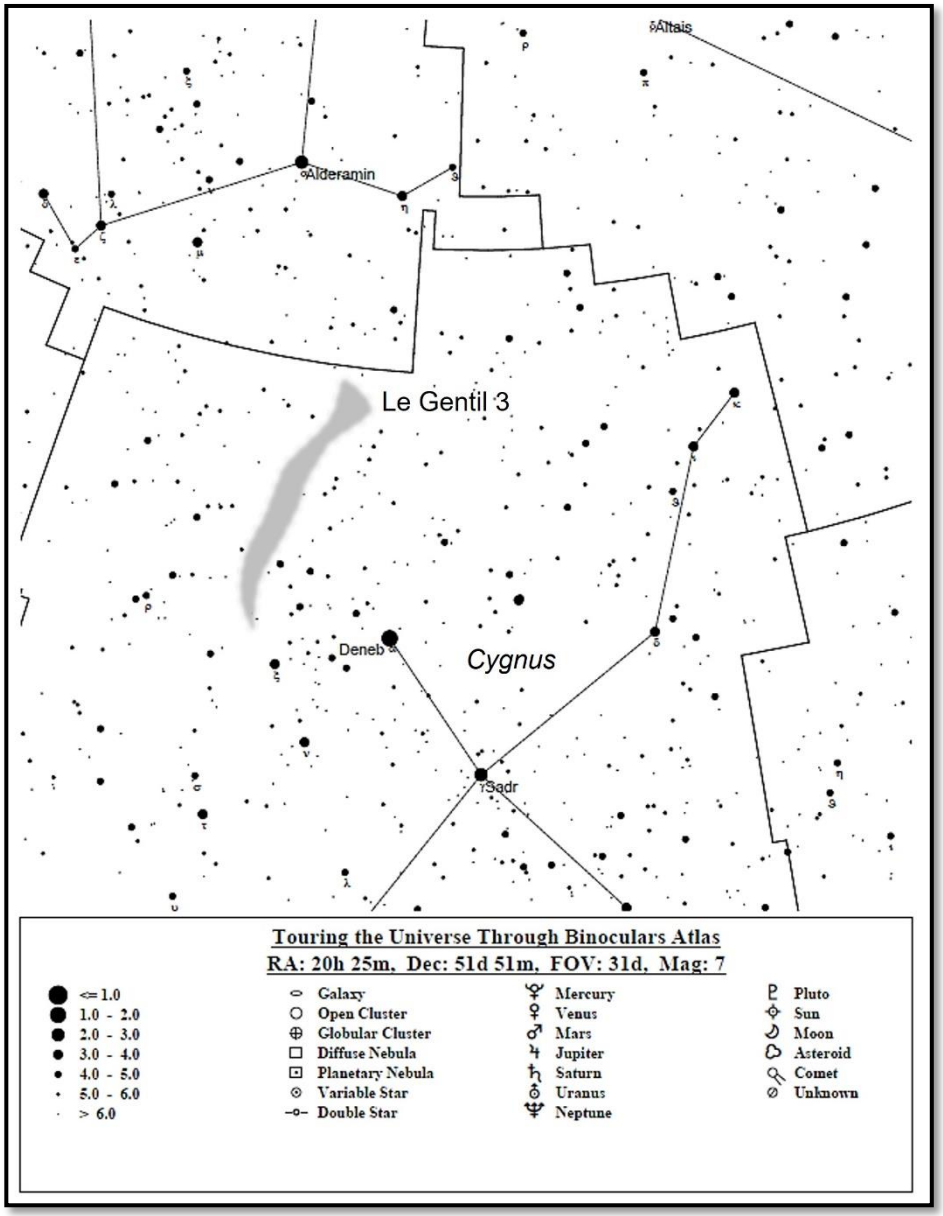
The Teaspoon asterism is a fun sight with even the smallest pocket binoculars. It's drawn from the stars Nu (ν), Rho-1 (ρ-1), 43, Pi (π), Omega (ω), and Xi-1 (ξ-1) and Xi-2 (ξ-2) Sagittarii. All are found to the northeast of the Teapot's curved handle.

The Teaspoon can also guide us toward our next target. By scanning 5° due east of Nu Sagittarii at the northern end of the Teaspoon's bent handle, you'll come to a small upside-down kite-shaped pattern of five stars.

Notice how the three stars marking the top of the kite curve toward **NGC 6822**, a dwarf barred irregular galaxy that is also known as Barnard's Galaxy. Even though this guy is a member of the Milky Way's Local Group of galaxies, it requires dark skies and a steady hand to be seen with binoculars. And even then, it's a difficult catch. I've made it out with my 16x70s, but have never nabbed it in anything smaller. But it's always fun to try, right?

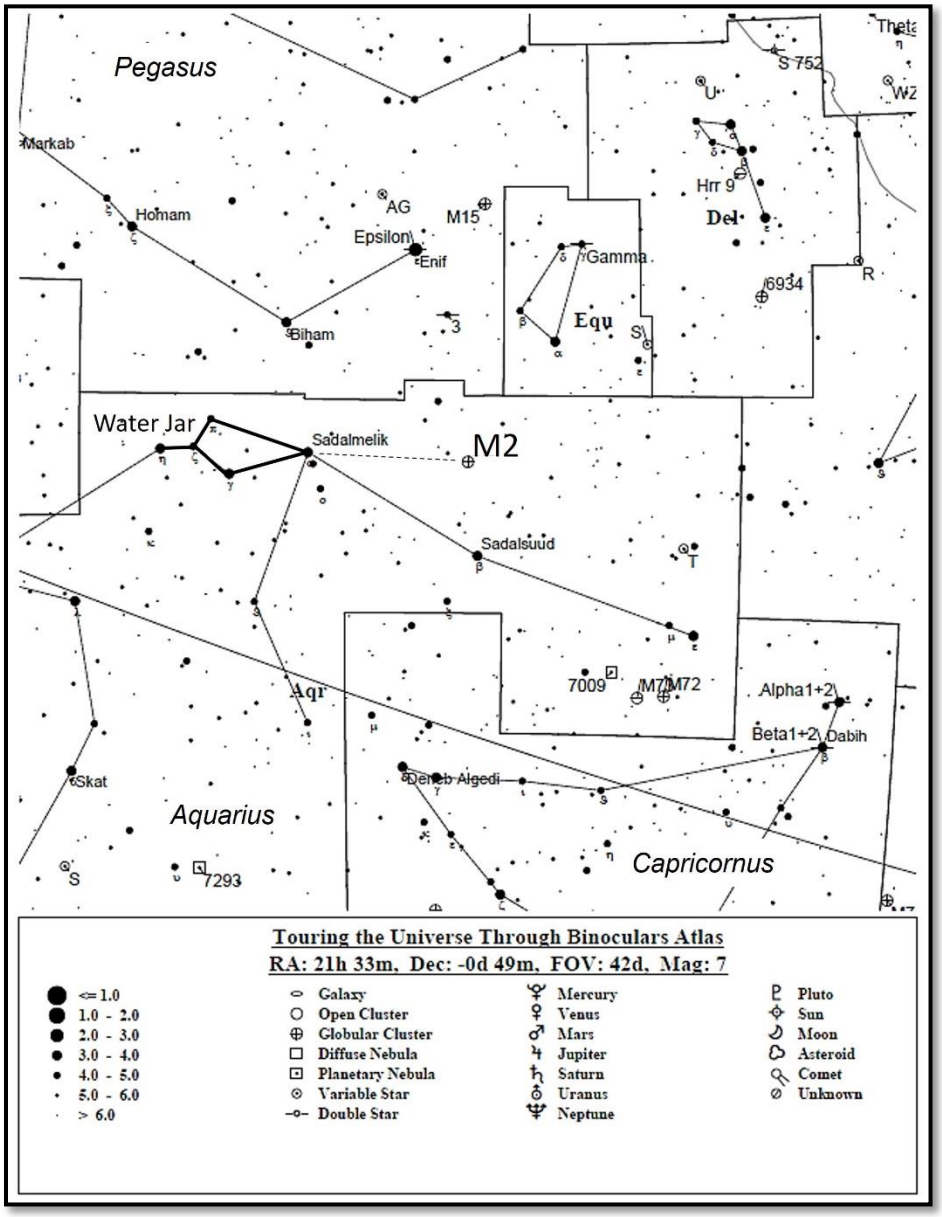
Barnard's Galaxy is easily hidden by any haze because of its southerly declination. Its light is further dimmed by intervening clouds of cosmic dust. If you can't find it at first, you can take heart in knowing that legendary father-and-son observers William and John Herschel never saw it either!

Chart 6. Le Gentil 3



French astronomer Guillaume Le Gentil (1725 – 1792) is credited with the discovery of this dark nebula, although oddly it was not included in Edward Barnard's original dark nebula catalog published in 1919 or the expanded version of 1927. Yet **Le Gentil 3** can be seen by eye alone to the north of Deneb. With 10x50 binoculars, the tapered, tornado-like profile is unmistakable. That led Canadian amateur Alan Whitman to nickname it the **Funnel Cloud Nebula**.

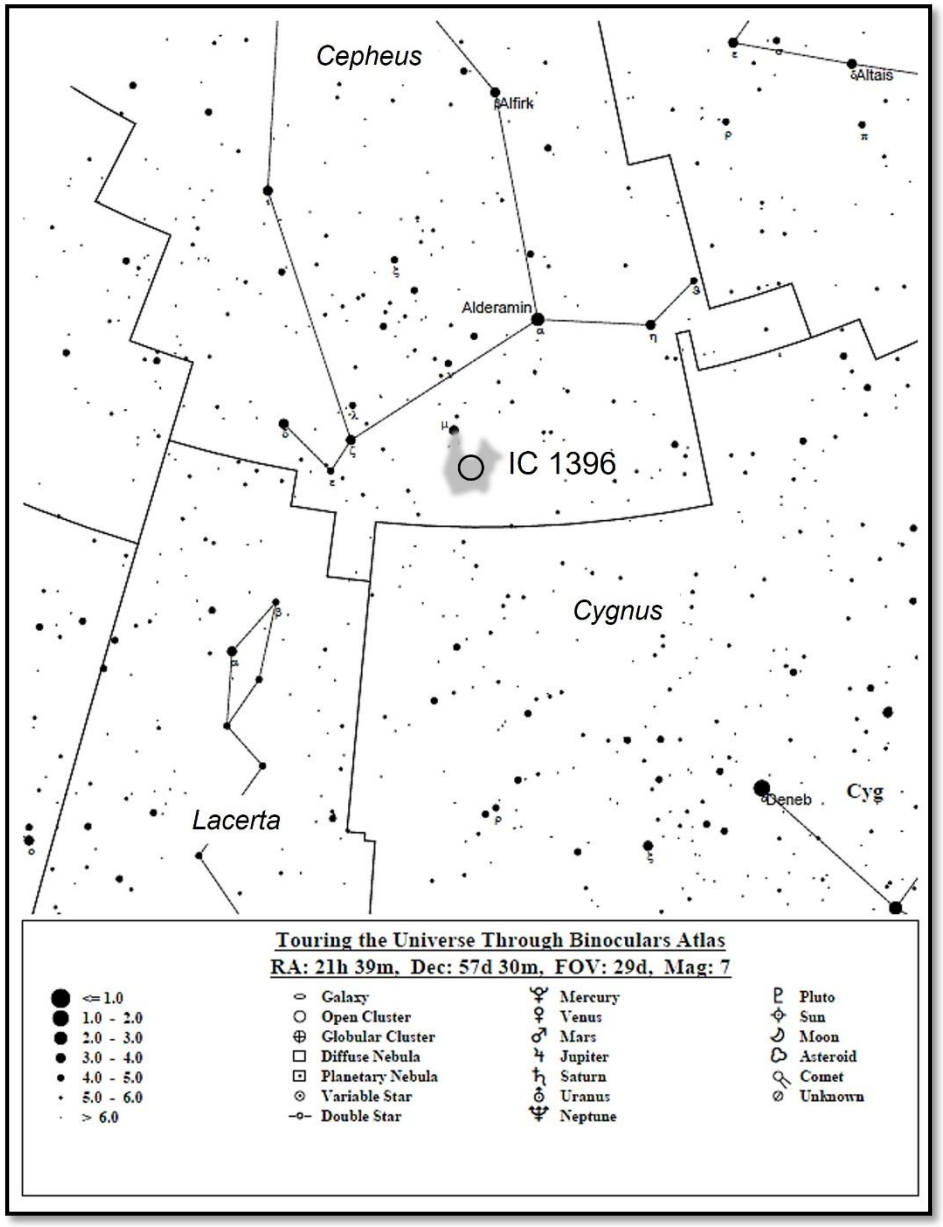
Chart 7. M2



Although the entire form of the constellation Aquarius is tough to trace, the distinctive Y-shaped asterism of 4th- and 5th-magnitude stars known as Aquarius's Water Jar is easy to spot. All fit nicely into most binocular fields. Add in the star Sadalmelik (Alpha [α] Aquarii) to their west and you can form a convincing arrowhead, shown on the map at left.

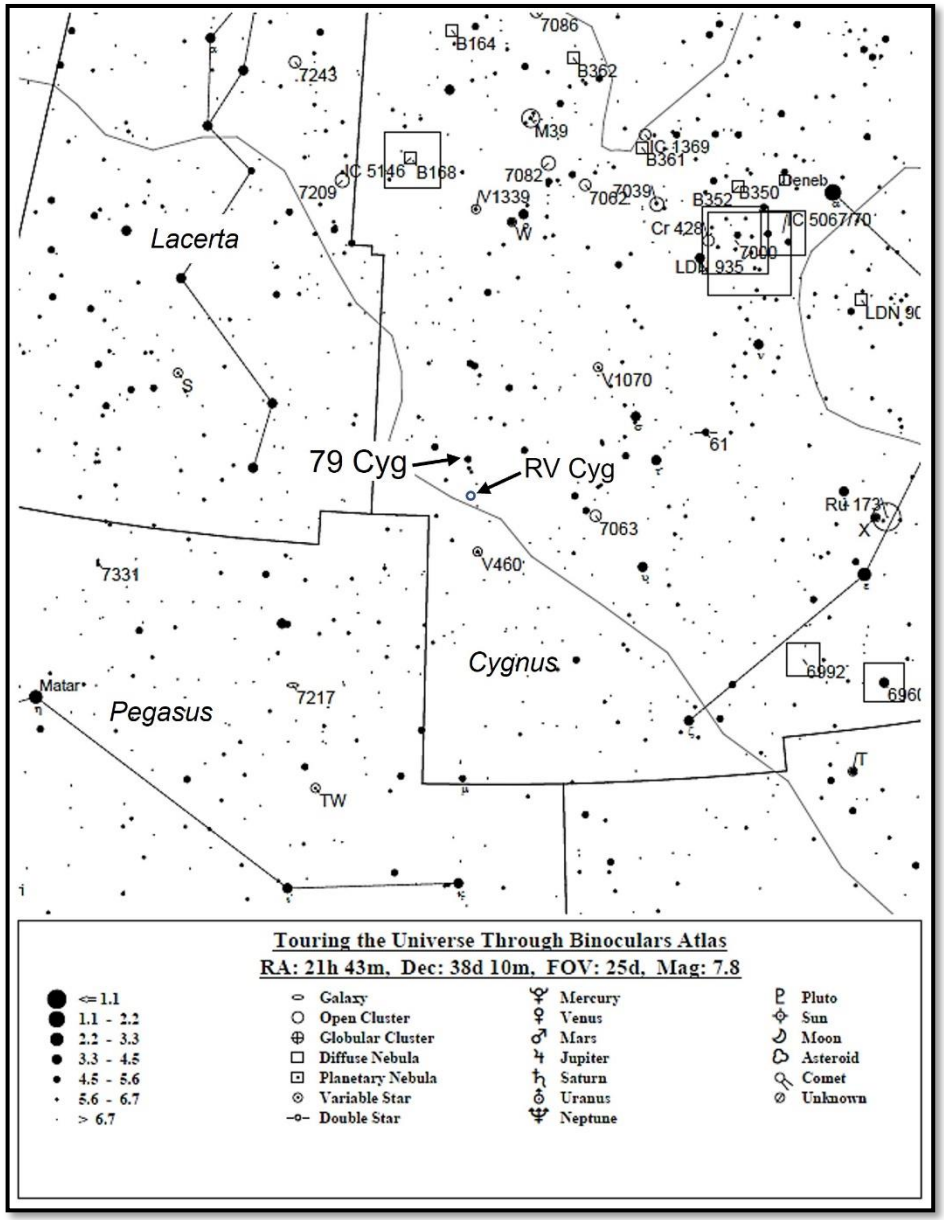
By following the arrowhead's aim to the west about a binocular field, you'll come to a small smudge of light. That's the globular cluster **M2**, a giant megalopolis of perhaps 150,000 stars. Binoculars typically don't have enough oomph to resolve M2 into anything more than a tiny celestial ball of cotton, although my 16x70s will show it as slightly oblate. Most globulars appear almost perfectly round.

Chart 8. IC 1396



Okay, this next one is *tough*! **IC 1396** is a huge region of emission nebulosity measuring nearly 3° in diameter. Due to its wide expanse, few amateur telescopes have a broad enough field to take it all in. Yet, thanks to their wider views, binoculars can reveal this delicate cloud. Sightings of IC 1396 have been reported through 7x50s equipped with contrast-enhancing nebula filters, while in 15x binoculars the cloud appears as a broken, irregular wreath of grayish light embedded with several centrally located stars. Without the aid of nebula filters, however, IC 1396 will likely remain unseen.

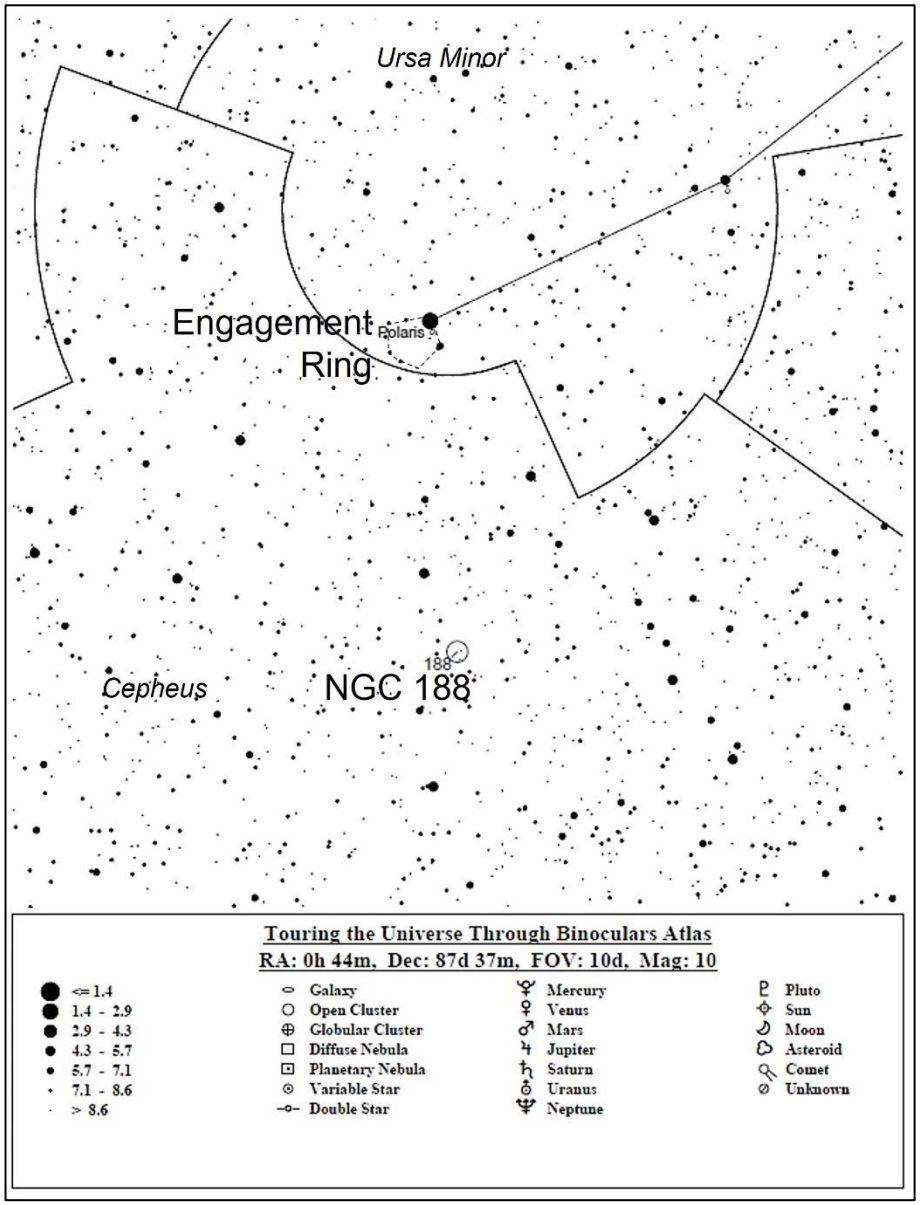
Chart 9. 79 Cygni



For double star fans, try your luck with **79 Cygni**, about a binocular field east of 61 Cyg. The 6th-magnitude primary is separated from the 7th-magnitude companion by 150 arcseconds. That makes them easy targets for 6x and 7x binoculars. Both stars appear white at those magnifications, but some viewing through larger binoculars describe the secondary as lemon yellow. Try defocusing your binoculars *slightly* to see the subtle color.

Speaking of color, the 8th-magnitude carbon star **RV Cygni** lies nearby. 50-mm and larger binoculars may be needed to detect its ruddy color.

Chart 10. NGC 188 and Polaris Engagement Ring

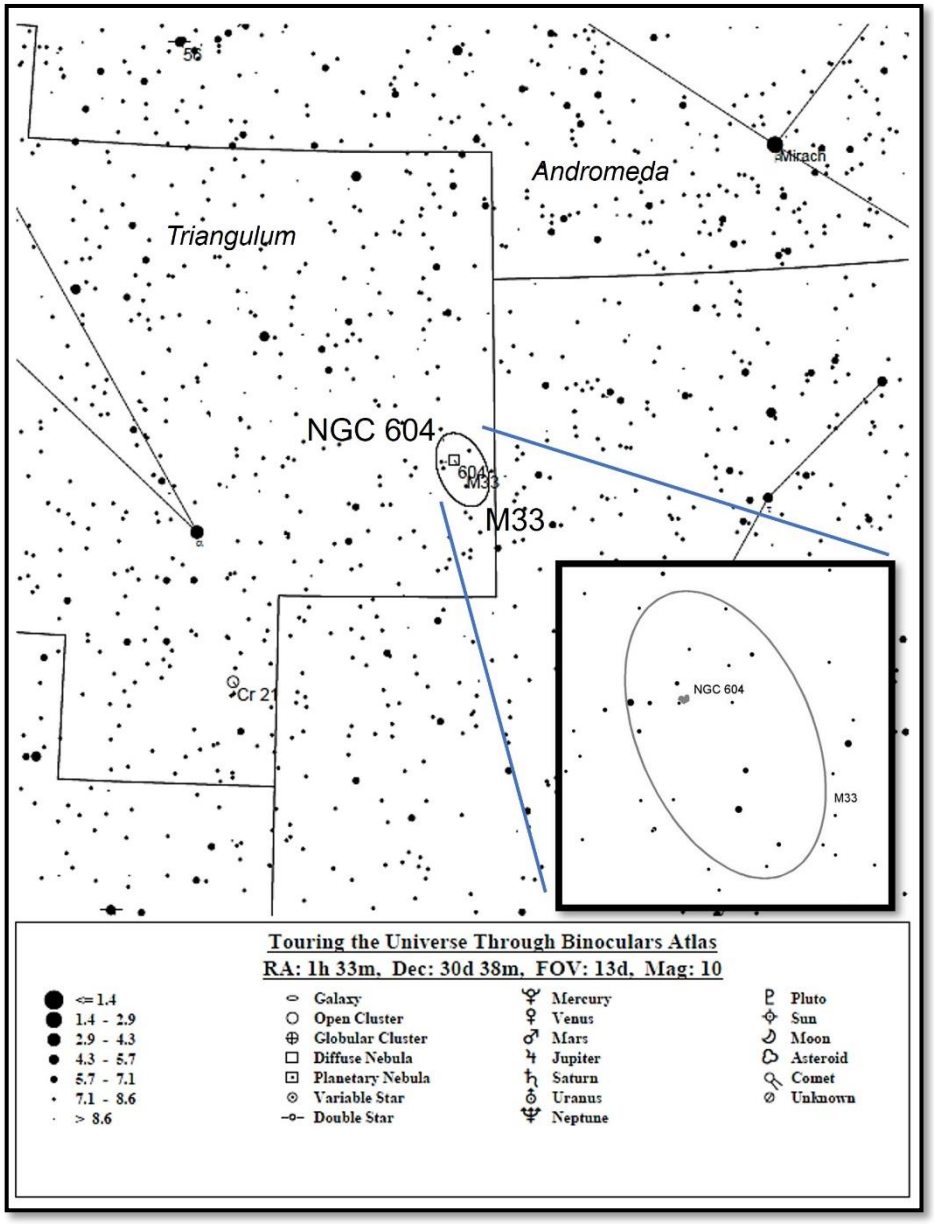


If you aim your binoculars at Polaris, you will notice that it is the brightest member of a circlet of stars about half a degree across. At 2nd magnitude, Polaris really stands out as the others shine between 7th and 8th magnitudes. The late Robert Burnham, Jr, was the first to notice this asterism. In his classic Burnham's Celestial Handbook, he describes it as the **Engagement Ring of Polaris**, with "Polaris itself sparkling as the celestial solitaire of the ring."

Ready for another challenge? While most open star clusters lie along the plane of our Milky Way, northernmost Cepheus holds an out-of-place cluster that is *barely* visible through my 16x70 binoculars on the clearest, darkest nights. I imagine that John Herschel was quite surprised to discover this rogue object on November 3, 1831. He described it as "very large, pretty rich..." Now cataloged as **NGC 188**, this lonely cluster resides just over 4° from Polaris and only 1° south-southwest from the 4th-magnitude star SAO 181.

Some 130 stars ranging from 10th to 17th magnitude call NGC 188 home. Together, they blend into an 8th-magnitude glow spanning about ¼°. The cluster's low surface brightness, however, makes it a difficult challenge in binoculars and smaller telescopes alike.

Chart 11. M33 and NGC 604



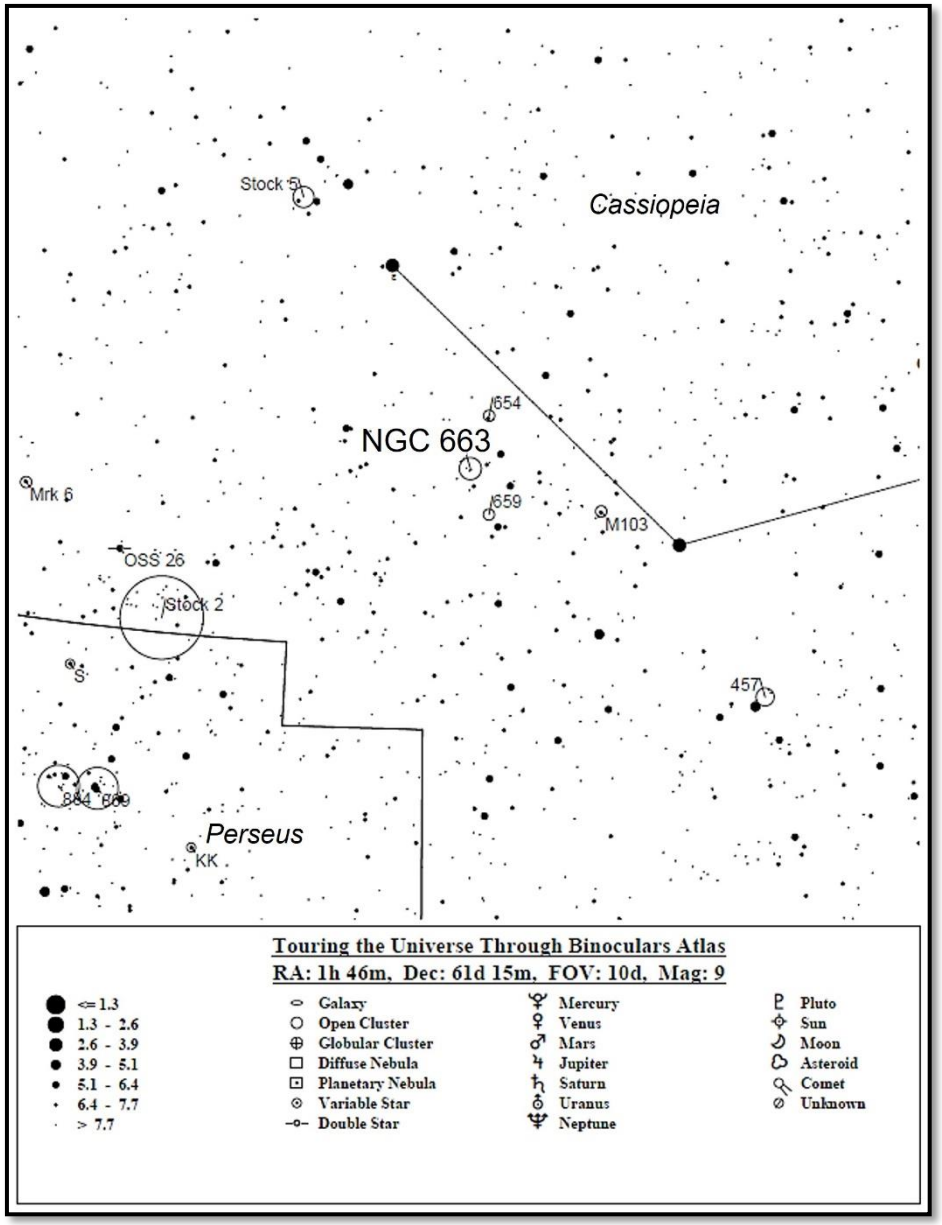
M33 is one of the "Big Three" in our Local Group of galaxies (the others being M31 and the Milky Way). But while M31 is perhaps twice as massive as our galaxy, M33 is somewhat smaller. M33 is tilted almost face-on from our perspective, one of the reasons why its surface brightness is so low, which makes it difficult to find.

To spot it, aim toward the star Alpha (α) Trianguli at Triangulum's apex. Scan about half a field toward Alpheratz in Andromeda. You should see a faint field star somewhere near the center, with Alpha Tri now in the eastern half of the field. Move another half a field toward Alpheratz and look for a large, very faint glow. That will be M33.

M33 is often easier to find in steadily held binoculars than through telescopes, since their wider fields of view are better at distinguishing the large galactic disk from the surroundings. Their wide fields also make it possible to fit Alpha Trianguli, M33, and that intermediate 6th-magnitude star all into the same view.

Once you spot M33 itself, use the map insert to find an object that is actually inside the galaxy. Binoculars 70mm in aperture and larger should reveal a small blur of light just to the northeast of the galactic core. Messier never saw this second object; instead, we know it by its entry number in the New General Catalog, **NGC 604**. NGC 604 is a massive emission nebula, like the Orion Nebula in our winter sky.

Chart 12. NGC 663

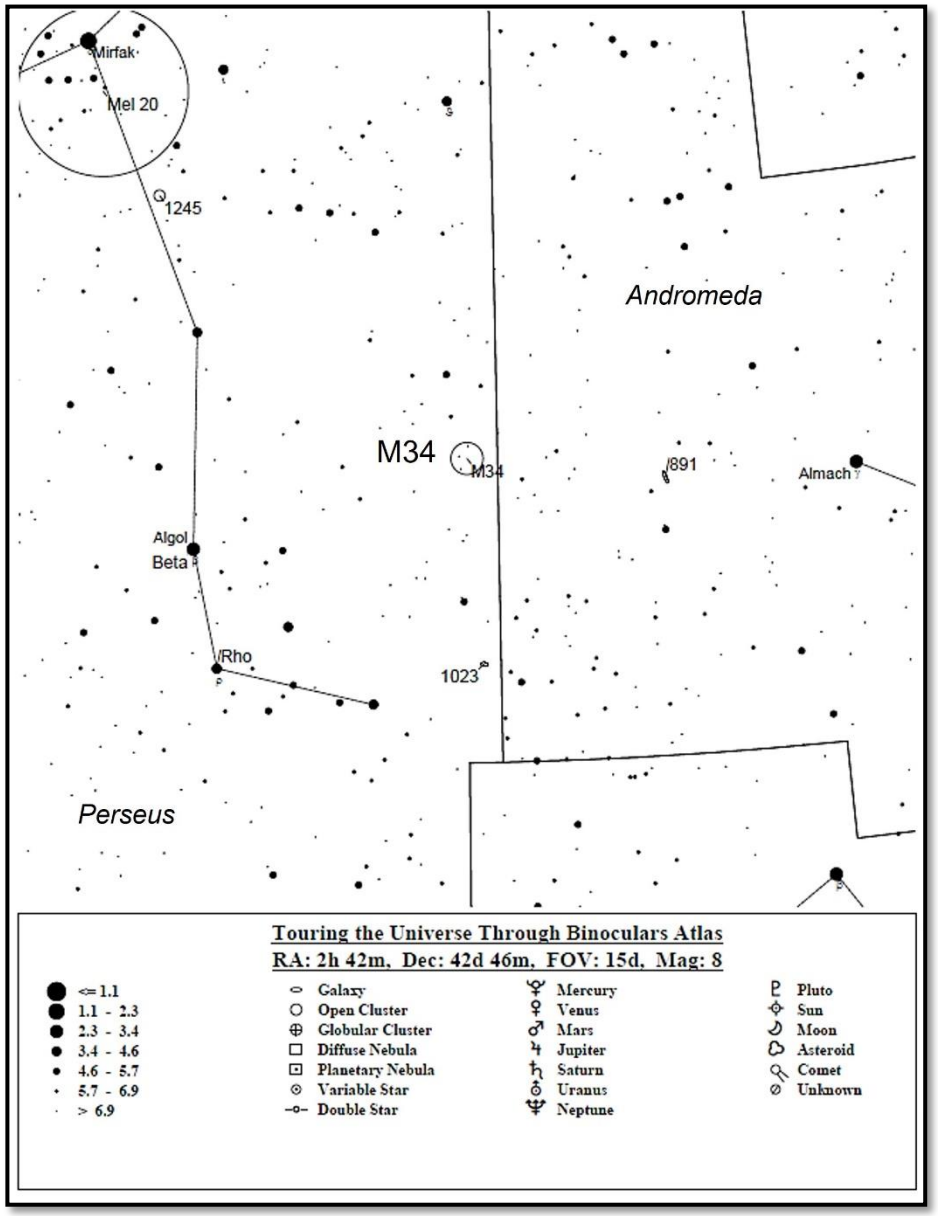


NGC 663 is a striking assembly of about 80 faint stars. Those stars shine collectively at 7th magnitude, but remain unresolvable individually through 7x to 10x binoculars. The brightest just peak out from the glow in my 16x70s. Even larger binoculars reveal that the stars appear bunched into two asymmetric clumps.

To find NGC 663, aim halfway between Ruchbah (Delta [δ] Cas) and Epsilon (ε) Cas, and then glance just to the east for a pair of 6th-magnitude stars. NGC 663 is to their east.

Once you pick off NGC 663, see if you can also find two other open clusters, NGC 659 to its south and NGC 654 to its north. And there is always M103, nestled 1° northeast of Delta (δ) Cas. Of these clusters, which stands out the best? I have my opinion. What's yours?

Chart 13. M34

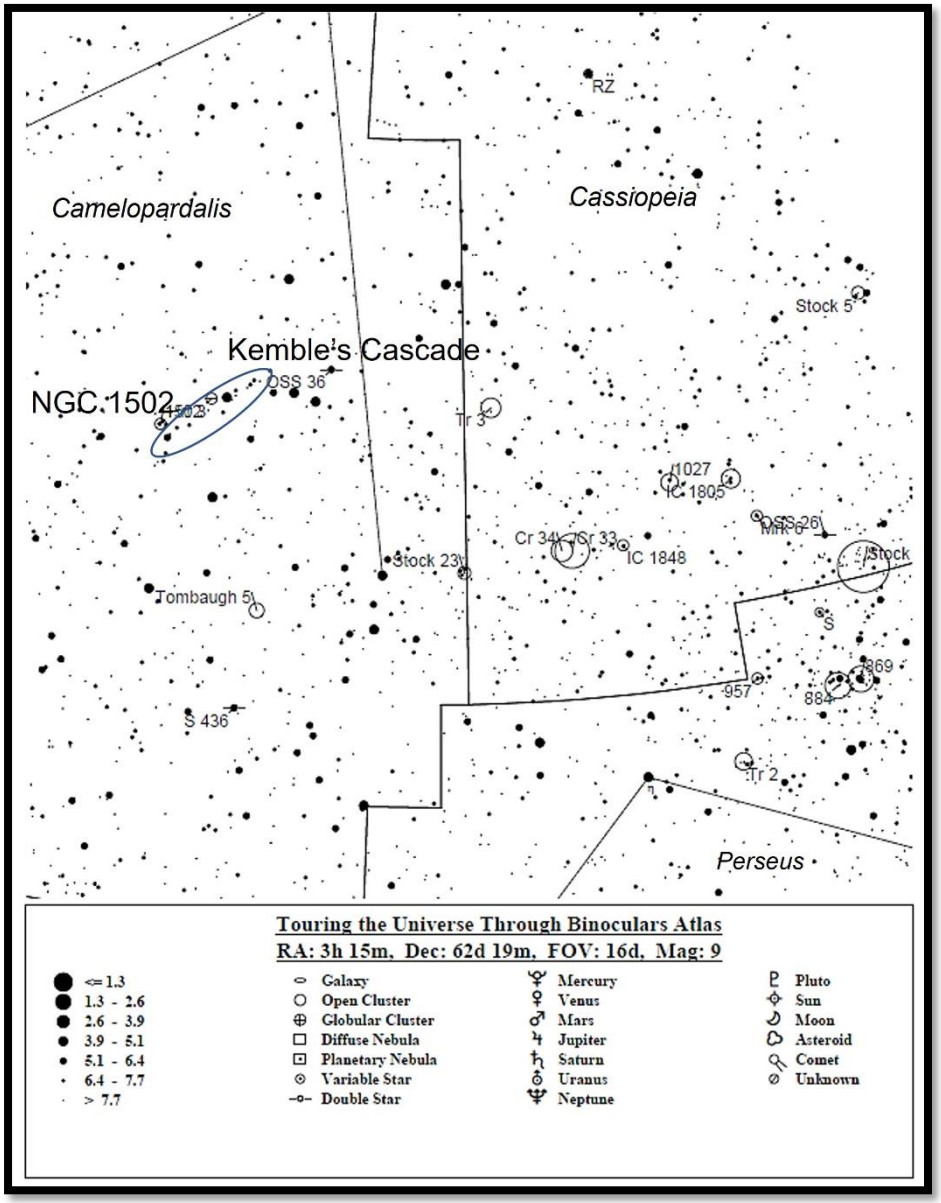


M34 is found roughly midway between Algol (Beta [β] Persei) and Almach (Gamma [γ] Andromedae). Algol and M34 are separated by 5°, so depending on the span of your binocular's field, both may just squeeze into the same view.

Through most binoculars, M34 looks like a hazy patch of light about as large as the Full Moon. Look for the brightest of its hundred or so stars twinkling in the soft glow of fainter, unresolved suns. If distance estimates of 1,400 light years to M34 are correct, then the cluster spans about 14 light years edge to edge.

Interestingly, M34's discovery predates Messier's first encounter by more than a century. Giovanni Batista Hodierna, an Italian astronomer in the court of the Duke of Montechiaro, was the first to spot it, probably before 1654. Messier independently rediscovered it in 1764.

Chart 14. NGC 1502 and Kemble's Cascade



Draw an imaginary line across the Cassiopeia W, from Caph (Beta [β]) to Epsilon [ε] Cas and extend it the same distance east into the emptiness of Camelopardalis. Raise your binoculars and look for a surprisingly straight stream of faint stars spanning 2.5° flowing from northwest to southeast.

This unusual asterism was first noticed in 1980 by the late Canadian amateur astronomer and Franciscan monk Father Lucian Kemble while he was scanning Camelopardalis with 7x35 binoculars. Curious about this alignment, he contacted Walter Scott Houston to see if he was familiar with it. Houston was the preeminent deep-sky authority during the latter half of the 20th century, yet he was unaware of Kemble's find. Houston alerted readers of this unusual sight, christening it **Kemble's Cascade**.

Fourteen stars make up Kemble's Cascade. Most are between 7th and 9th magnitude, save for a 5th-magnitude bluish sun midway along the stream. I imagine that as a rock protruding out of a torrent of roaring rapids. Despite appearances, the stars of Kemble's Cascade have no physical relation to each other in space. They are simply a chance line-of-sight alignment.

As you ride the rapids along Kemble's Cascade flowing southwestward, you will see that they end near a small, hazy patch. Father Kemble compared the view to the cascades ending with a waterfall, the misty glow being a cloud of water vapor wafting above a swirling pool at the base of the falls. The glow we see is the open star cluster **NGC 1502**.

NGC 1502 is made up of 45 stars, most of which are fainter than 10th magnitudes. Despite their individual faintness, the stars combine their resources to create a 6th-magnitude object for us to enjoy. Look carefully and you might notice two or three faint points shining out from the cluster's glow.