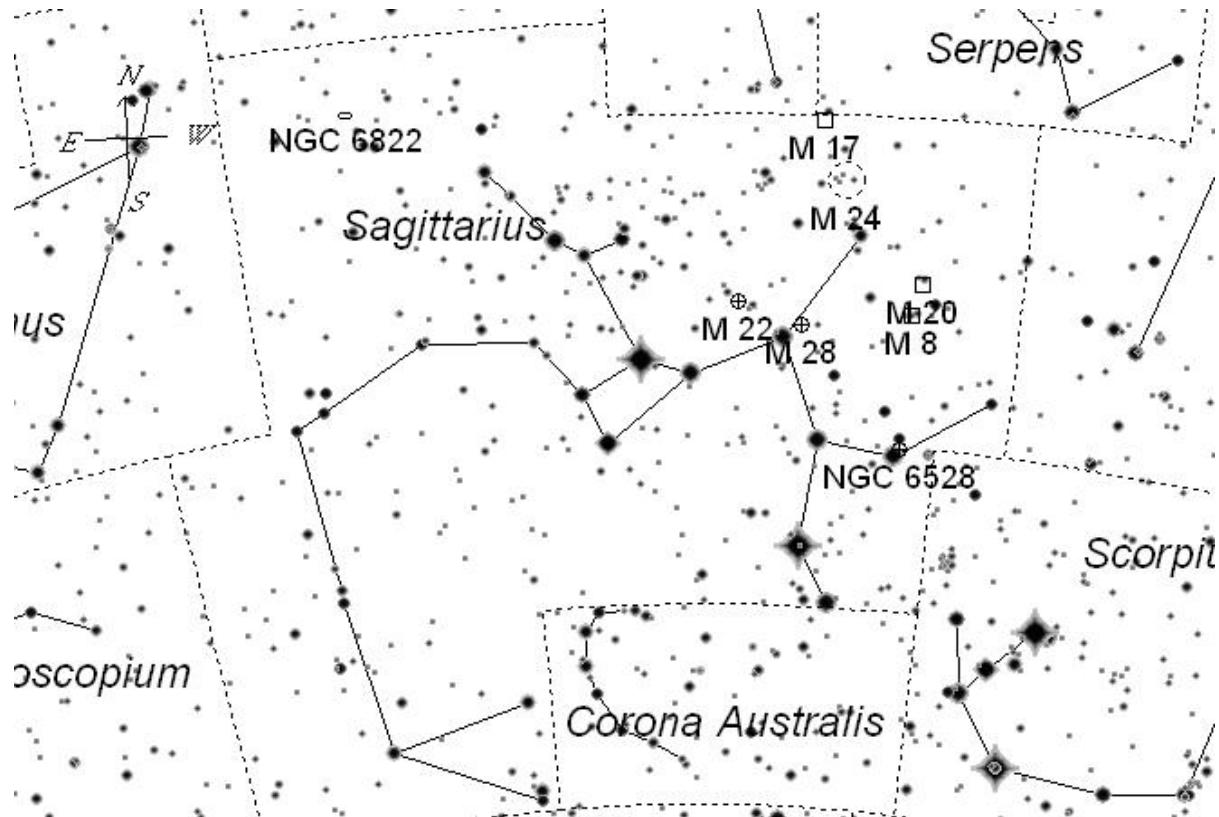


Small Wonders: Sagittarius

A Monthly Beginners Guide to the Night Sky

by Tom Trusock



Widefield Chart

Target List	Name	Type	Size	Mag	RA	DEC
	lambda	Star		2.8	18h 28m 15.8s	-25° 25' 15"
	M 8	Bright Nebula	45.0'x30.0'	5.0	18h 04m 05.4s	-24° 23' 06"
	M 17	Bright Nebula	20.0'x15.0'	6.0	18h 21m 04.4s	-16° 10' 57"
	M 20	Bright Nebula	20.0'x20.0'	6.3	18h 02m 35.2s	-23° 02' 06"
	M 22	Globular Cluster	32.0'	5.2	18h 36m 41.6s	-23° 54' 02"
	M 24	Star Cloud	95.0'x35.0'	3.1	18h 16m 58.7s	-18° 39' 59"
	M 28	Globular Cluster	13.8'	6.9	18h 24m 50.4s	-24° 52' 07"
Challenge Objects	Name	Type	Size	Mag	RA	DEC
	NGC 6522	Globular Cluster	9.4'	9.9	18h 03m 52.3s	-30° 02' 07"
	NGC 6528	Globular Cluster	5.0'	9.6	18h 05m 07.8s	-30° 03' 25"
	NGC 6822	Galaxy	15.4'x14.2'	8.7	19h 45m 12.9s	-14° 47' 46"

Centaurs or Teapots?



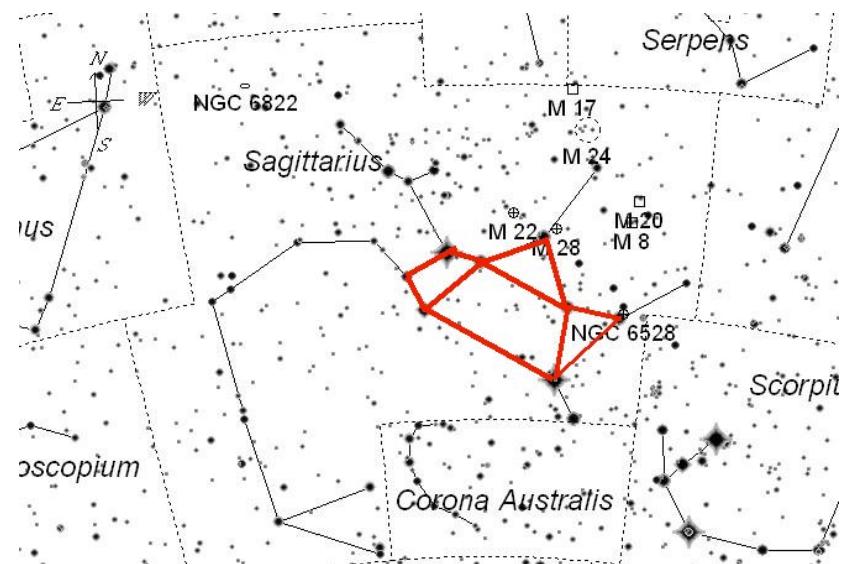
For some reason I've never really fathomed, Sagittarius has long been seen as a cosmic Centaur with a Bow. (In this case, I'm I find it somewhat reminiscent of *South Park's* Planetarium Episode - some of you out there may know what I'm talking about, the rest feel free to ignore me and continue on.)

Personally, I've always seen the major stars as a Teapot, with the Milky Way curling up and out of the spout - cosmic steam if you will. While I'm not alone in this, some notables -

including the venerable Sir Patrick Moore - apparently can't seem to visualize the Teapot.

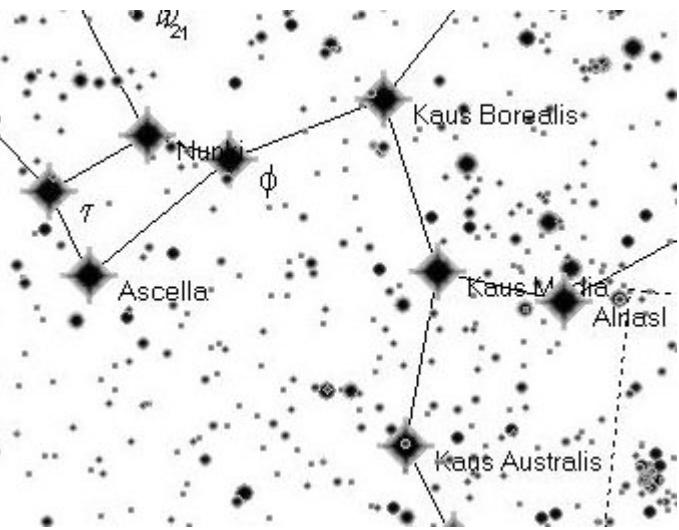
The western tradition behind visualizing Sagittarius as a Centaur is probably around 5000 years old - the Greeks themselves probably inherited this constellation from the Assyrians or Babylonians. I have this vision of ancient Greeks, looking up in the sky and saying: "A Centaur? Uhhh - sure - I think those Assyrians have been hitting the meade a little to heavy, but whatever..."

Either way you draw it - Teapot or Centaur - lodged in the summer Milky Way, this constellation contains an abundance bright deep sky delights. The only problem this month was narrowing down the list so the tour would be manageable!

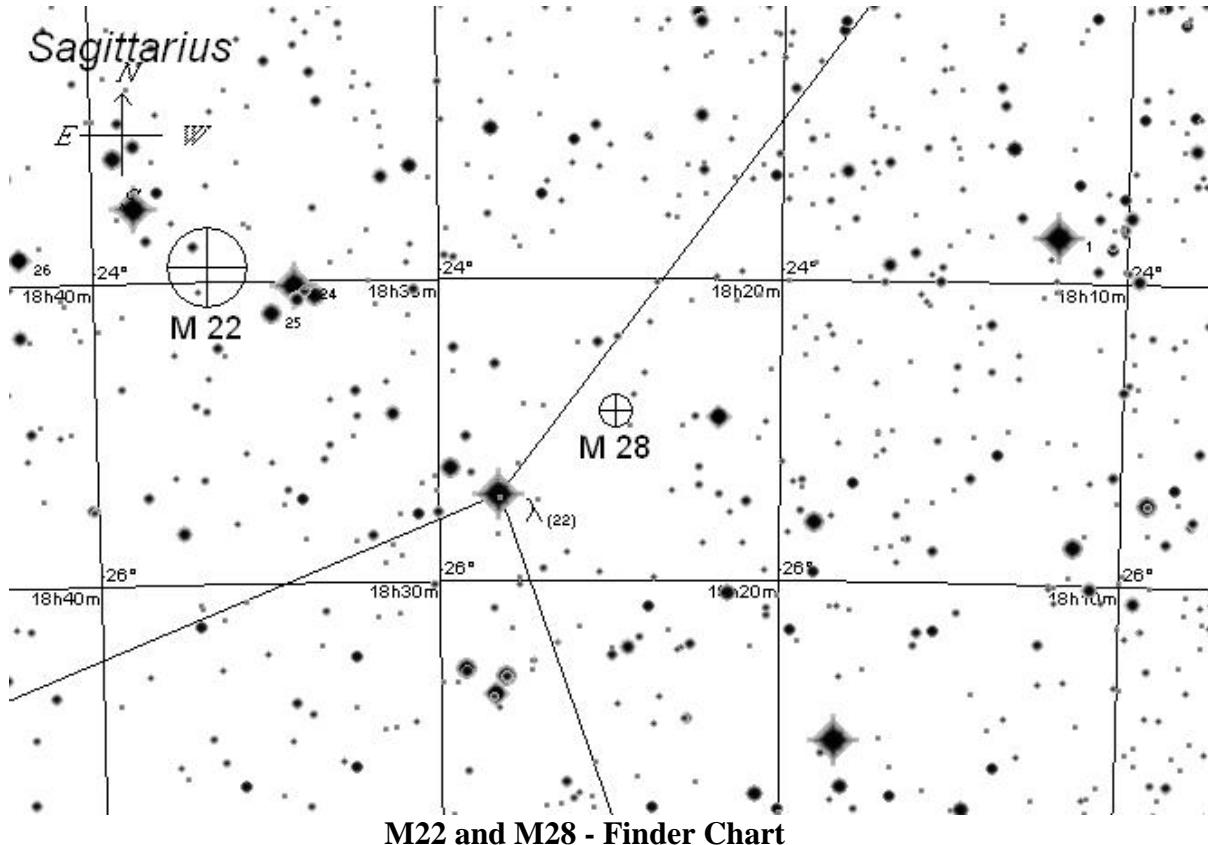


Nebulae, Globulars and Star Clouds - Oh my!

Nearly everything that I'll be covering is on top portion of the Teapot, so it pays to know where at least one star in the asterism resides. In particular, I'm thinking of is Kaus Borealis - also known as Lambda Sagittarii. If you reference the picture of the Centaur above, you can see Kaus Borealis is nearly at the northern tip of the Archers Bow, and in fact, Kaus is Arabic for Bow, while Borealis is Latin for North. Mark it's position and mark it well. This bright yellow, mag 2.8 star carries a spectral class of K2, and for those of us who don't see a stellar centaur here, Kaus Borealis resides at the tip of the teapot. It's a nice, distinctive starting point for finding either M28 or M22. When scanning the area with a small telescope or binoculars, Lambda clearly stands out...



M22 and M28 - Bright Summer Globulars





M22 is the definite showpiece in the area, located about 4 degrees north west of Kaus Borealis (shown as Lambda in the chart above). It's easily picked up from northern latitudes with only the smallest optical aid, and begins to show resolution even in very small scopes. In my 4", the edges clearly resolve under moderate power, and in 8" or larger, this globular is a spectacular sight.

According to SEDS this was probably the first globular discovered (as such), and its discovery is usually credited to the German Astronomer Abraham Ihle in 1665. Microlensing investigations with the Hubble

space telescope in 1999, suggest this globular may be home to a series of planets, slightly smaller than Saturn wandering throughout the globular.

If M22 was better placed in the northern sky, I wonder how well known it would be. I suspect that it would outpace that other summer showpiece M13. But then again, M13 has less competition as far as its neighbors are concerned.

M22's closest bright Deep Sky neighbor is M28, and I've found it to completely overshadow the poor fella. At around 3x the angular size of M28, M22 is definitely worth a stop on your tour this evening - no matter what size scope or binoculars you have.

From a dark site, you might want to see if you can pick up M22 without any optical aid at all - you might surprise yourself!

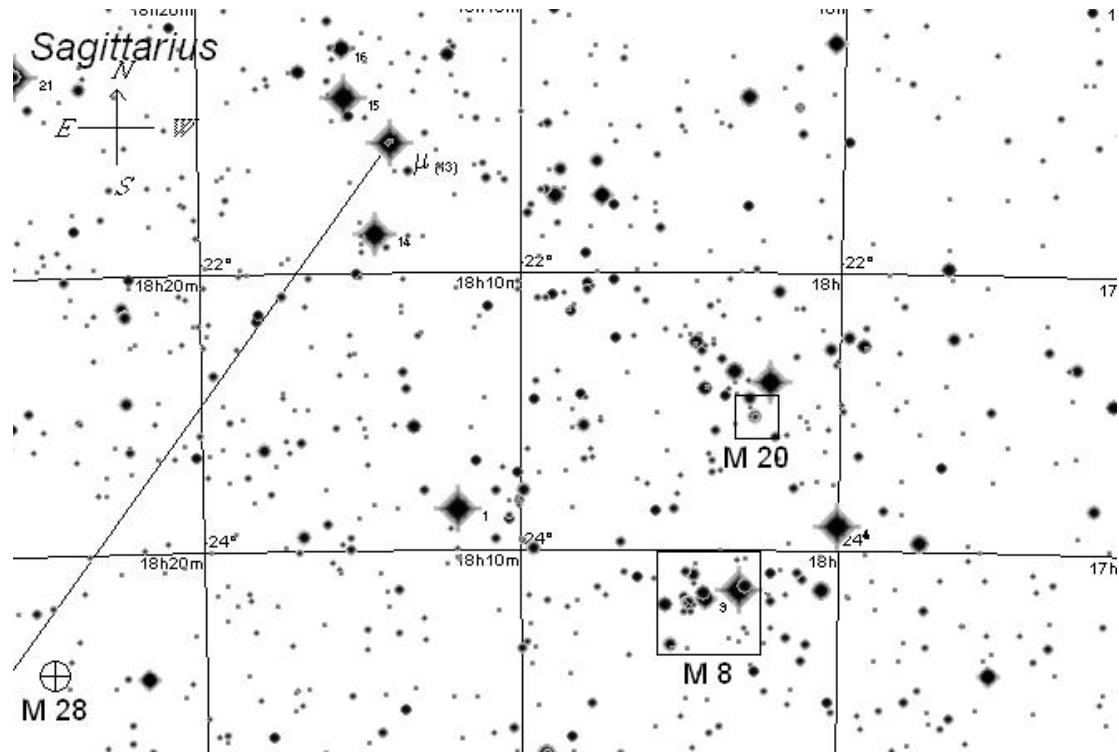
M28 is found less than a degree north east from Lambda, and although something of a poor cousin to M22, is still a showpiece in its own right. From a moderately dark site, you should be able to pick up M28 in binoculars, but it's not nearly as noticeable as M22. At around 18,000 light years distant, M22 is considerably smaller than its neighbor, and requires correspondingly larger telescopes to break it into stellar pieces. As with all globulars, take your time and delve into higher powers - 200x if your telescope and conditions support it.



As you increase magnification, look for an appearance of granularity on the outer edges, and for the arms and core to appear to break into individual stars. In 8" and larger scopes, this globular is a superb sight.

Now lets use M28 as a jumping off point to our next stellar pair: M20 and M8.

M8 and M20 - The Lagoon and the Trifid

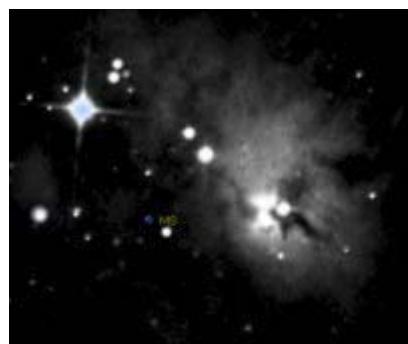


Scan about 4 degrees west of M28 (and just a little north), with a pair of binoculars or a rich field scope and you will soon hit an obvious soft glow. This is the M8, M20 complex - two disparate nebula, that form another showpiece in this region.



One of the first things you will notice is that M8 (commonly called the Lagoon Nebula), the southern most of the two, is visible to the naked eye on a good night. The second thing that comes to mine is that it's absolutely huge - it's full extent is around 3 times the size of the full moon! It's an excellent binocular target, and as such will only take the smallest of scopes to show the nebulosity and the associated open cluster 6530. Even in small scopes, a dark lane is visible between the nebula and the open cluster.

Deep within the brightest section of M8 - the "Hourglass Nebula" marks an active stellar nursery. Hubble pictures show the stellar winds from Herschel 36 (the brightest star in the region) have carved out funnels and rope like



structures. While this will be invisible to our typical backyard observer, you can spot several dark nebula strewn across the face of the nebula, including B88 and B89.

Beware, some folks confuse the low power views of the Lagoon with pictures they have seen of M20 - which lies just slightly north. The reason for this is because of the dark lanes that surround the Hourglass Nebula at its heart. Appearances can be deceptive.

While most observers tend to stick to low powers when perusing the Lagoon Nebula, you might try higher powers while inspecting the brighter portions.

In particular look for dark nebula surrounding the Hourglass - similar to the picture at right - What can you see?

In my 10" scope, I noted of M8 and NGC 6530 – "...this can be seen with the naked eye from my site. It appears as a small star cloud, just on the edge of the milky way. Through the telescope, best views were obtained at about 85 power. Nebulosity abounds in this region. This area certainly gives Orion's sword a run for its money as "most impressive" region. The dark channel that gives the lagoon its name is clearly visible, and the cluster (with hints of nebulosity throughout) provides a nice counterpoint to the area of bright nebulosity just off to the side."



From M8, scan upwards a degree or two, and you will find M20 - the Trifid nebula.

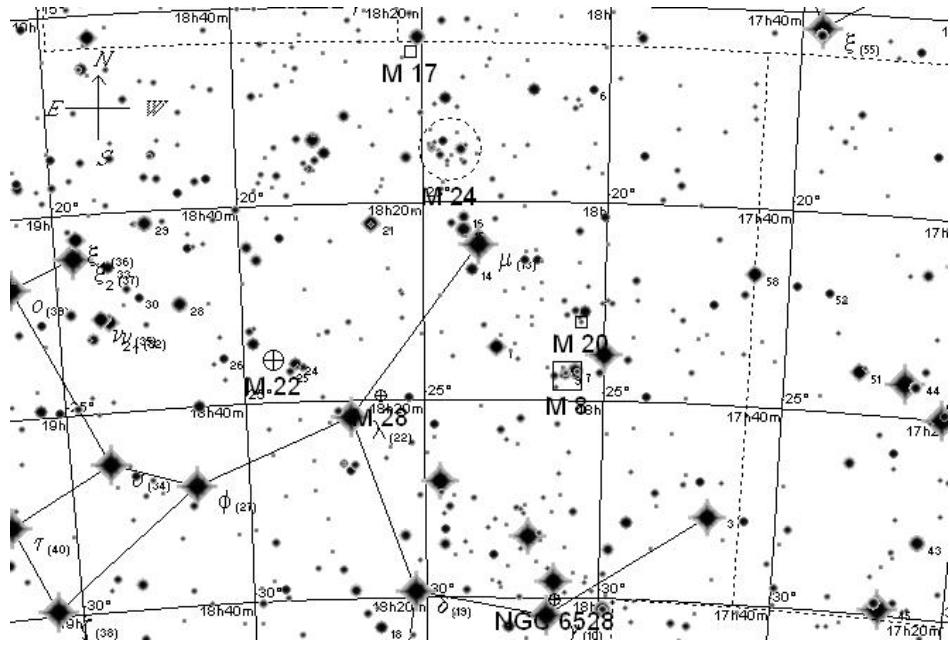
In fact, if you have binoculars or a rich field telescope, they will (almost undoubtedly) be in the same field of view.

If you were expecting the views of the trifid you've seen in images - you may be a little disappointed. It's smaller and fainter than M8, and after the photographic buildup, it's something of a letdown. Look for a faint glow (which may not be visible in smaller apertures) involved with an open cluster of stars. In binoculars, I normally have a difficult time spotting any nebulosity, while it's a fairly easy catch

with a 4" or larger scope, in fact, my notes indicate that a hint of the lanes was caught in my 4" scope but the view was much enhanced with the addition of a few inches of aperture. If fact, in my 10" scope, I found M20: "An outstanding object. A roughly circular nebula w/ central star(s), and three radial dust lanes clearly seen"

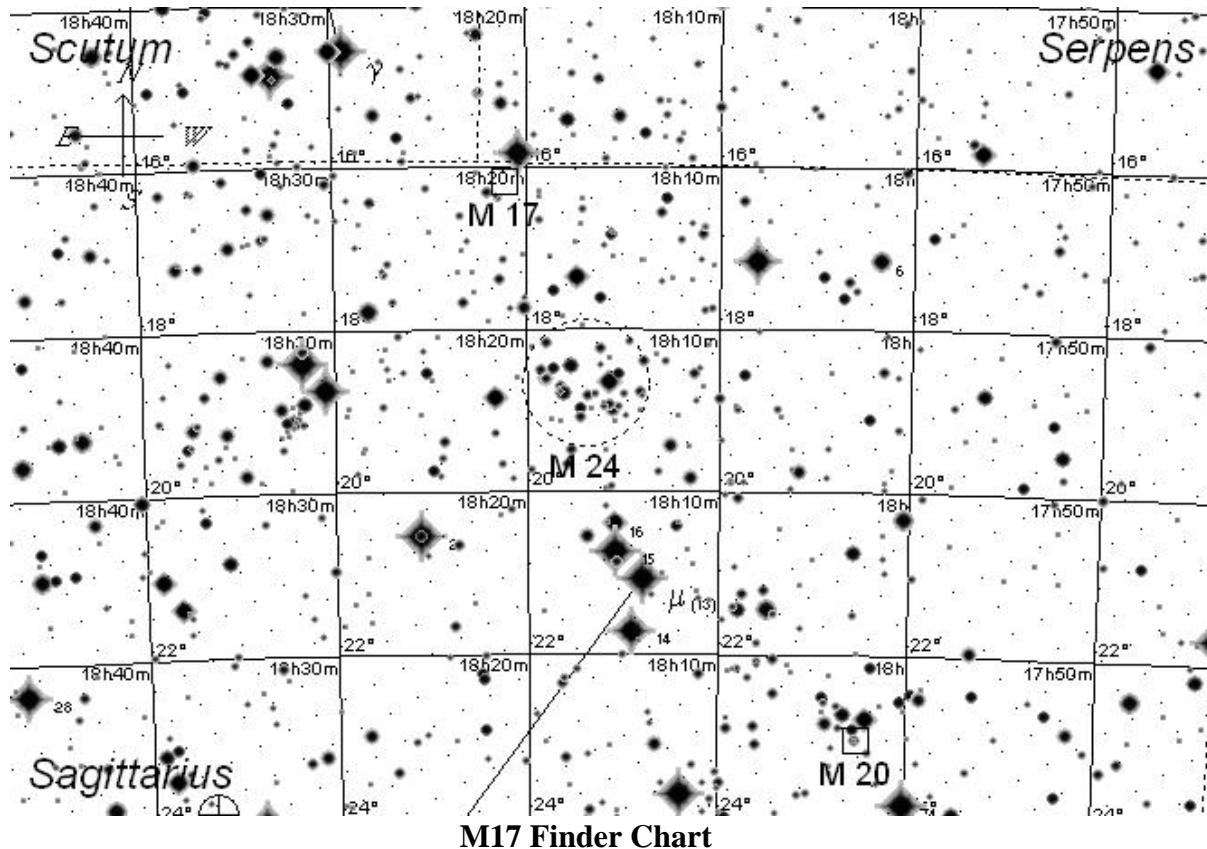
I'd also suggest trying both an OIII filter or a UHC filter for both M8 and M20 if you have either of them available, as several observers have reported they help.

M24 - The Small Sagittarius Star Cloud



Now lets move north east a bit. I hope you have a pair of binoculars or a wide field telescope. One of the best sights in the summer Milky Way has to be M24 - the small Sagittarius Star Cloud. While it's not a star cluster proper, it does, in fact, contain it's own star clusters - NGC 6603 and CR 469, as well as dark nebula B96 and B92. A beautiful object, and one that I could sit and watch for hours. While M24 itself is best viewed in smaller wide field instruments, if you are lucky enough to have a larger scope, you should find enough in M24 to keep you entertained for a while.

M17 - The Swan or Omega Nebula



M17 Finder Chart

Now continue north and east a bit, and you'll soon come across the Swan. Visually, I find this second in splendor only to M42 - the Orion Nebula. Like M42, the Swan (also called the Omega or Horseshoe Nebula) is a stellar birthplace. And unlike the Centaur itself, I can easily see how the swan got it's name.

It's initial "discovery" was by Swiss astronomer Phillippe Loys de Cheseaux, in 1746 but unfortunately, he didn't get much press, and Messier "rediscovered" the nebula and cataloged it in 1764.

de Cheseaux notes read:

Finally, another nebula, which has never been observed. It is of a completely different shape than the others: It has perfectly the form of a ray, or of the tail of a comet, of 7' length and 2' breadth; its sides are exactly parallel and rather well terminated, as are its two ends. Its



middle is whiter than the borders; I have found its RA for this year as 271d 32' 35" and its southern declination as 16d 15' 6". It has an angle [PA] of 50 deg with the meridian.

From <http://www.seds.org>

While my own notes with a 10" scope and a binoviewer read: "In a word – superb. Best views were at 175x (binoviewed) where a wealth of detail and structure were revealed. A binoviewer coupled with the dual Naglers offered the supreme space walk experience, and one could just literally fall into the nebula. Nebulosity nearly filled the fov, and the "Swan" was quite evident. Structure was easily visible inside the western portion of the bottom bar which forms the base of the "Swan". Extremely impressive sight!"

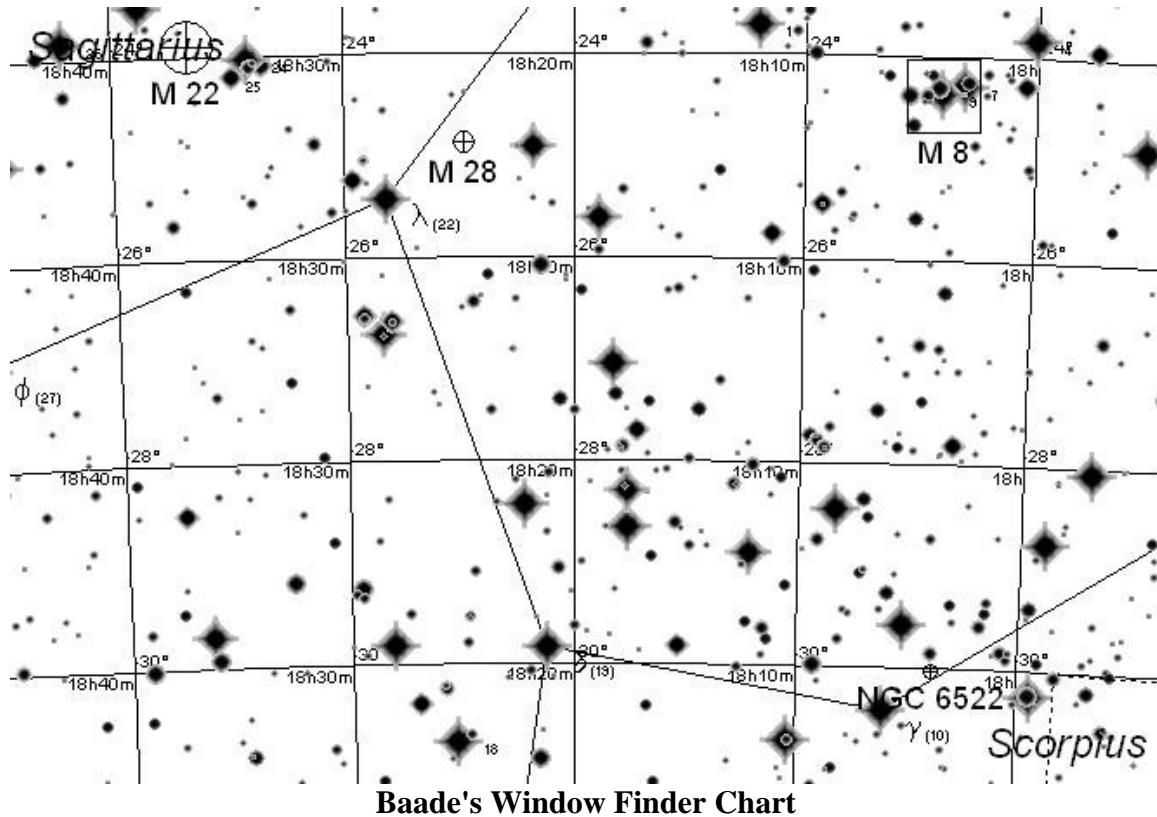
If you have a nebula or an OIII filter, now is the time to try it out.

This month, I've got two challenge objects for you. Bernard's Galaxy and Baade's Window.

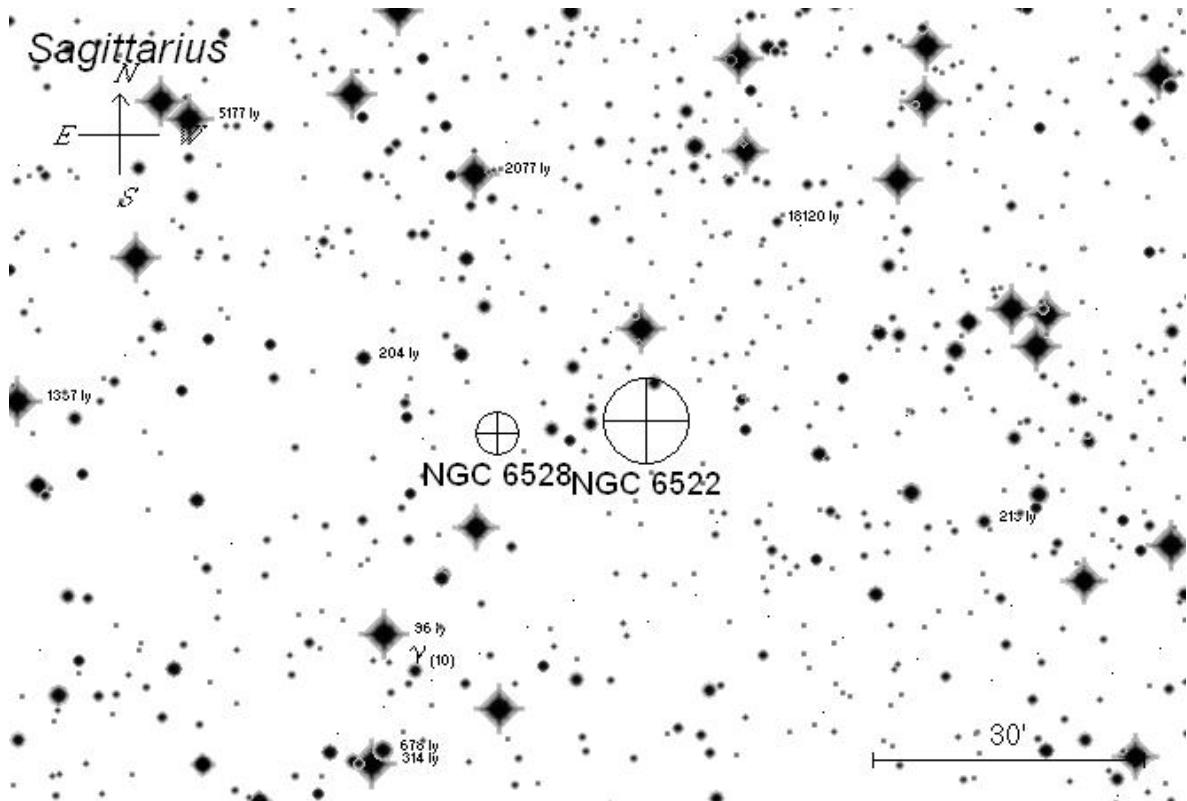
As you look toward Sagittarius, be aware you are looking toward the center of our galaxy. In fact, the precise center is located about 4 degrees WNW of 10 Sagittarii (Gamma), however, as we look in that direction, we are confounded by the dark dust clouds of the great rift. From our vantage point, at optical wave lengths, the actual center is obscured. However, Walter Baade, working with the 18" Schmidt camera on Mount Palomar located a window in Sagittarius - a short (angular) distance from the core itself - that allowed him (and us) to peer through the dust surrounding the galactic core and get a glimpse of what's out there..

Challenge Object: Baade's Window

There are two readily visible globulars that lie in the area known as Baades Window: NGC6522, and NGC6528. Note, to ease congestion on the map, I'm only showing the brighter of the two on the general finder chart - the other lies very close and will be in the same moderate power field of view.



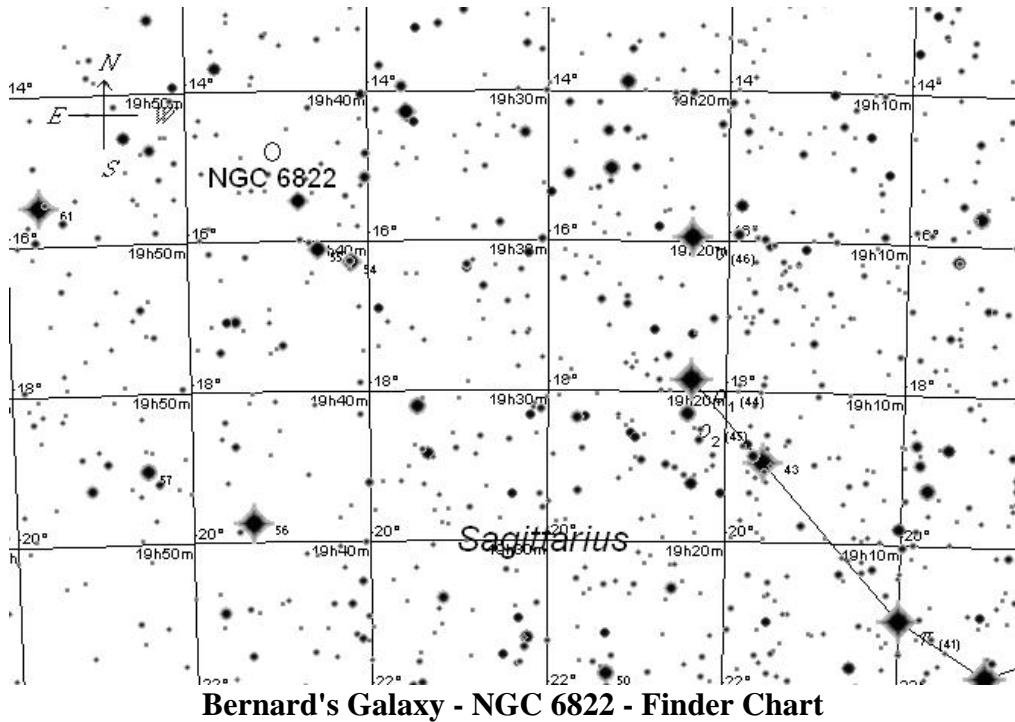
Look down near the spout of the Teapot - the lower right hand corner of the finder chart - and you will see I've plotted the brighter and larger of the two clusters: NGC 6522. Once you are in the general area, make use of the following chart:



Baade's Window Eyepiece Chart

As you can see, both globulars should easily fit into the same field of view. If you can spot these guys, you will find they aren't nearly as impressive as M22, but for me, at least, they generate a real sense of wonder when I realize that I am looking at objects that lie a good 25,000 light years from us, and much closer to the galactic core - a mere 2,000 light years.

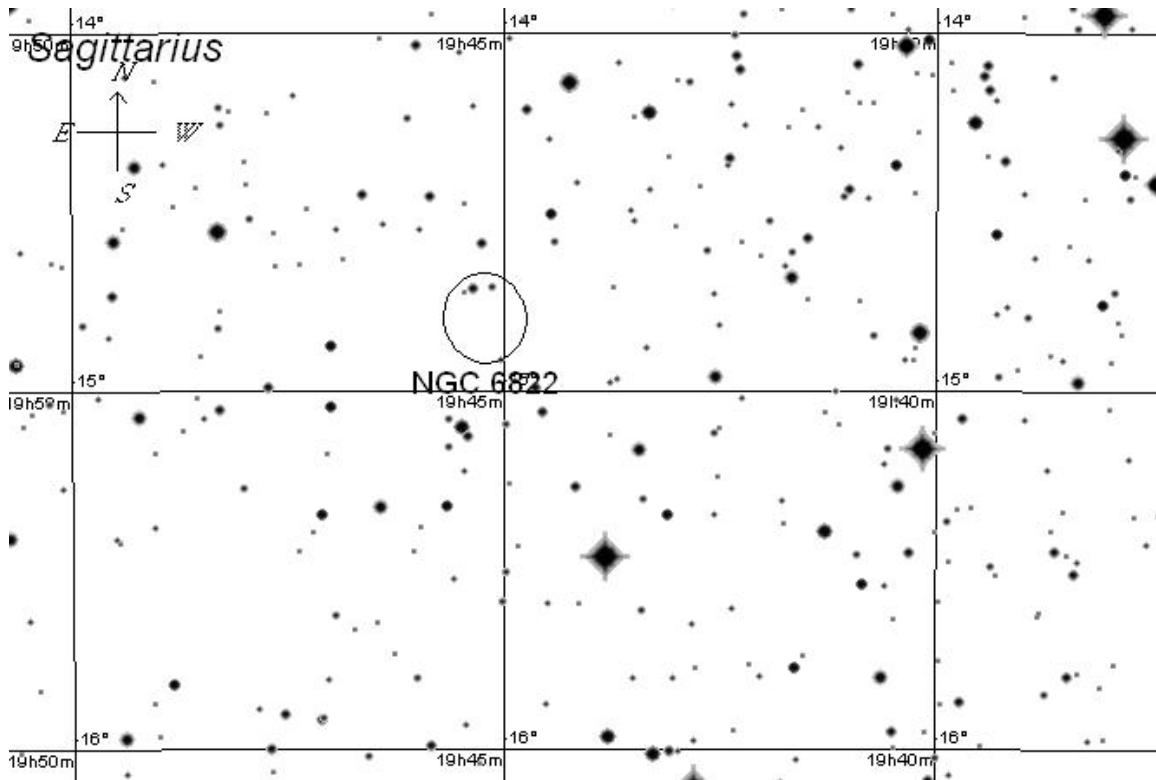
Challenge Object: Bernard's Galaxy - NGC 6822



Although it was catalogued much earlier, E.E. Bernard's name is most closely associated with this irregular member of the local group. He first observed it on August 17, 1884 with a 5 inch refractor. Similar to the Small Magellanic Cloud in composition and structure, this galaxy is (amazingly) purportedly catchable in binoculars from a dark sky site.

Although it's listed as a prime target for a rich field scope, nearly every aperture has something to offer here. My most notable observation came through a 10" SCT. When the field was centered, there was a granular brightening toward the center of the field. Aligned roughly North/South, at the magnification we were using, it almost looked like classic illumination fall off towards the edges of the field of view. As someone who spends a fair amount of time with a pitifully small amount of aperture looking for extremely dim things, I was surprised to see a target like this in a fairly large scope.

The one recommendation I have, is to be prepared for the rather large size of this object. The listing for the magnitude is 8.7, but this is deceptive - a much better guideline to its visibility would be to look at the magnitude and surface brightness - according to one source, the surface brightness is an astonishingly low 22.9 magnitudes per square arc second. Yet despite this, it's certainly observable in small instruments.



NGC 6822 - Eyepiece Finder Chart

By no stretch of the imagination does this little tour cover all of the objects in Sagittarius - it's not even all the Messier objects - there are nine more! Sgr is a haven for globulars, I'd strongly suggest you take out your rich field scope and spend some time scanning this area of the sky - especially along the bottom of the Teapot - you never know what you might turn up!

Next up is Delphinus - I'd love to include your observations, photos or eyepiece impressions of DSO's in that tiny constellation, so please send them in!

I'd love to hear of your experiences under the night sky - please feel free to e-mail me or send any observing reports to: tomt@cloudynights.com

Please indicate if I can cite your observations in future columns.

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