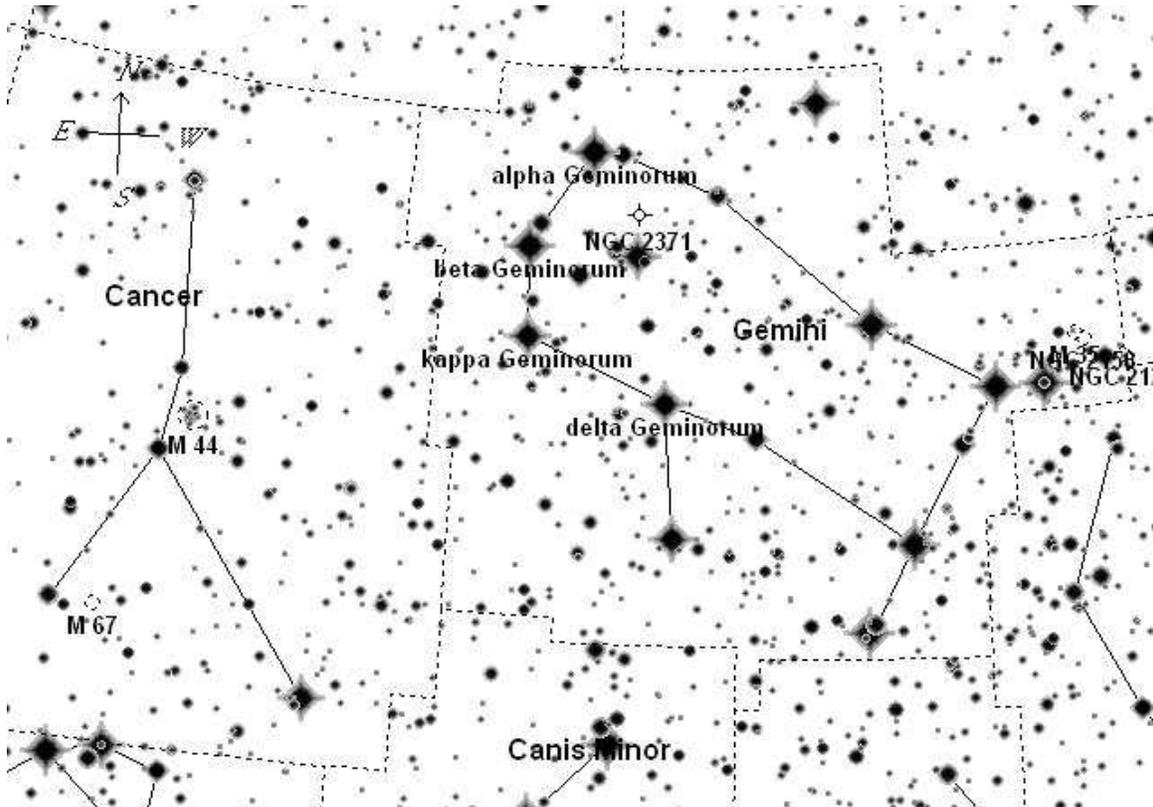


Small Wonders: Gemini and Cancer

A Monthly Guide to the Night Sky

by Tom Trusock



Wide field Chart

Target List	Name	Type	Size	Mag	RA	DEC
	alpha / Castor	Star		1.6	07h 34m 56.4s	+31° 52' 44"
	beta / Pollux	Star		1.2	07h 45m 38.7s	+28° 00' 55"
	M 35	Open Cluster	25.0'	5.1	06h 09m 19.3s	+24° 21' 05"
	NGC 2129	Open Cluster	6.0'	6.7	06h 01m 25.6s	+23° 19' 12"
	NGC 2158	Open Cluster	5.0'	8.6	06h 07m 44.9s	+24° 05' 51"
	NGC 2392	Planetary Nebula	54"	9.1	07h 29m 29.8s	+20° 54' 09"
	M 44	Open Cluster	70.0'	3.1	08h 40m 15.9s	+19° 39' 18"
	M 67	Open Cluster	25.0'	6.9	08h 51m 41.8s	+11° 47' 52"
Challenge Object	Name	Type	Size	Mag	RA	DEC
	NGC 2371-2	Planetary Nebula	1.0'	11.2	07h 25m 54.2s	+29° 28' 48"

A SkyMap Pro Target List for these objects is [available](#).



This month we'll take a look at the celestial twins, and a short side trip into the crab.

Cancer (the Crab) and Gemini, (the Twins) are both constellations of the zodiac, but that's about all they have in common. Cancer is far fainter than Gemini, and in fact the faintest of the 12 zodiacal constellations. Cancer's brightest star, Beta Cancri, shines at a mere 3.52 magnitudes. For the small scope owner, Cancer contains two nice open clusters (M44 and M67) and a fairly bright galaxy (NGC 2775). Ironically, I've often found M44 (The

Beehive) to be more conspicuous than the constellation that contains it!

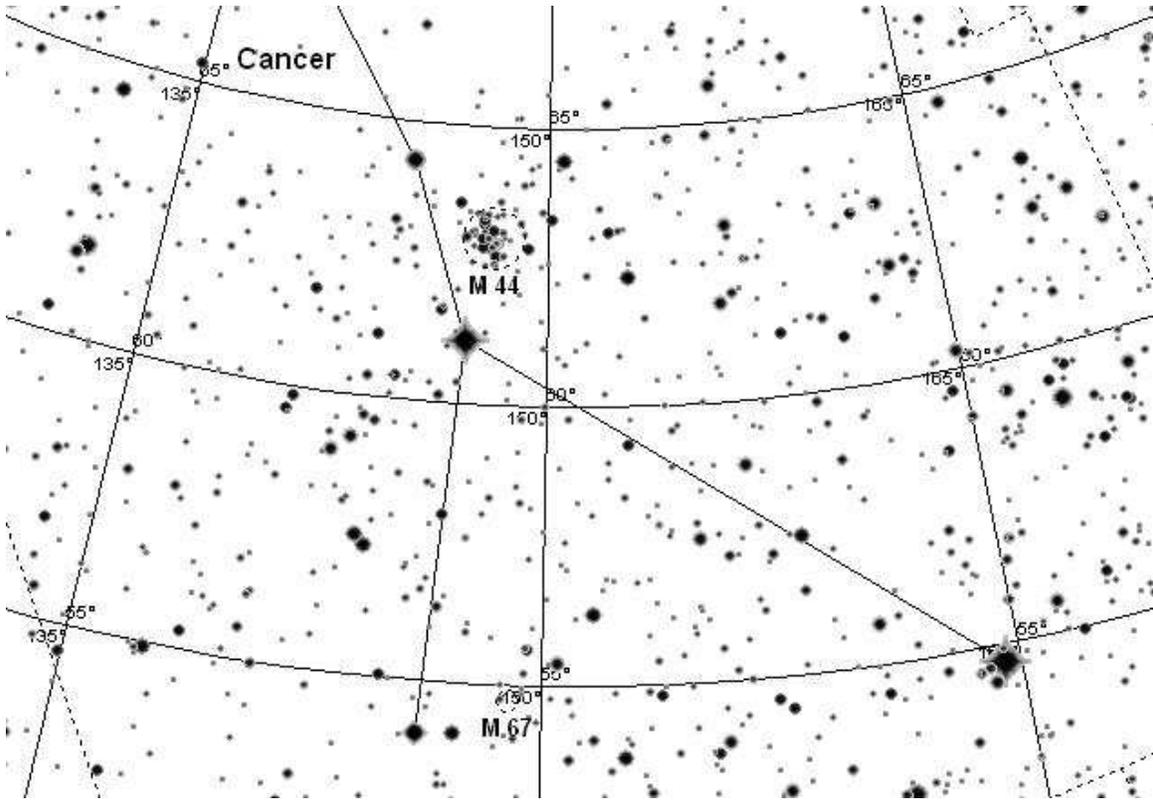
Gemini is a little easier to spot. To my eye, it's one of the hallmarks of late winter. It's brightest stars conveniently form two parallel rows. Although there's only one Messier object, Gemini contains a host of nice objects for the small scope owner and thus we'll spend most of our time there this time around..

It's brightest stars (Castor and Pollux, which form the heads of the twins) are named after two half brothers of greek legend. Castor, the son of Leda and Tyndareus was a mere mortal, but his half brother Pollux was the product of a union between Leda and Zeus, and thereby (like all twins of ancient legend) immortal. After Castor was killed, Pollux begged Zeus to let him share his immortality with Castor. Zeus created the constellation Gemini - thus allowing them to spend 1/2 the year in heaven (above the horizon), and the other half in hell (note that like all constellations Gemini sets in the west - the direction of the Greek underworld.) In recent correspondence, Collin Smith pointed out that the twins (Castor and Pollux) are even referenced in the New Testament (Acts 28:11) as the protectors of sailors. Their presence on board a ship was signified by a ball of electricity in the uppermost rigging of a ship - a phenomenon today known as St. Elmo's fire.

Castor is a brilliant white class A star and is actually the fainter of the two, regardless of it's Alpha designation. It's a good test of your optics and a challenge for the small scope owner as it's a multiple star of about 4" separation. Castor A shines at 2 magnitude while Castor B is at 3rd. A third component, Castor C, lies further away and shines at a much dimmer 9th magnitude. Spectroscopic examination shows that A and B are also binaries.

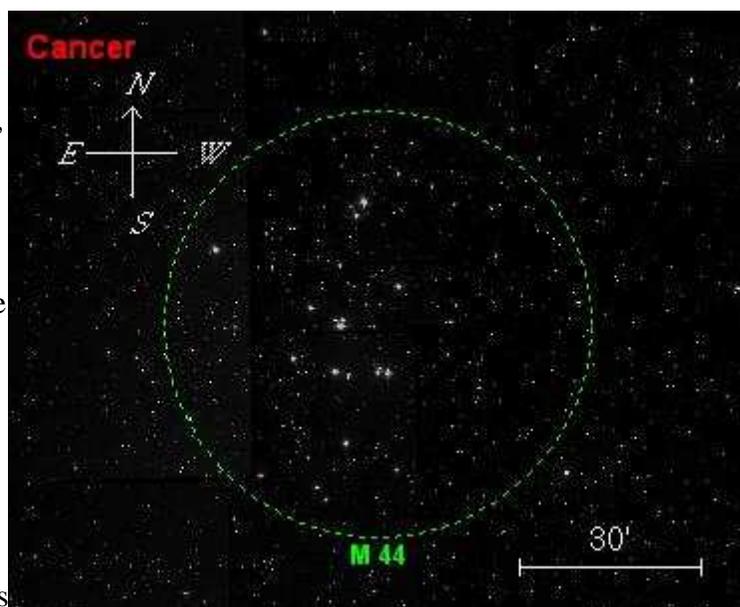
Pollux is a red giant that shines at magnitude 1.2. While not as interesting visually as his mortal brother, Pollux is a warm orange and provides a nice contrast to Castor - particularly in a small telescope or set of binoculars where the two can be viewed simultaneously.

We'll leave Castor and Pollux to their own devices for a bit and begin this month's tour in Cancer.



M44

Because the stars are so faint, Cancer isn't an easy constellation to get your bearings in. Indeed, like Coma Bernices, I've found observing from the city or the suburbs often means the constellation may not be visible to the naked eye. In fact, even from a dark site, M44, is more conspicuous than the constellation itself. If you are at a dark site, the easiest way to find the M44 is



to scan (with your naked eye) for a small cloud in the sky between Gemini and Leo. This is M44 - the Beehive - also referred to as Praesepe (the manger). If you are in the city or suburbia, scan about 15 degrees (three binocular fields or a hand and a half) to the south east of Pollux.

M44 is around 650 million years of age, lies a mere 515 light years distant and is one of the closest open clusters known.

To view the cluster, I find it's best to use a small telescope or pair of binoculars. The cluster itself is at least a degree in size, and personally, I find open clusters are best framed in field of view 3+ times the width of the cluster. For M44 in particular, I find a 2.5 degree or larger TFOV gives me my best views. It's sprawling size means this is one target that you could scan right over in a large scope without noticing.

If you are using a small scope or binoculars, you'll know when you've found it. While it looks open, scattered and somewhat difficult to distinguish from the background stars in the DSS image above and in John Krawczyk's image below, there's really no mistaking it. Of all the telescopes I've used over the years, I find I prefer rich field refractors in the 3-4 inch class coupled with wide field eyepieces such as a 35 panoptic when directing my gaze towards the manger.



M44 - Courtesy John Krawczyk

Walter Scott Houston points out that the ancients considered the invisibility of Praesepe to be an omen of coming rain, and that modern amateurs can use it as a judge of sky transparency. Scotty has an interesting paragraph on the evolution of it's name:

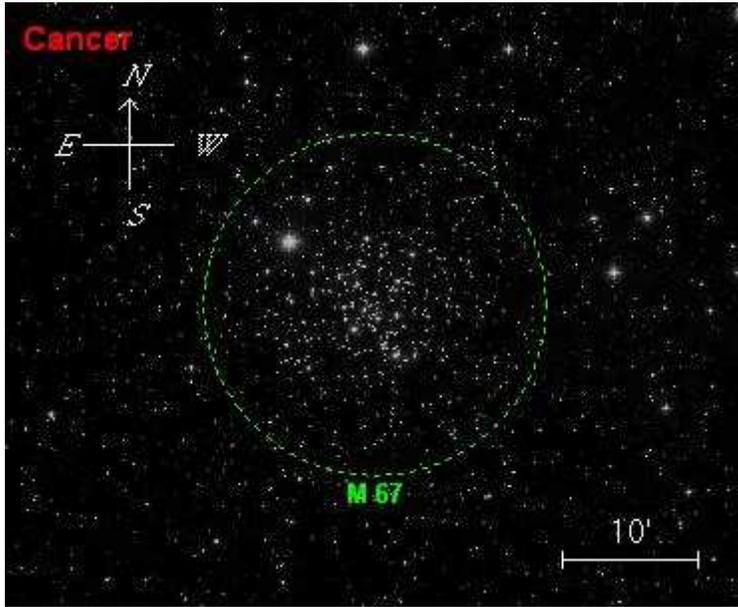
"The name Beehive is apparently of fairly recent origin. To Hipparchus it was the Little Cloud; Aratus called it the Little Mist; and Johann Bayer termed it Nubilum (cloudy sky). Astronomers of the 16th and 17th centuries called it the Nebula..."

There's some debate over the naked eye resolution of M44. It's usually held that it's extremely difficult to resolve but there have been some recorded instances. One amateur logged it from a commercial airliner while flying at 37,000 feet, and another observation was by noted observer Steven James O'Meara while at the 9000 foot level of Mauna Kea. Looking at the stellar magnitudes, it seems it would be possible to get some resolution from a very dark site. SkyMap pro shows there are 10 stars that are brighter than 7th magnitude, and three brighter than 6.5. I've never managed, but given a good night, who knows exactly what's possible?

M67

Our other Messier object in Cancer is also an open cluster. At 3.2 billion years of age and 2600 light years distant it presents a stark contrast to its younger, nearer neighbor.

This is another target that can be picked out in binoculars, but I find my best views of M67 to be through a telescope. M67 offers something for nearly every aperture. It's rich



and bright, thus makes a wonderful target for small telescopes, and yet because of its small size and concentration it's visually interesting in larger scopes as well.

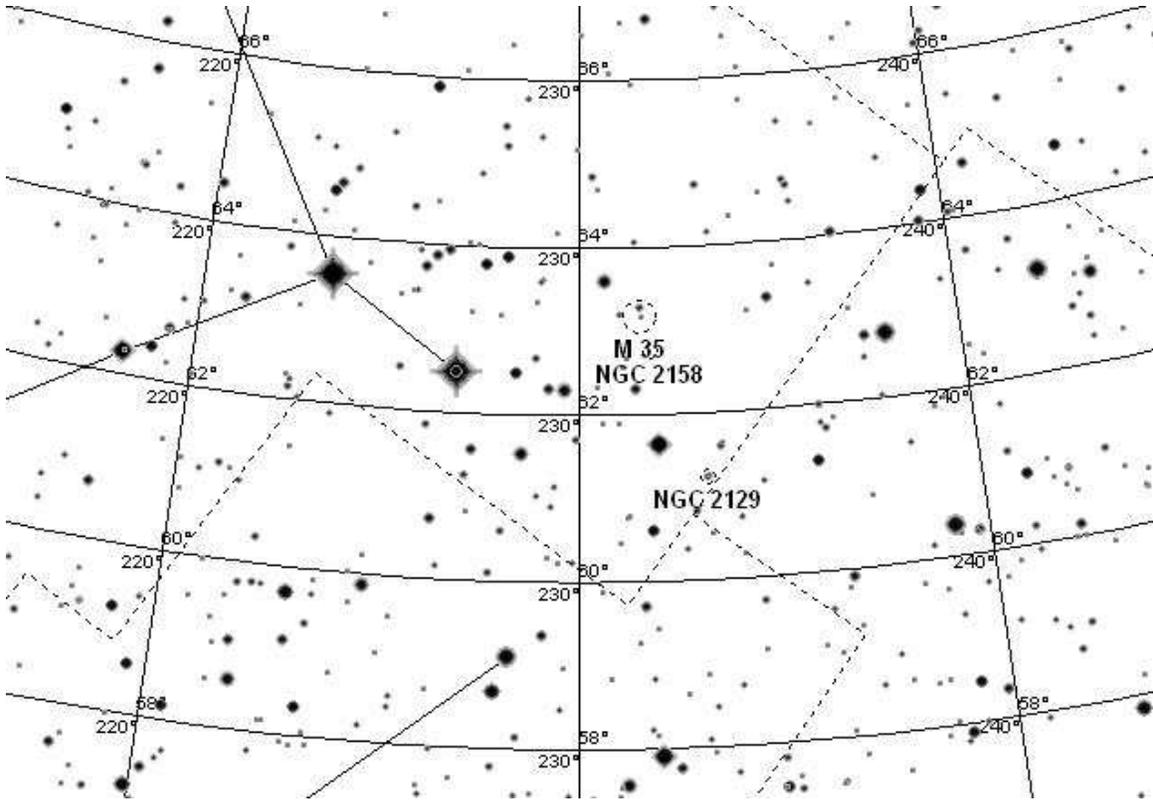
Telescopically, I find that it stands out from the background a bit better than its nearby companion, and my favorite views of this open cluster are through my 4" Apo using a 20mm Nagler (44x and a 1.5 degree field).

When gazing at M67, keep your eyes out for a sparse kite

shaped asterism of 10 to 12 stars in the 9th and 10th magnitude range to the south west - this is NGC 2678.

One other target worth tracking down in Cancer is NGC 2775. This nice galaxy is just a short distance north of the Hydra border, and actually belonged to Hydra until the constellation boundaries were redefined in the 1930's.

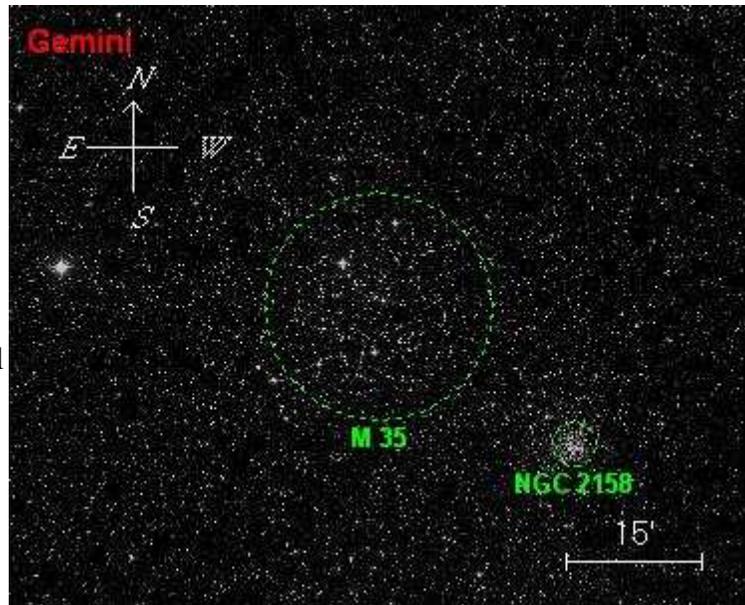
And now onto Gemini.



M35 / NGC 2158

Our first stop in this region is down near Castor's foot at the impressive open cluster M35. In a moderate sized scope M35 is nearly an overwhelming sight, a vast scattering of stars across the sea of night. Lying 2800 light years away, M35 is one of my all time favorite small scope clusters.

At mag 5.1, M35 should be visible to the naked eye at a dark site, but don't be discouraged if you can't pick it up. Like M44, (or perhaps even more so) it's strongly dependent on sky conditions.



Don't be fooled by the 20' or so scale shown here, the cluster's extent can easily appear larger - particularly in big scopes one can literally become lost in a sea of stars, as the cluster appears to swell all the way out to nearby 2158.

I find that my best views of M35 are typically through a 3"-8" scope at low to moderate powers. An interesting effect I've noted is that when viewed with small apertures working at low powers, M35 appears almost circular and has a hollow center. Higher powers increase contrast and bring fainter stars into view, thus spoiling the effect. I've never noted this in a large scope - presumably because the larger apertures gather more light and the fainter stars are visible from the start. It would be interesting to note the exact magnifications and apertures where the center begins to fill in - any takers for this celestial homework assignment?



M35 and NGC 2158 - Courtesy Matt Russel

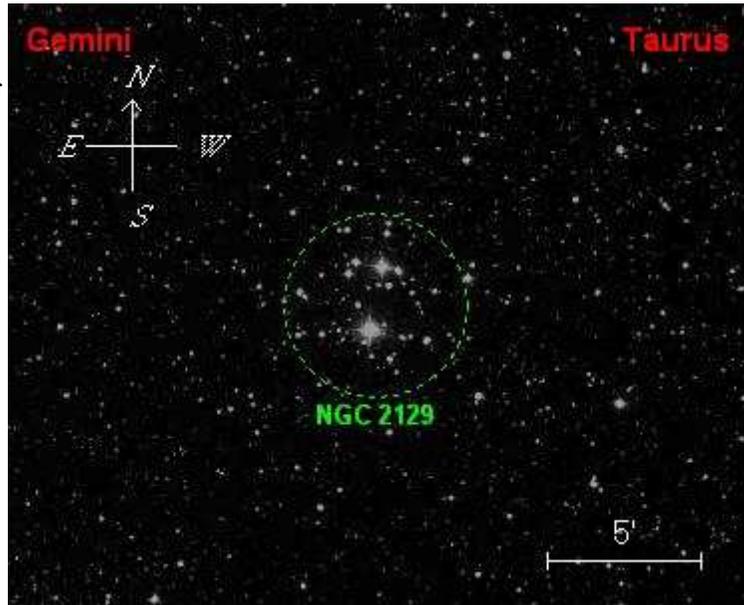
Just to the south west of M35, and in the same low power field of view lies NGC 2158. It's visible as a ghostly triangular patch in my 4" APO, but I've never noted any resolution with this apertures no matter the power. Taking a gander with an 8" scope changes the picture only slightly as although it becomes much brighter, my notes still don't make mention of any stellar resolution. Throwing the 18" at it however, changes the view completely, and resolves stars throughout. This small open cluster was occasionally (mistakenly) classed as a globular, but this is easy to understand, as it is remarkably compressed even when viewed with the 18" at 300x.

This is one of those targets that I seemed to overlook for years, and then something drew my attention to it. Now, I can't look at M35 without seeing if I can grab 2158 as well. While I haven't tried, I strongly suspect that it would be easily visible in even a 70 or 80mm telescope or large binos. What's the smallest aperture you've glimpsed the ghostly glow of NGC 2158 in?

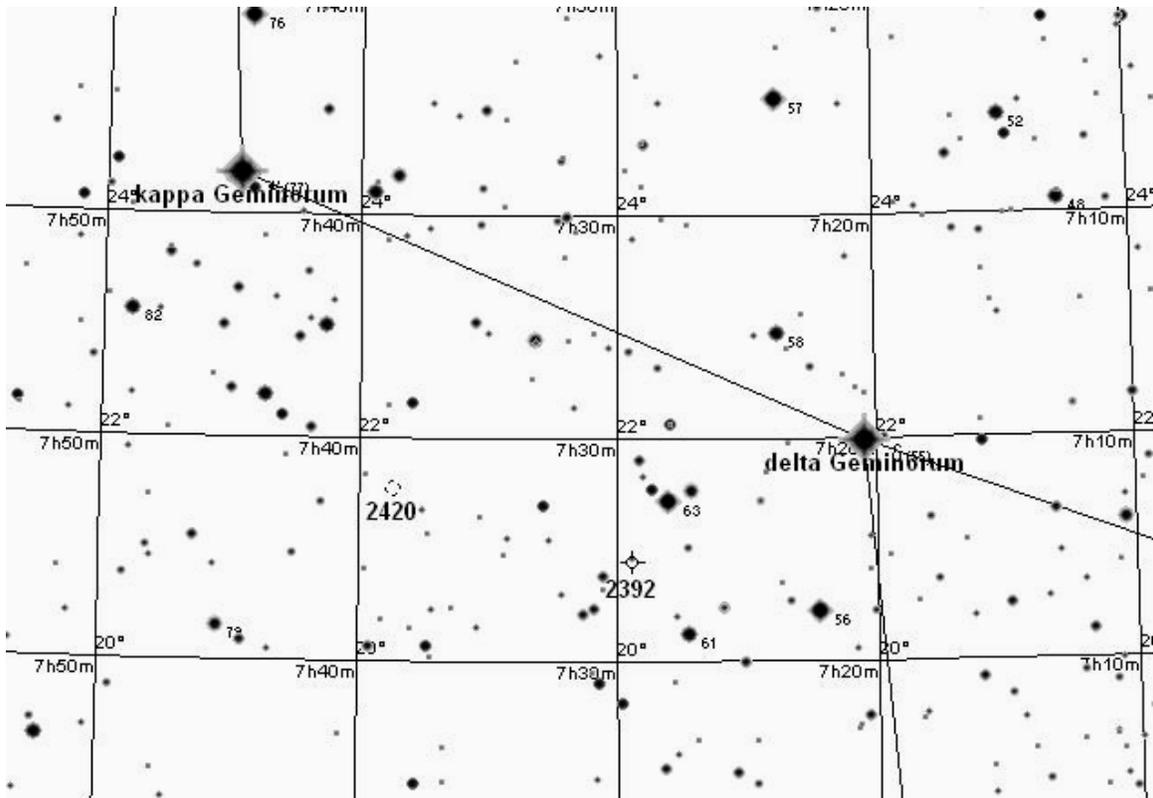
NGC 2129

Now line up M35 and 2158, and use them as a pointer to move about a degree and a half further south west. Keep your eyes open and you'll come across the sparse open cluster NGC 2129.

2129 consists of a dozen or so mag 7 to mag 11 stars in a sparse grouping. I've never found it to be all that interesting in an extremely small telescope, but as I move to larger apertures, my brain likes to play connect the dots, and often I'm struck by the resemblance to the constellation it resides in.



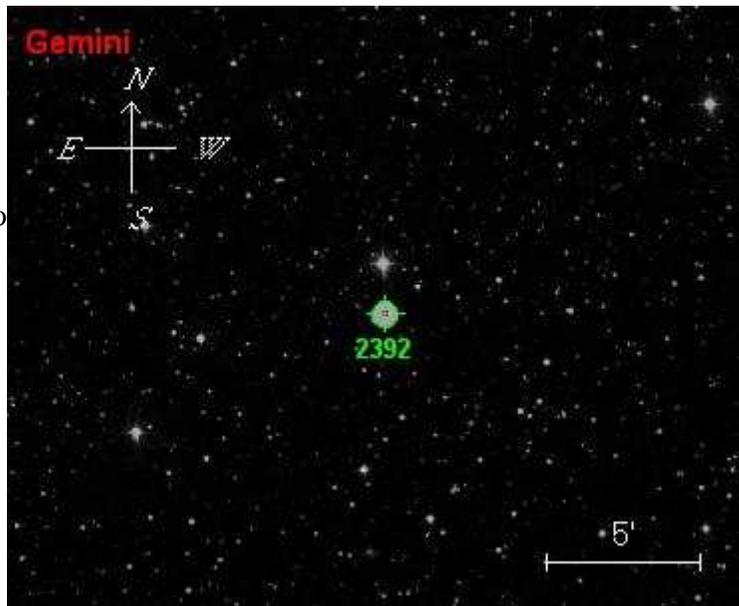
In larger scopes, this small open cluster bears a rather strong resemblance to Gemini (abet somewhat shorter and stouter), complete with it's own version of Castor and Pollux. I've noted this celestial mini-me effect most strongly in my 18" at moderate powers (180x), but rather suspect it would be visible in much smaller apertures. Take a gander and let me know.



NGC 2392 / Eskimo or Clown Nebula

Now lets move to the other twin (the easternmost), and up the outside of his body to Delta where his arm begins to junction off. Two and 1/3 degrees south east of Delta, we find the spectacular planetary nebula NGC 2392.

William Herschel called it "... a very remarkable phenomenon.", while his son John saw it as a bright star "exactly in the center of an exactly bright round atmosphere."



NGC 2392 should certainly be classed as one of the marvels Messier missed, and easily makes my list as one of the top ten targets in the night sky.

It's slightly less than 1/2 a magnitude dimmer than that jewel of the summer skies, M57, but it sits in stark contrast and makes the statement that planetaries are often vastly different from each other.

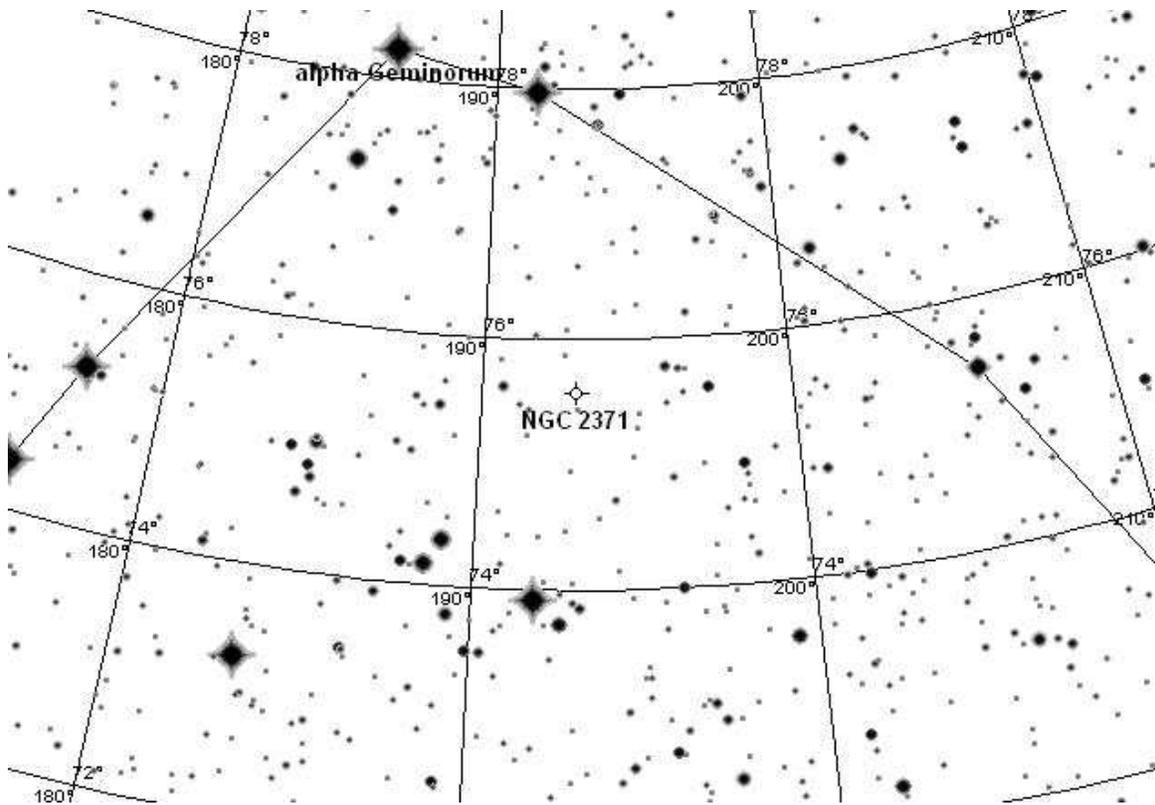
Where M57's central star is invisible to all but larger apertures and higher magnifications, NGC 2392's is easily seen with nearly any telescope at any magnification. Where M57 has it's distinct donut shape, 2392 clearly shows not one, but TWO shells to the observer lucky enough to study it with a moderately large telescope. Try using averted vision on the planetary - does the outer envelope appear to swell?

I recently had my personal best view of the Clown. While I was reviewing the target list for this month's column, I was out with the 18" Obsession and had the opportunity to turn my full attention upon it. At 475x, I was shocked at how much it resembled pictures I'd seen. It was an obvious blue green with two clearly apparent shells nested inside each other and the central star literally screamed at me. On prolonged examination, I noted that I glimpsed filamentary structure inside the shell. Except for the color, I'd have to say it looked remarkably like the wonderful image Carl Burton submitted this month. This is a spectacular object, and one of my all time favorites - possibly one of the best NGC planetaries in the northern hemisphere. Turn the largest aperture you have access to on it, and don't be afraid to use a UHC or OIII filter in conjunction with high powers to try and eek out every last bit of detail.



NGC 2392 - Courtesy Carl Burton

Challenge Object: NGC 2371-2 - The Gemini Nebula

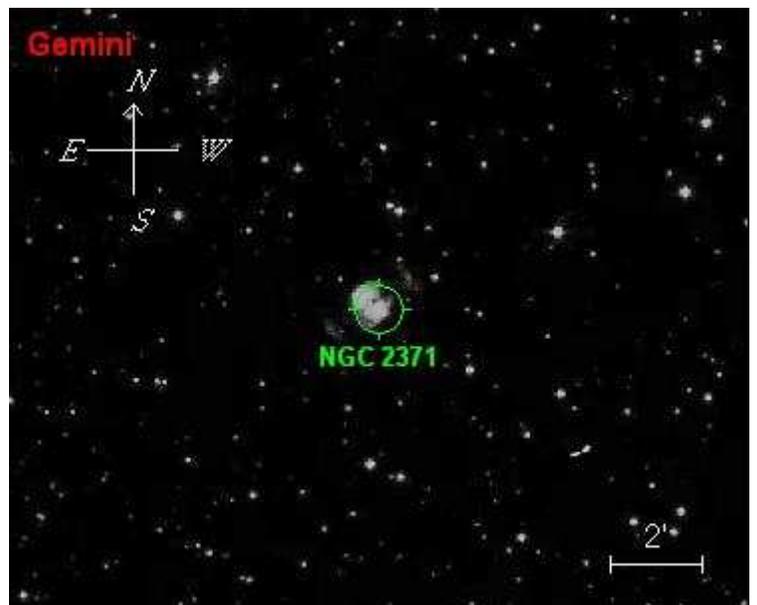


This month's challenge object is another planetary nebula in Gemini. It's bi-lobed and thus graced with two NGC numbers: NGC 2371 and NGC 2372.

It's rather small and faint, but my good buddy Ron B(ee) caught it in his TV102 at 146x and called it a "micro-dumbbell".

Having looked at it in 8" and 18" scopes, I'd have to agree. To my mind, it resembles nothing so much as a mini-M76. In the 18", with averted vision I can pick up hints of an outer shell - at least on the far extensions. The central star is listed at magnitude 14.8, and was visible with averted vision.

Micro-dumbbell, mini-M76, I've also heard it



called the Gemini Nebula and the Peanut Nebula. Whatever it's called, it's a strange object and provides a great contrast to our other planetary this month - NGC 2392.

Additional Reading:

This month, I'll head back into the realm of print and recommend a couple of excellent books for your library.

Deep Sky Wonders by Walter Scott Houston - one of the all time classic deep sky writers columns compiled and edited for book form. A fantastic read of recommended targets broken down in a month by month basis. Scotty was one of the all time greats, and his love for astronomy comes through in his writing. This is easily one of my favorite books.

The Messier Album by Mallas and Kreimer - another classic, unfortunately long out of print. Not nearly as in-depth as O'Meara's book on the Messiers, it's none the less quite valuable as a resource for the small scope owner. I find Mallas's views to be a bit more typical for the small scope owner than O'Meara's. If you can find a copy of this, I'd recommend adding it to your library.

The Bedford Catalog by Admiral William H. Smyth - one of the first observing catalogs, this was initially written in 1844, still available today (sort of - it's a highly edited edition) from Willmann-Bell. One difficulty you might have is converting the archaic catalog numbers to more modern designations. Conversion lists are available at SEDS for the interested reader. This is a true astronomical classic, and wonderful reading for those cloudy nights.

*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.*

Photographic Images Courtesy DSS: copyright notice
<http://archive.stsci.edu/dss/acknowledging.html>

Star Charts Courtesy Chris Marriott, SkyMap Pro 10 Printed with Permission
<http://www.skymap.com>

Special thanks goes to Collin Smith for his assistance in editing