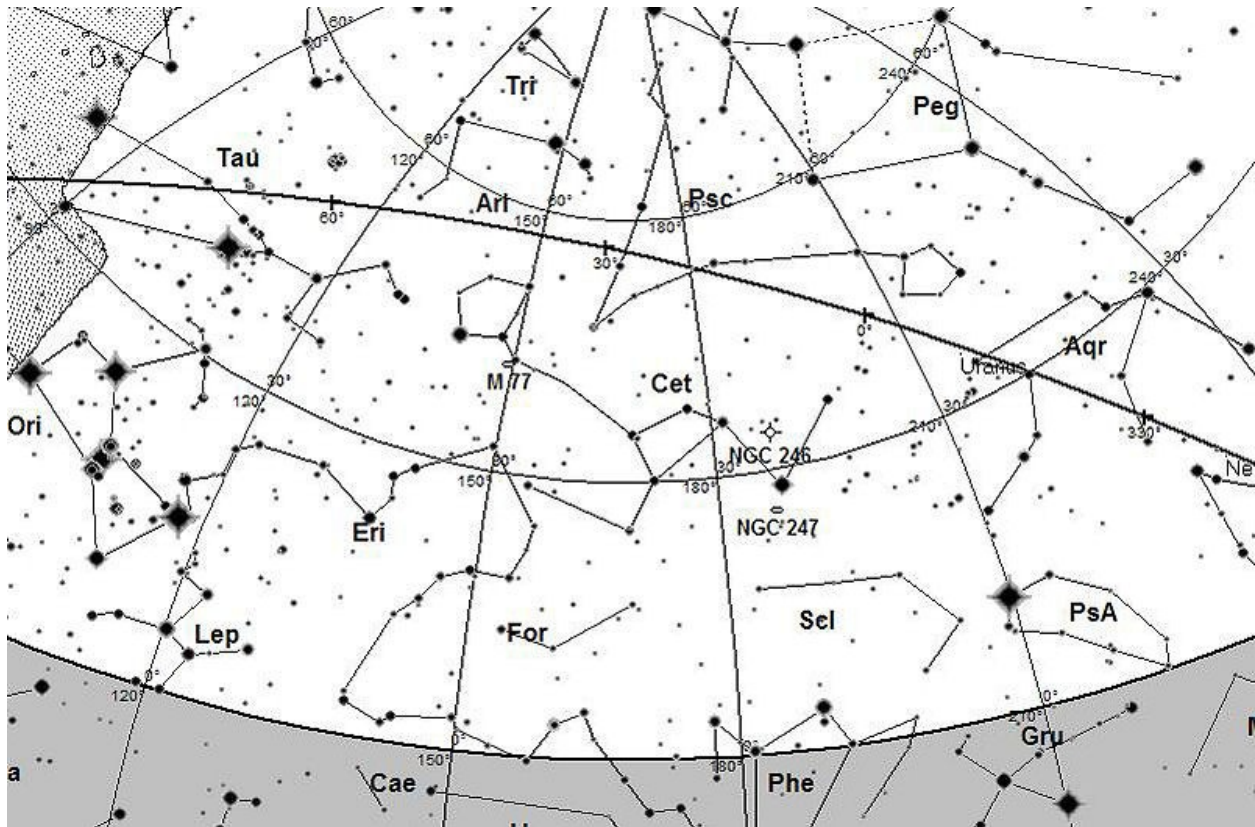


## Small Wonders: Quick Peeks - Cetus

Tom Trusock 12/08

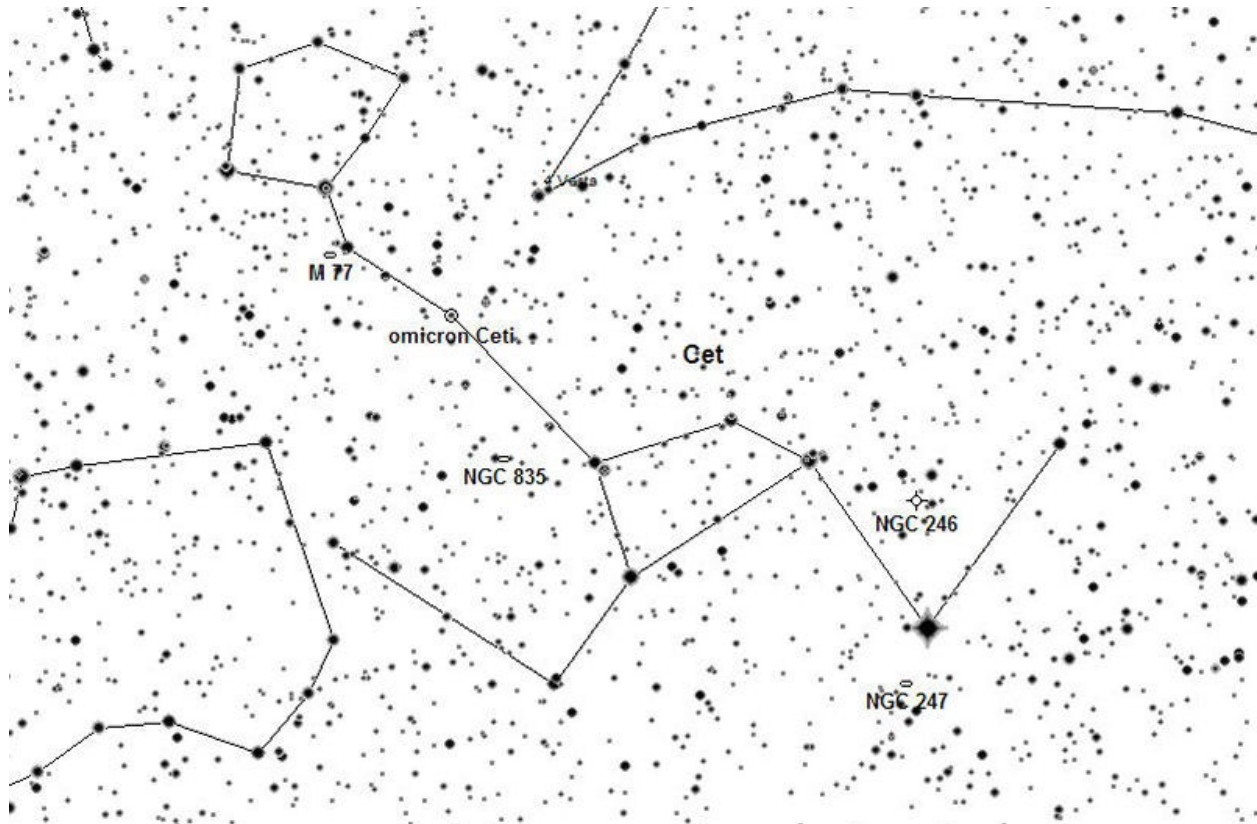


This month's quick peek targets are in the constellation Cetus, the sea monster (often referred to as the whale). Cetus has been associated with some form of sea creature since antiquity. It was the ancient Greeks to whom we owe the constellation, and is a portion of the story of Perseus, Andromeda, Cepheus and Cassiopeia. Cetus is the sea monster that Perseus slew to rescue Andromeda and win her hand in marriage. Cetus lies well off the summer and winter Milky Way and is rich in galaxies and galactic clusters. A quick sort through various databases yields 50 galaxies brighter than 13th magnitude, and an astounding 307 AGC and Hickson Clusters represent the uncountable galaxies in this area. We'll talk a bit about the brightest Hickson in the area in a bit. That said, there are a couple of other targets of interest as well.



*Widefield Finder Chart - Looking South, late December appx 10pm.*

The targets for this evenings quick peek are the variable star Mira, the planetary nebula NGC246, galaxies M77 and NGC247 and for those with big scopes, Hickson 16.



*Cetus Finder Chart*

Cetus is home to Omicron Ceti (Mira - Latin for wonderful). While there's some discussion that the variability of Mira was known in antiquity, While some authors state the discovery of Mira as credited to David Fabricius in 1596, Johann Holwarda is generally credited with the determination of it's period, and Johannes Hevelius popularized Mira in 1662 with the publication **Historiola Mirae Stellae - A Short History of the Wonderful Star**. Mira has a period of 332 days and although typical max is around mag 3.5 has reportedly reached magnitude .9 before dipping all the way to mag 10.1 Mira is binary, and was first resolved by the HST in 1995. Recent observations in 2007 have shown the existence of a protoplanetary disc around Mira B. Hipparcos data suggests a distance to the star of around 418 light years.

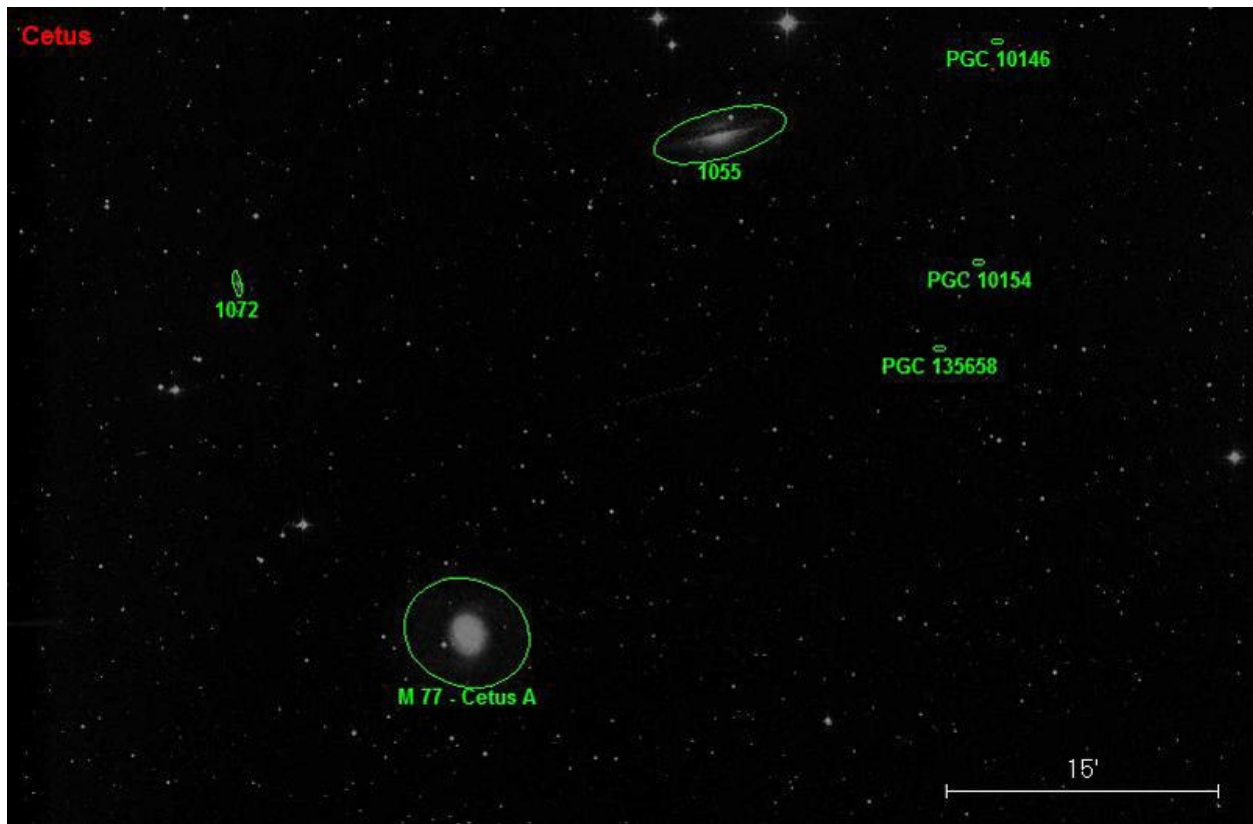


*M77 - Contributed by Hunter Wilson*

Possibly the best known galaxy in Cetus is the spiral galaxy M77. M77 (also designated Arp 37 and NGC 1068) was discovered by Mechain in 1780, and cataloged by Carl Seyfert in 1943 as the archetype of a class of disk galaxies with a highly luminous core called Seyferts. There are two different types of Seyfert galaxies: type 1 are characterized by signs of rapidly rotating gases around the center typifying the existence of a black hole, while type 2 show indications of slower moving gas clouds further from the center. M77 was thought to be the nearest example of a type 2 Seyfert until 1985 when data collected showed it may be harboring a type 1 nucleus. Given this, some astronomers think that the main difference between classification in some active galaxies is the angle we're viewing it at.

Additionally in 1913, Vesto Slipher (working at Lowell Observatory) discovered a large redshift in M77 - one of the very first such detections which led to the theory of the expanding universe.

From good skies, M77 can display an amazing amount of detail even in a small telescope. From the pristine skies of northern Michigan, I've glimpsed some structure in the galaxy on the best nights, and of course be certain to look for the bright, star like core. Like most face on galaxies however, what you see will also be very dependent on sky conditions. To make the most of your observation, try to observe M77 as it crosses the meridian.



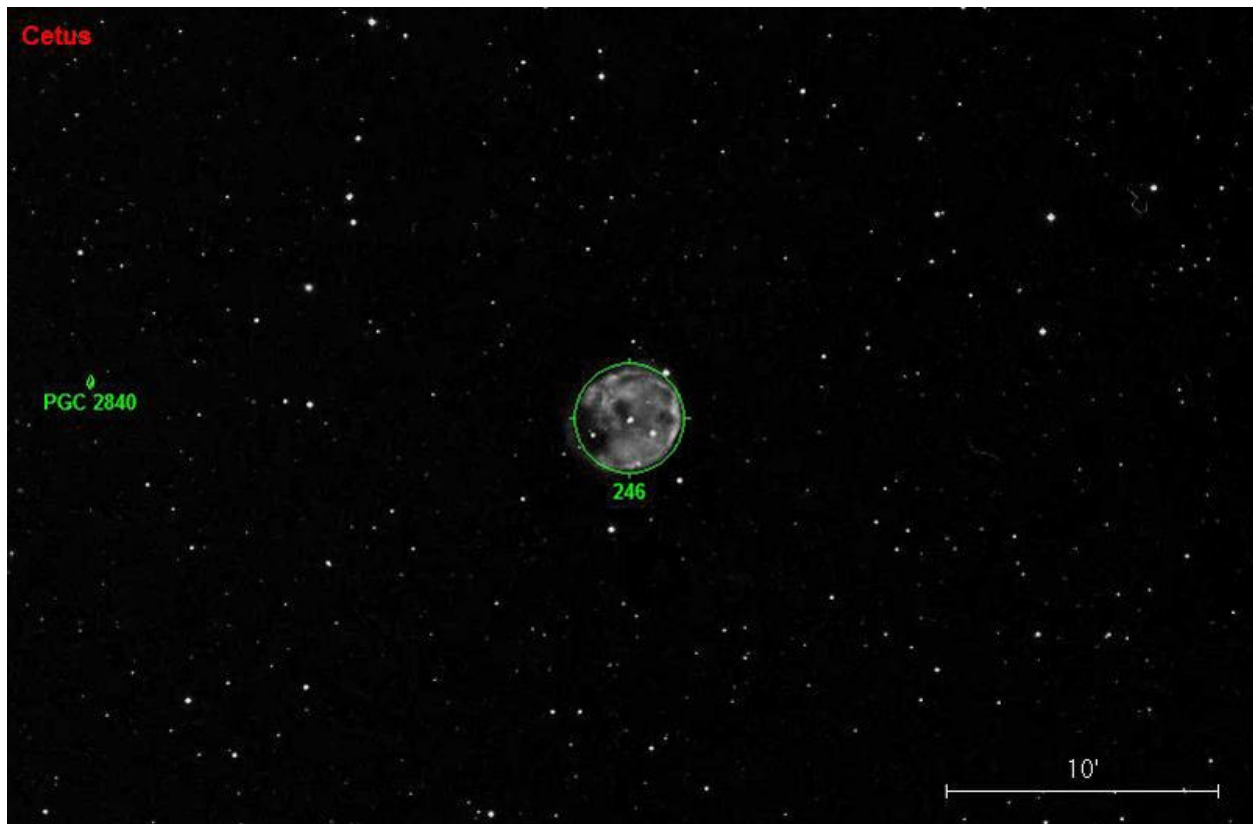
*M77 Region - DSS Image*

M77 is listed as about 7'x6' in diameter with a magnitude of 8.8.

Forum member Lard Greystoke, observing with a 10" Coulter, has the following to contribute about M77:

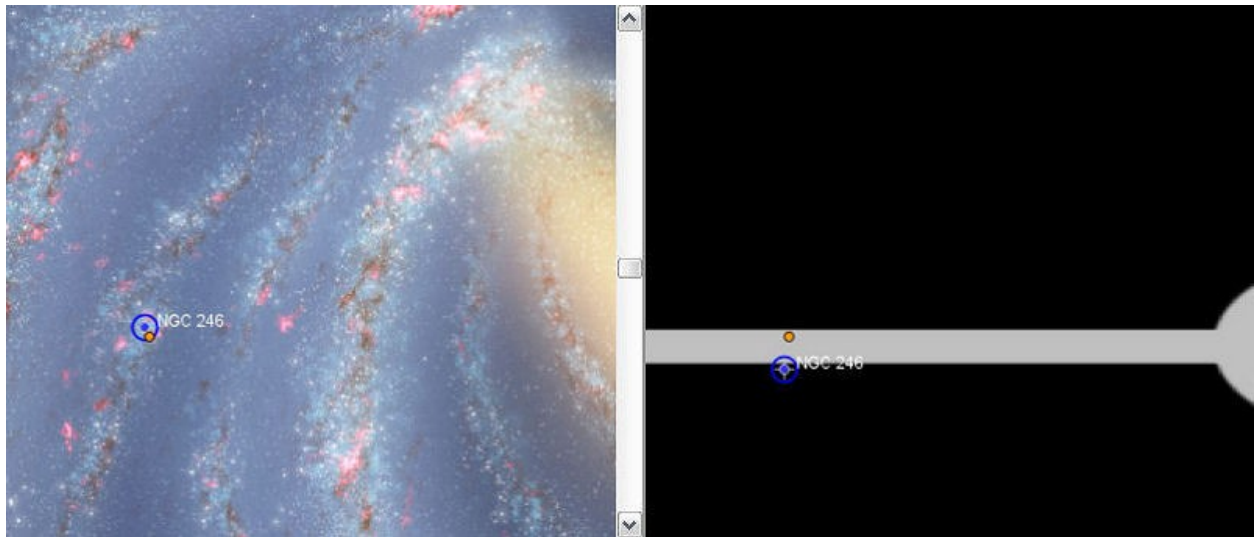
*M77 is in the other end of Cetus near Delta. For me it resembles a small globular more than a galaxy, recognizable in the 80mm finder, a round glow, high surface brightness, with a prominent star nearby.*

While you're in the region, keep an eye out for NGC 1055. About a half a degree from M77 this spindle like galaxy can easily lie in the same field of most telescopes given the correct eyepiece selection, and makes a very nice pairing. Moderate sized scopes begin to show some mottling in the halo.



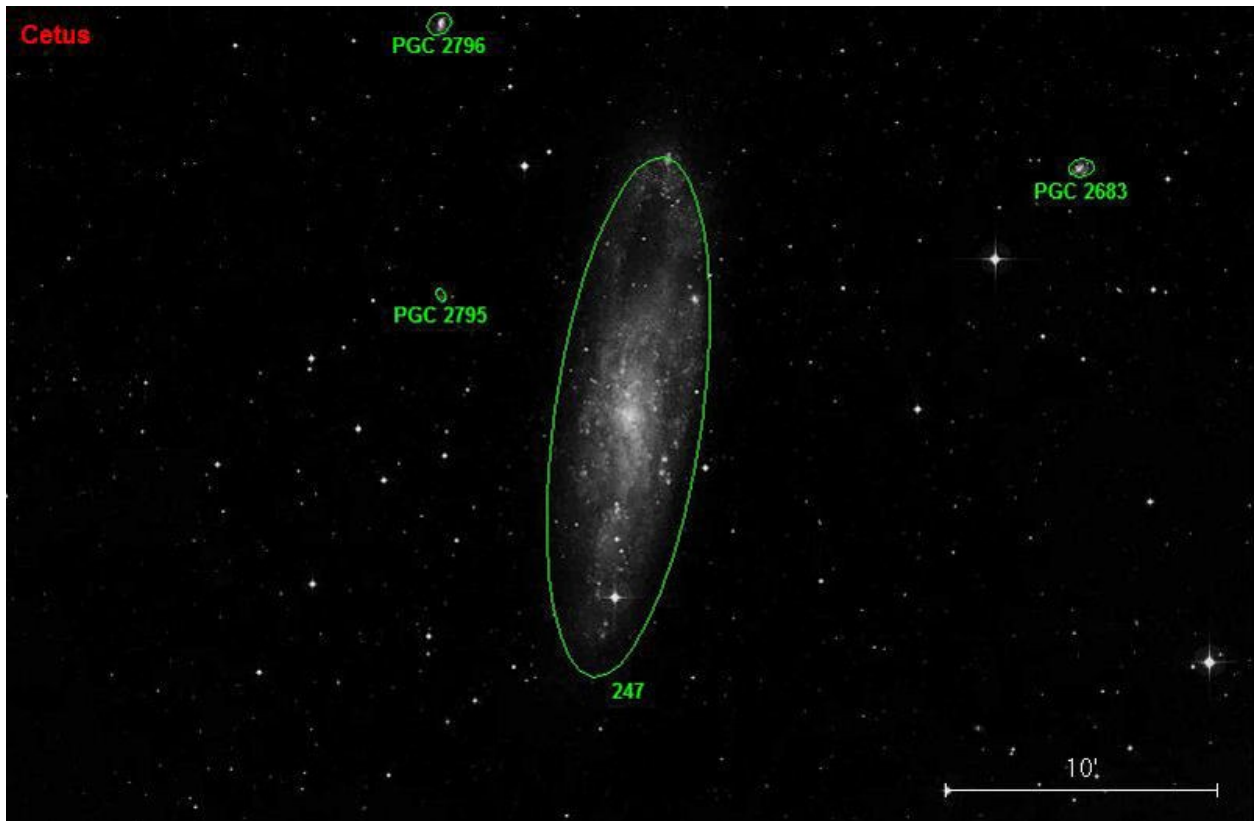
*NGC 246 - DSS Image*

Returning from the depths of intergalactic space to a mere 1600 light years from Earth we'll stop off at NGC 246, the Skull Nebula (also called the Pac-Man Nebula). This planetary nebula has a listed magnitude of 10.1 and a size of around 5'x4'. At that distance that means the true size lies somewhere around 2 light years in diameter. Although significantly dimmer, this round, diffuse glow reminds me quite a bit of the Owl Nebula in Ursa Major. There are 3-4 fairly bright stars scattered across the face, and larger scopes begin to show some structure. If you're not careful, it can be fairly easy to overlook the nebula as it can be somewhat overshadowed by the small "cluster" of stars across it. When viewing 246, experiment with different magnifications to find the minimum optimum magnification for detailed study. You want enough power to darken the background and raise apparent contrast, but not so much that details begin to be lost in decreasing contrast.



*NGC 246 is a relatively nearby companion. (We're the orange dot.)*

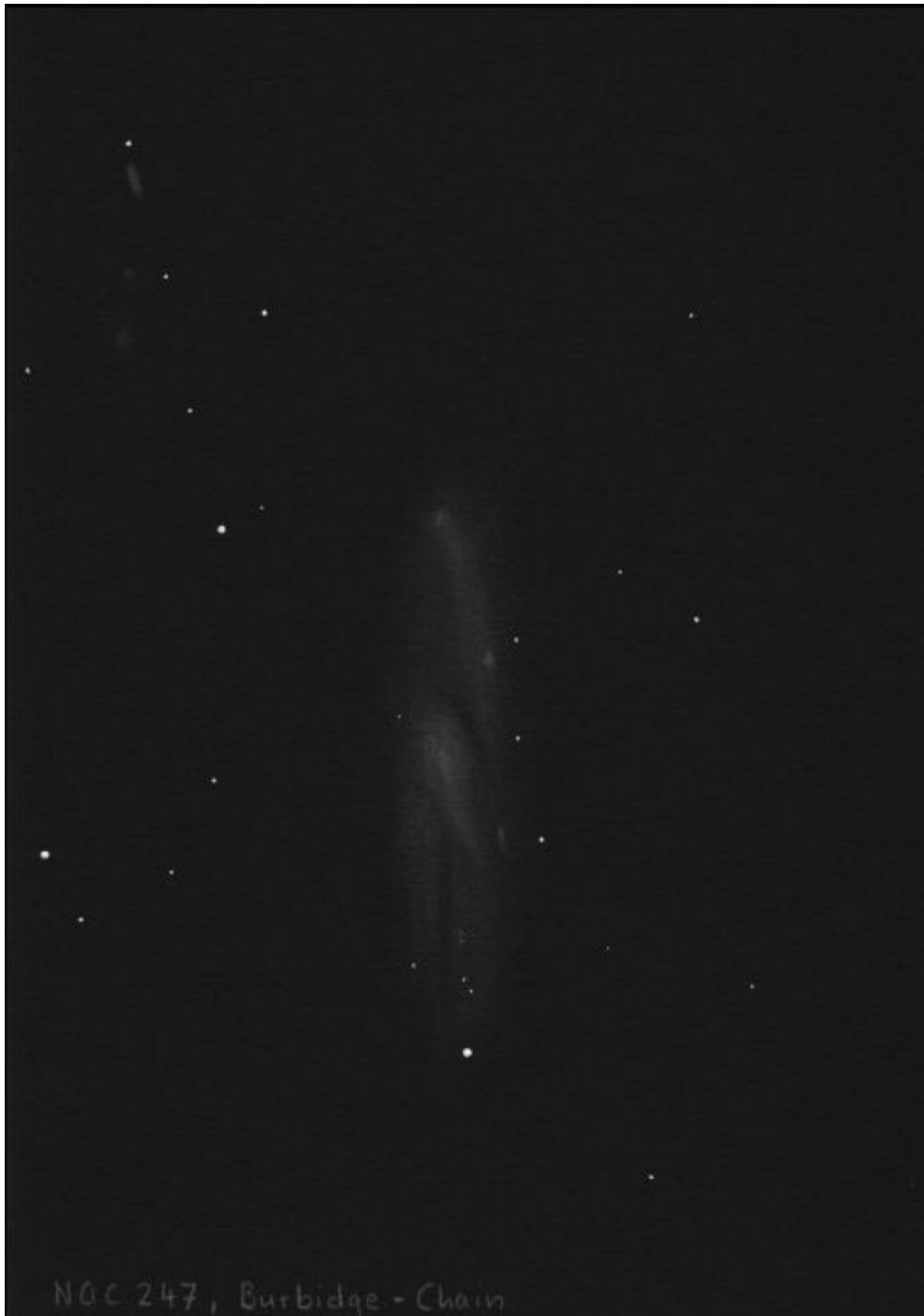
As an interesting aside, O'Meara (in *Deep-Sky Companions: The Caldwell Objects*) notes that Howard Bond of the STSCI states that the central star is a resolvable binary for amateurs with large telescopes. That's one trick, I've not managed to pull off. Have you?



*NGC 247 - DSS Image*

Back into the cold depths, lets take a peek and see if we can locate NGC 247. NGC 247 is one of the principal members of the Sculptor group of galaxies, the next closest galactic group to our own local group. Distance to the center of the Sculptor group is around 9 million light years, and while there are probably a couple of dozen galaxies in the group, it's dominated by some 6 large galaxies. The best and brightest of these is probably NGC 253 in Sculptor, but NGC 247 isn't that far behind. Other notables in this galaxy group include; NGC 300, 55, 45, 59, 7793, and NGC 625, if you do some digging, you'll note that about 5 of these are brighter than 10th magnitude. For backyard astronomers, I'd probably put the most interesting of the group at NGC 300, 253, 55 and NGC 247.



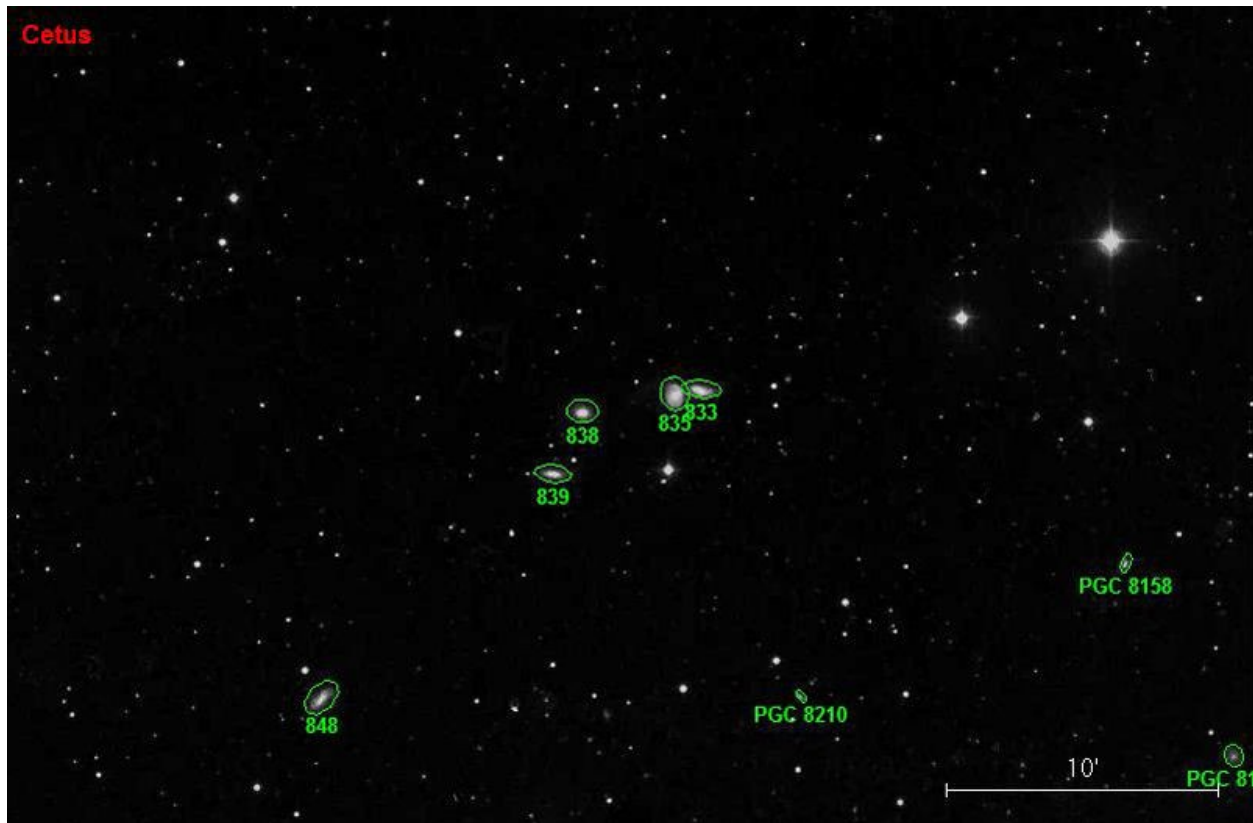


*NGC 247 - Contributed by Uwe Glahn*

247 is classed as an Sbcd with a listed magnitude of around 9.7. It's around 21' in size.

Photographs show a dark area enclosed by spiral arms on the north end of the galaxy. Is this a dust cloud blocking the stars behind? Or a true hole in the galaxy? I have no idea, and wasn't able to turn

up a definitive answer in my research. Phil Harrington reports that 247 is visible as a dim smudge in giant binoculars although I've never tried for it in anything smaller than my 18".



*Hickson 16 - DSS Image*

Finally, if you've got a larger scope and are looking for a challenge object this evening, might I suggest Hickson 16? This is a fairly group of galaxies near NGC 835. The group consists of four components:

- A - NGC 835 (mag 12.1, size 1.3'x1')
- B - NGC 833 (mag 12.7, size 1.5'x.7')
- C - NGC 838 (mag 13.0, size 1.1'x.09')
- D - NGC 839 (mag 13.1, size 1.4'x.7')

And with that, that's it for this month. Once again, thanks to the readers who submitted observations, sketches and photos. Your contributions greatly enrich these articles. And if you're wondering where Sculptor is - don't worry, it will be along next.

As always, I'm gratified if folks find my meanderings useful.

Till next time -

-Tom T.

## **Additional Resources / References / Just Plain Cool Stuff**

### **HST Reveals the Central Region of an Active Galaxy**

<http://hubblesite.org/newscenter/archive/releases/1994/07/image/a/>

### **Gemini Images a Shocking Skull of Gas**

<http://www.gemini.edu/node/181>

### **The Sculptor Group**

<http://www.atlasoftheuniverse.com/galgrps/scl.html>

### **Adventures in Deep Space: Hickson 16 in Cetus**

<http://www.astronomy-mall.com/Adventures.In.Deep.Space/h16ch.htm>

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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](mailto:tomt@cloudynights.com)

(Please contact me via Forum PM if I don't respond.

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

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<http://www.stellarium.org>

*Special Thanks to Olivier Biot for assistance with the PDF's and all those who take the time to read and contribute to this series.*