



## Cetus a Monster Whale

by Magda Streicher  
*magdalena@mweb.co.za*

The Cetus constellation is situated in the northern part of sky and ranked as the 4<sup>th</sup> largest among the documented 88. Cetus in mythology represents the sea monster sent to kill the princess Andromeda, but legends also point a finger of concern to Draco, another northern hemisphere constellation. The constellation occupies a part of sky that houses mainly galaxies and, sadly, few known clusters or nebulae; but it is famously situated at the south pole of the Milky Way.

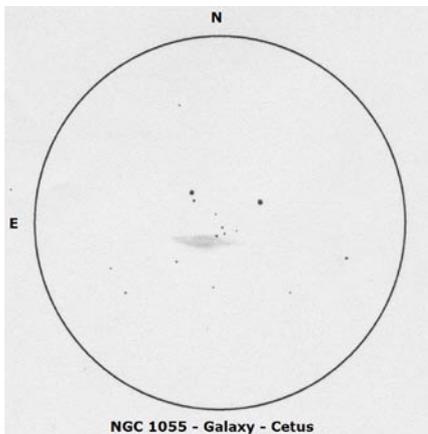
About 5° from the Taurus border in the north-eastern corner of Cetus, magnitude 2.5 alpha Ceti (also known as Menkar) appears to be the watchful eye of the whale. The lovely red-orange giant star can be appreciated through binoculars as a double star with a magnitude 5.6 visible partner, but it is not a physical companion of alpha Ceti.

The magnitude 4 delta Ceti star points the way barely 35' east to **NGC 1055**, one of the most outstanding objects to be found in this constellation. The galaxy displays a soft elongated east-west oval with the middle part slowly brightening to an intense glow. With averted vision the eastern part displays a fade-out tip. The western

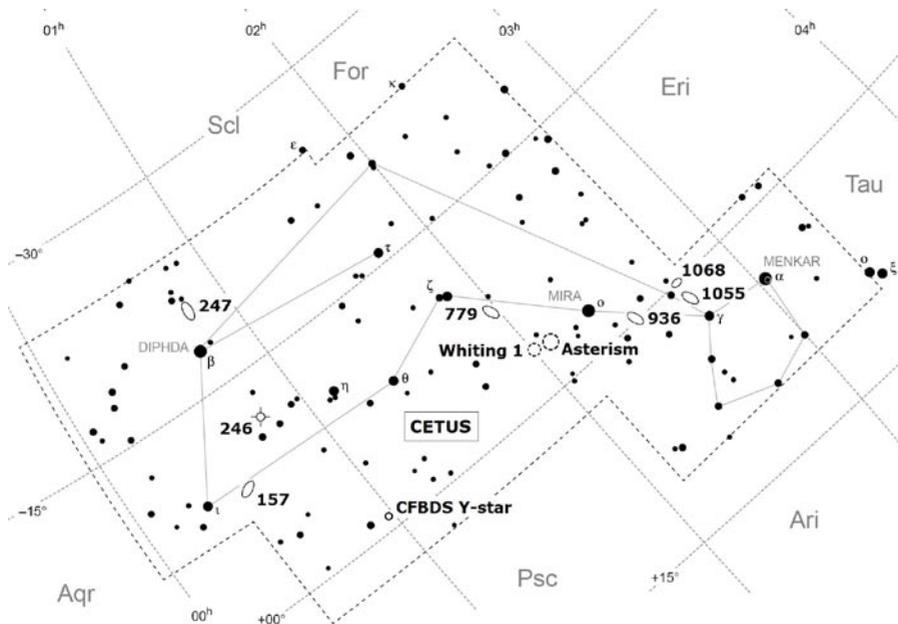


Image source: Stellarium.org

section again is somewhat slimmer, a fraction longer with a defined tip and a small triangle of magnitudes 12 to 13 stars close by (see sketch). With higher magnification the dusty dark lane nearly touches the northern edge of the galaxy. This star city forms a nice triangle a few arc-minutes to the south of two similar stars, a slightly yellow magnitude 6.7 and a plain cream-white magnitude 7.5 which also pairs with a magnitude 10 star to its south. It is a very exceptional star field that rounds off this showpiece galaxy in a very distinctive way.



## cetus a monster whale



Another galaxy, quite different in shape and impression, is the well-known **NGC 1068** (Messier 77), half a degree south from NGC 1055, and the only Messier object in the constellation Cetus. NGC 1068 is a peculiar Seyfert galaxy displaying a misty appearance with an irregular shape and a very bright star-like nucleus. With a mottled brightness of about magnitude 8.2 one gets the impression of a faint globular cluster rather than a galaxy. Higher magnification, however, reveals soft, barely visible, wisps of nebulosity around the edge. The galaxy is just west of a magnitude 9 foreground star gives the impression of two wide open eyes in the dark of night. Even the stars in the field play the game in pairs, which is quite pleasing. This Seyfert system, which exhibits unusually intense and variable ultraviolet emissions

from a tiny star-like nucleus is probably the sign of gas spinning into a super-massive black hole. It was also one of the first galaxies found to have a large red shift, thus implying that it was receding rapidly along our line of vision. The spiral structure in NGC 1068 (M77) was first noted by the Earl of Rosse.

To the east, forming a triangle with the above two galaxies, is NGC 1072, a very faint north-south spindle which is a real challenge to search out.

An easy way to find objects is to look out for triangles among the stars. **NGC 936** is situated west in a long, thin triangle with the stars delta and omicron Ceti. The galaxy appears to be just a faint, roundish glow lying south of a group of four stars.

## deep-sky delights

Higher magnification offers no improvement of the view with any sign of the fainter companion galaxies either. The area is packed with galaxies, but if you want to search for them you will need really high magnification, a very dark, transparent sky and a lot of patience.

The collar on the mighty whale's neck indicates the famous magnitude 6.5 red giant star **omiron Ceti**, better known as Mira, which means "the wonderful", a name bestowed on it in 1662 by Johannes Hevelius (1611–1687). The star undergoes actual pulsations in size and brightness and varies from as dim as magnitude 9 to as bright as magnitude 3–4 and even as high as magnitude 2. The Greek astronomer Hipparchus became the first person to spot the star's light, but recognition as a variable star was credited to David Fabricius (1564–1617), who spotted it rising in 1596 and again in 1609. The cycle is now estimated to be 11 months or close to the value of 332 days. In 2007 astronomers imaged Mira's ultraviolet smoke trail of about 2° long left behind in its 30 000 years of travel through space. Mira, known as a Mira-type star, appeared in Johann Bayer's

17<sup>th</sup> – century catalogue, where it was assigned the Greek letter omicron. A magnitude 12 companion star can be found in a PA of 90. Another lovely red magnitude 9 star can be seen north-east of Mira, which lends a special effect. However the system was previously identified as multiple in the *Hipparcos Input Catalogue*. The astronomer William Herschel refers to Mira as a star with a deep garnet colour.

Mira's comet-like tail stretches a startling 13 light-years across the sky (see picture). Mira's tail also tells a tale of its history – the material making it up has been slowly blown off over time, with the oldest material at the end of the tail having been released about 30 000 years ago.

Globular clusters are concentrated old stellar groups that can be found in the outer Milky Way disc. **Whiting 1** was found on a survey done by Alan Whiting (Cerro Tololo Inter-American Observatory) in 2002 that identified it as a compact cluster of blue stars which he believes could possibly be a very young globular cluster due to an abundance of low metals. The object was later classified as an open cluster only



Mira appears as a small white dot in the bulb-shaped structure at right, and is moving from left to right in this view. The shed material can be seen in light blue. The dots in the picture are stars and distant galaxies. The large blue dot at left is a star that is closer to us than Mira.



NGC 246. Picture credit, Dieter Willasch

about 5 billion years old (see picture). This object is situated  $4^\circ$  west of Mira, but do not expect to make an observation of this very faint and illusive object.

Barely a degree to the south a grouping of seven relatively bright stars forming a sort of triangle impression pointing south-west. The name "the pointing seven" crossed my mind the moment I laid eyes on this **asterism**, which is best seen in low magnification with a wide-field eyepiece.

A further two degrees south, more or less in the middle part of the constellation, is **NGC 779**, a relatively bright, quite large, thin ray of light in an elongated north-south direction, with a bright stellar nucleus. Again you need very dark, transparent skies and relatively high magnification to spot this galaxy, as is the case, sadly, with most of this category objects.

Quite outstanding are the three stars eta, iota and beta Ceti, which form the tail part of the graceful, mighty whale, which can

be easily identified in the south-western part of the constellation. Situated in the middle area of the indicated triangle is a very exceptional planetary nebula which truly creates an unusual impression. **NGC 246** is well known as one of Cetus's special jewels, and is indeed out of the ordinary. The planetary nebula displays a soft, round-dish smoke ring that engulfs five foreground stars, with the hot central star very obvious (see picture). Filters will bring out a knotty structure on the planetary surface, which sometimes refer to in the appearance of a human skull. If you want only one object that is worth a visit then you need not look any further. The very faint galaxy NGC 255 is situated only  $30'$  to the north.

Another special Cetus galaxy **NGC 247** can be found 2 degrees south of the magnitude 2 beta Ceti also known by the name Diphda. The spindle in a north-south direction is quite outstanding against the background star field with a relatively bright nucleus (see picture). With careful observation and higher magnification distinct markings and perhaps a few star points can be spotted on the dusty surface.



NGC 247 Picture credit, Dieter Willasch

NGC 247 belongs to the Sculptor Group of Galaxies and is about 7 million light-years distant.

The galaxy **NGC 157** is situated virtually on the western tip of the whale's fin just slightly north-east of the star magnitude 3.5 iota Ceti. The galaxy lies in a north-east to south-west direction and displays a quite prominent nucleus covered in haziness. With larger backyard telescopes

and really high magnification it is possible to spot perhaps a few markings on the surface if you are fortunate to have transparent dark skies.

The Canada-France Brown Dwarf Survey (CFBDS) has found the coolest brown dwarf yet, not even 350° Celsius – cool enough to show ammonia in its spectrum (*Sky and Telescope*, August 2008). This star, known as **CFBDS J005910.90-011401.3**, has now been put into a new proposed spectral class of Type Y stars and is situated about 40 light-years away in the Cetus. The special star is situated in the far north-west of the constellation, a degree north-east of the galaxy NGC 307, but spare yourself the effort of looking for it.

Why not swim with the monster whale and discover some of the special objects sharing the waves in the seas of Cetus! ☆

Object	Type	RA (J2000.0)	Dec	Mag.	Size
NGC 157	Galaxy	00 <sup>h</sup> 34 <sup>m</sup> 8	-08°24'	10.4	4.1'x2.4'
NGC 246	Planetary Nebula	00 47 0	-11 53	8	225"
NGC 247	Galaxy	00 47 1	-20 46	9	19'x5.5'
CFBDS	Type Y				
J005910.90-011401.3	Brown Dwarf	00 59 1	-01 14	-	*
NGC 779	Galaxy	01 59 7	-05 58	11.2	3.4'x1.2'
Whiting 1	Cluster	02 02 9	-03 15	-	-
Star Group	Asterism	02 04 8	-04 16	7.2	40'
Omiron Ceti	Mira-type Star	02 19 3	-02 59	9-2	*
NGC 936	Galaxy	02 27 6	-01 09	10.2	5.7'x4.6'
NGC 1055	Galaxy	02 41 8	+00 26	10.6	7.3'x3.3'
NGC 1068 (M 77)	Galaxy	02 42 7	-00 01	8.9	8.2'x7.3'