Night Sky: Cygnus

By: Michael McCulloch

The constellation Cygnus was called the "Bird of the Forest" by the Babylonians, "The Hen" by the Arabs, "The Bird" by the Greeks, and "The Swan" by the Romans. The most enduring legend is derived from the story of Zeus and Leda, daughter of Thestius, King of Aetolia (located in central Greece). The legend is that Zeus was taken by Leda and disguised himself as a beautiful swan in order to seduce her. From this union was born Helen of Troy and Pollux.

In addition, the "Northern Cross" has obvious meaning in the Christian tradition and was recognized by the early Christians. In modern times, Cygnus sinking low in the west in the early evening signals the onset of Christmas and the end of the year.

OPEN CLUSTERS

Spotlight on: M39, NGC 6811, NGC 6871, NGC 6885, NGC 6910, M29, NGC 6940, and NGC 7243.

Honorable mentions: NGC 6819, NGC 6866, NGC 7063, and The Coathanger (Cr 399; Brocchi's Cluster).

See the attached Open Clusters chart for exact location of each cluster.

M39

Photo by H. Mikuz, B. Dintinjana and T. Zwitter

M39 is very easy to locate, consisting of a grouping of bright, blue stars, and is a nice binocular object. If Cygnus is rising in the east, simply point to Deneb and sweep down toward the horizon and slightly north. M39 will pop into view. M39 is also a nice object in scopes at low power with a wide FOV.

NGC 6811

NGC 6811 is a nice cluster located just north of the westmost star in the crossbar. The cluster is a good object in all scopes, with medium aperture scopes displaying a donut hole in the tight grouping of stars. Thus, the cluster is often termed the “hole cluster”.

NGC 6871

NGC 6871 is located near the center of the cross and is a very nice target in medium and larger aperture scopes. The cluster contains 15 stars mag. 6.8 and fainter over a 20' field in a very rich section of Milky Way. The group consists of several bright stars of slightly different color. Two bright pairs of stars dominate the cluster.

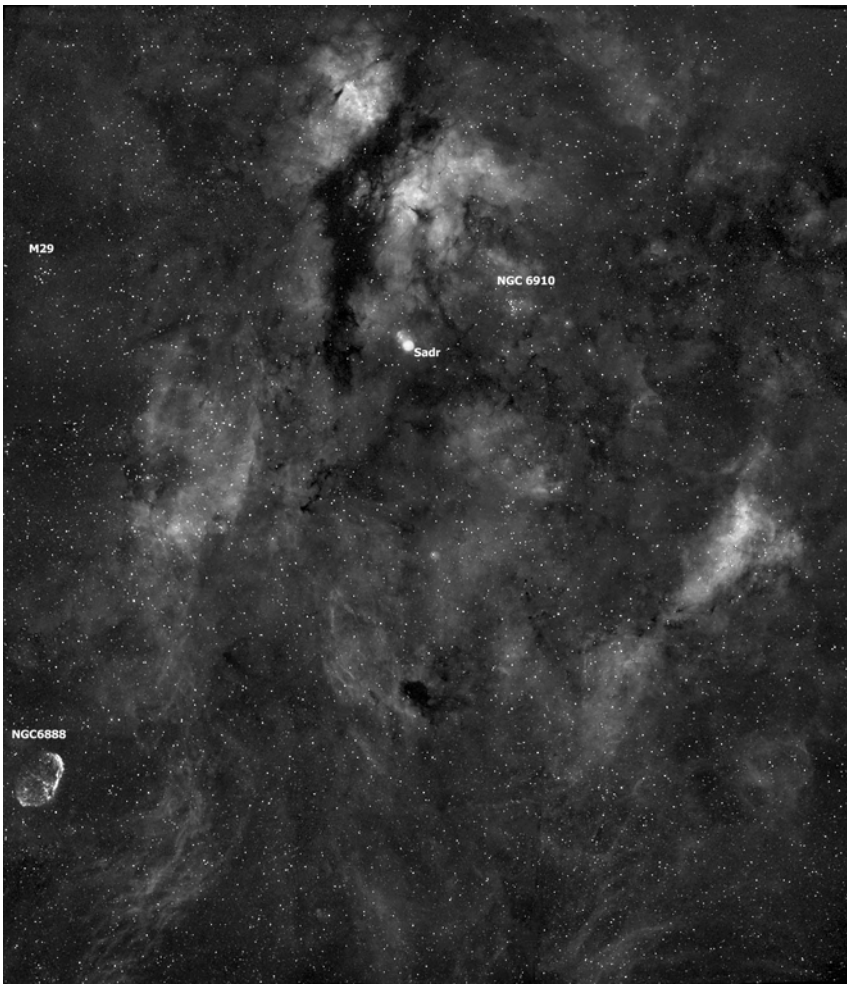
NGC 6885/2

NGC 6885 is actually located in Vulpecula and is a cluster of 30 stars mag. 6 and fainter, and embedded in a rich area of the Milky Way. It is described as very bright (mag. 5.7), very large (7'), and somewhat irregular in shape. The photograph above shows both 6885 and its much larger and fainter companion, 6882. Both together make a fine target for any scope.

NGC 6910 and M29

These two clusters are located near γ Cygni (Sadr), the center star of the cross. The γ Cygni region is very rich in star clouds and nebula. NGC 6910, shown in the photo below, is often called the "Y cluster" as the brightest stars in the cluster form the shape of the letter Y. The cluster shines in medium and larger aperture scopes with moderate magnification.

M29 is a rather mundane Messier object. It is a sparse cluster of brighter stars and is a good binocular object.



Note NGC 6888 (Crescent Nebula) at the lower left of the γ Cygni region (photo by Ray Gralak).

NGC 6940

NGC 6940 is also located in Vulpecula and appears most impressive in a very wide FOV scope. The wide FOV best displays the change in density from the surrounding stars. The cluster is very rich with a faint dusting of stars.

NGC 7243

Photo by Observatorium Hoher

NGC 7243, located in Lacerta, is a bright and colorful grouping of stars that is nice in all scopes. It contains about 40 stars spread over a 27' area.

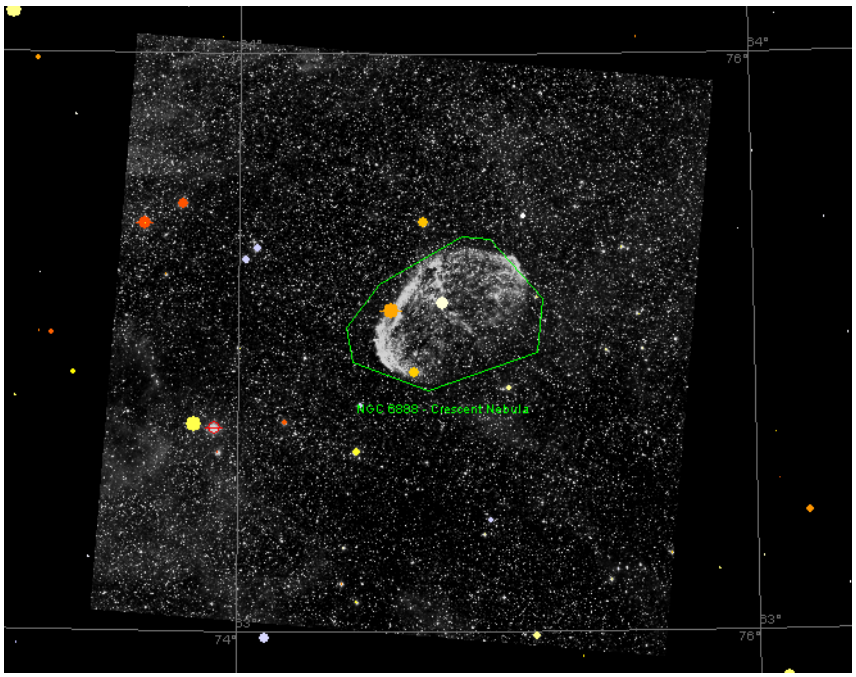
NEBULAE

Spotlight on: NGC 6888, NGCs 6992/5 and 6960, NGC 6826, NGC 7000, and M27. See the attached Nebulae chart for exact locations.

NGC 6888 (Crescent Nebula)

Photo by R.D. Crisp

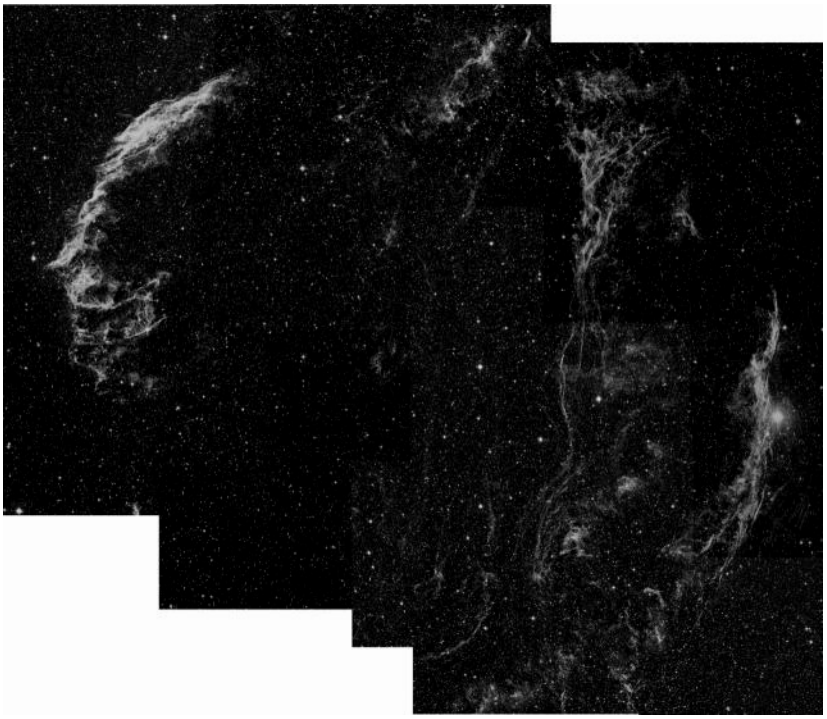
A rather recent discovery for myself, the Crescent Nebula has become a favorite object. It is visible under dark skies with a UHC or OIII filter with an 8-inch or larger scope. A triangle of bright stars marks the brightest end of the nebula which appears as a crescent in small scopes. Bigger scopes show the nebula as shaped like the number 6 with hints of the internal structure shown in the photos.



The Crescent Nebula is the product of mass ejection from a Wolf-Rayet star. The actual Wolf-Rayet star is visible as the rightmost yellow star of the triangle of stars enclosed in the nebula as shown in the diagram above (from SkyMap Pro 9 with a DSS plate displayed). The star is SAO 69592 (HD 192163) and it is magnitude 7.6.

Wolf-Rayet stars are massive stars (20+ times the mass of our Sun) and are believed to be one of the last stages of massive star evolution before the supernova state. However, the theory has yet to be verified as no known Wolf-Rayet star has yet been directly observed to go supernova.[1]

NGC 6992/5 and NGC 6960 (Veil Nebula)



The entire Veil Nebula; left portion of the image is the Eastern section of the Veil; right portion around the bright star 52 Cygni is often called the "Witch's Broom".

The Veil Nebula is truly a showpiece object and is visible with a UHC or OIII filter in almost any scope under dark skies, with the eastern side being brighter and easiest to view. In a ST refractor with a widefield EP, the entire nebula as shown above can be viewed. Larger aperture scopes show detailed filament structure in the Eastern region and the in the area around 52 Cygni.

The Veil Nebula, about 1,600 light years away, is a supernova remnant -- an expanding shell of gas and dust expelled by an exploding star. The source star is estimated to have exploded some 15 to 30 thousand years ago (various sources quote widely-varying ages).

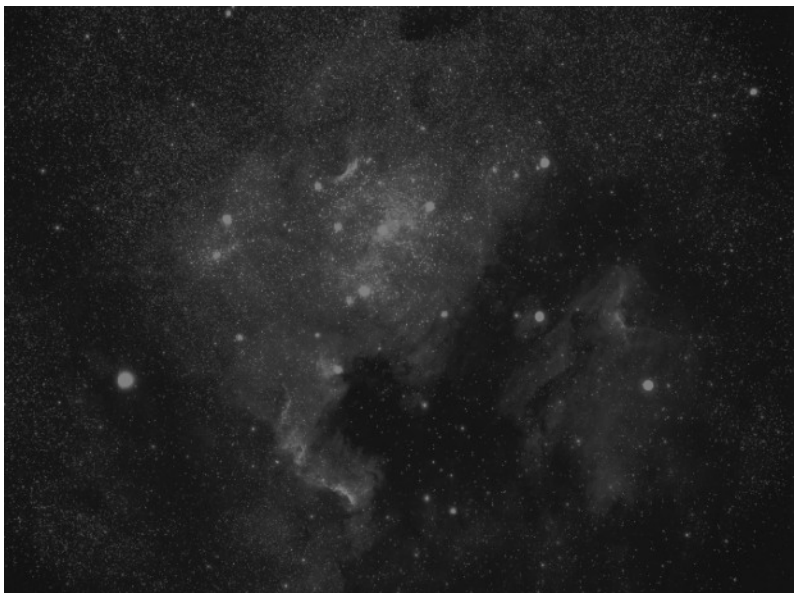
1. See http://www.peripatus.gen.nz/Astronomy/WolRaySta.html.

NGC 6826 (Blinking Planetary)

NGC 6826 is not a visually impressive object in amateur scopes (the photo above is from the Hubble!) since it is of such small size (25"). It is a curious object in 8-inch and larger scopes at medium to high-magnification. When viewed with direction vision the nebula disappears. When slightly averting your vision, the nebula pops right back into view. The effect can be quite pronounced.

NGC 7000 (North America Nebula)

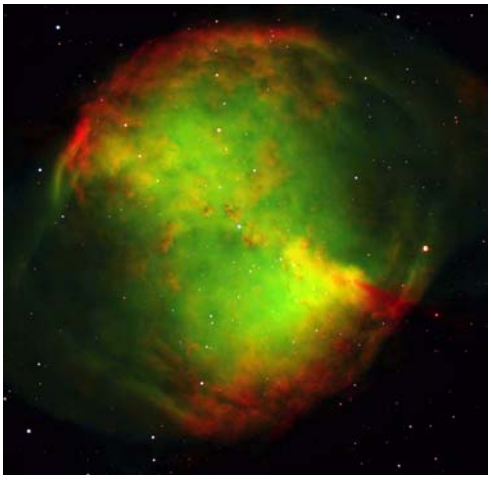
The North America Nebula is a huge object. Don’t expect to observe it in anything with less than a 3- to 4-degree FOV. However, in a wide-field with a UHC filter, the object can be seen in its entirety. The image below is a realistic representation of how the object appears in my 100mm f/6 achromatic refractor with a 30mm Widescan III EP (~ 4 deg FOV) and a UHC filter.



With dark skies and good transparency, the North America nebula can be glimpsed with the naked eye. Binoculars can also enhance the view, however in my opinion a UHC-class nebula filter yields the most satisfying view.

According to Burnham's, Deneb is believed to be the primary illumination source for the North America nebula. The nebula is estimated to be 1,600 light years distant, with a true separation from Deneb of about 70 light years. The span of the nebula is about 45 light years.

M27 (Dumbbell Nebula)



An awe-inspiring Hubble photo of M27.

M27 (actually located in Vulpecula) is one of the finest deep-sky objects. It is bright and easy to view in almost any scope. Nebula filters are not required but do increase the contrast of the object.

M27 was the first planetary nebula ever discovered. On July 12, 1764, Charles Messier discovered this new and fascinating class of objects, and describes this one as an oval nebula without stars. The name "Dumb-bell" goes back to the description by John Herschel, who also compared it to a "double-headed shot."

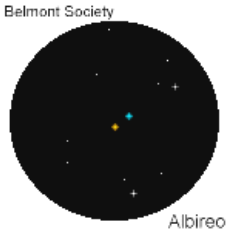
The bright portion of the nebula is apparently expanding at a rate of 6.8 arc seconds per century, leading to an estimated age of 3000 to 4000 years. The shell ejection probably would have been observable to Earth's inhabitants at that time.[1]

1. From http://seds.lpl.arizona.edu/messier/m/m027.html.

DOUBLE STARS

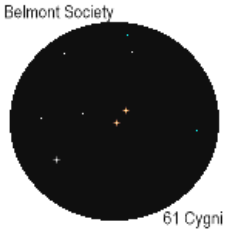
Spotlight on: Alberio, 61 Cygni, 17 Cygni, and the Double-Double ε Lyra.

See the attached Double Star chart for exact locations.[1]



Alberio (β Cygnus)

Alberio is probably the best known and one of the most colorful pairs (34" separation). The blue and gold contrast is stunning in scopes of all sizes. It is a must see for all beginning observers.

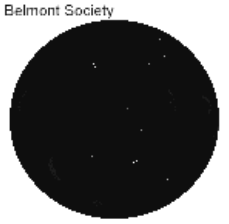


61 Cygni

A pair of bright orange stars (28" separation) that appear as "demon eyes" staring at you from deep space. 61 Cygni is a historically significant double in that it was the first parallax measurement, and therefore the first extra-solar star distance determined. The stars are the fourth closest naked-eye stars in the night sky at ~ 11 light years distance. A large planetary companion of the system on the order of 1/10th the mass of our Sun is suspected. The separation of the stars averages 84 AU and the orbital period is about 700 years.

17 Cygni

A nice pair of yellow and red stars separated by 26".

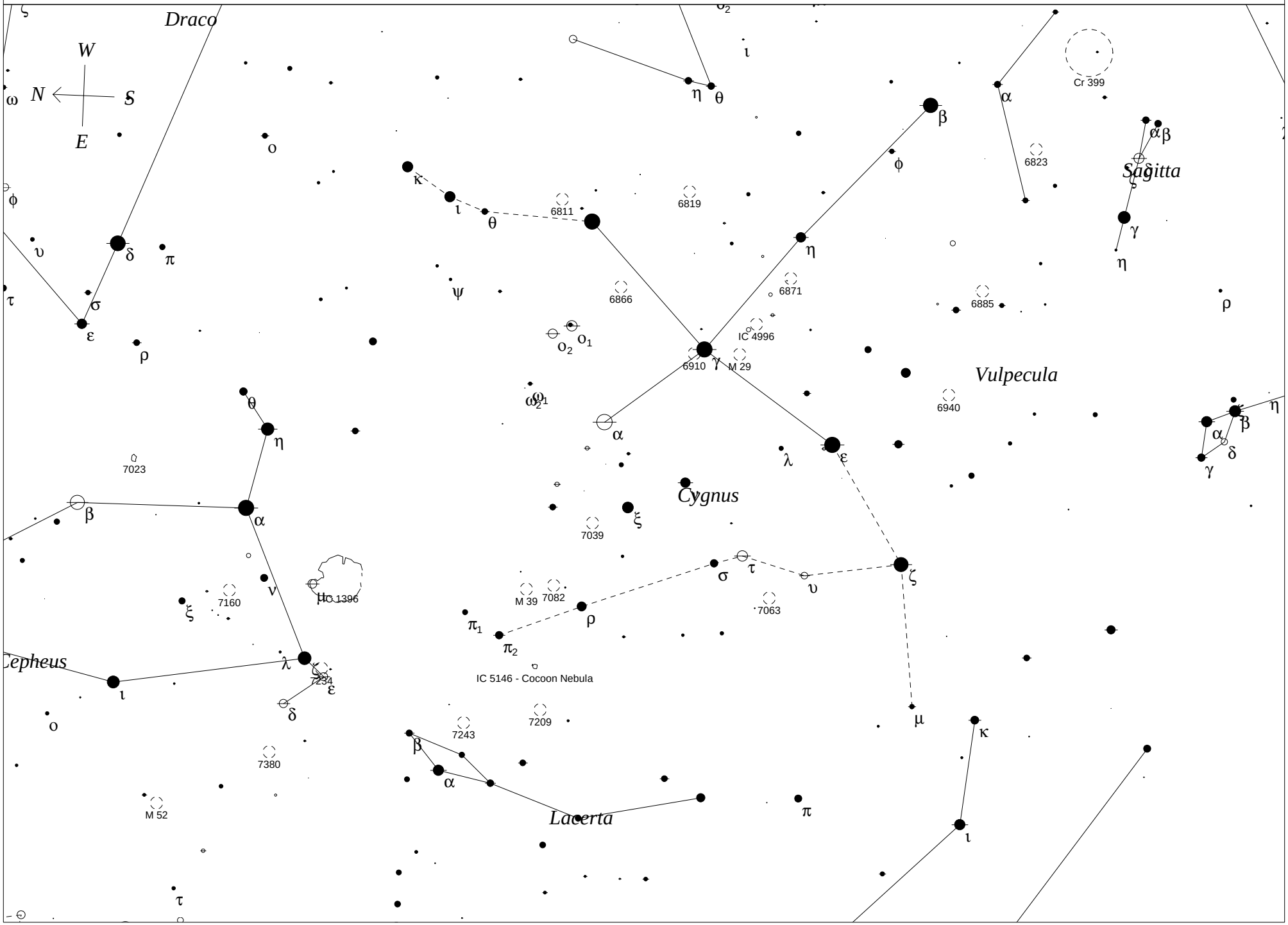


Double-Double (ε Lyra)

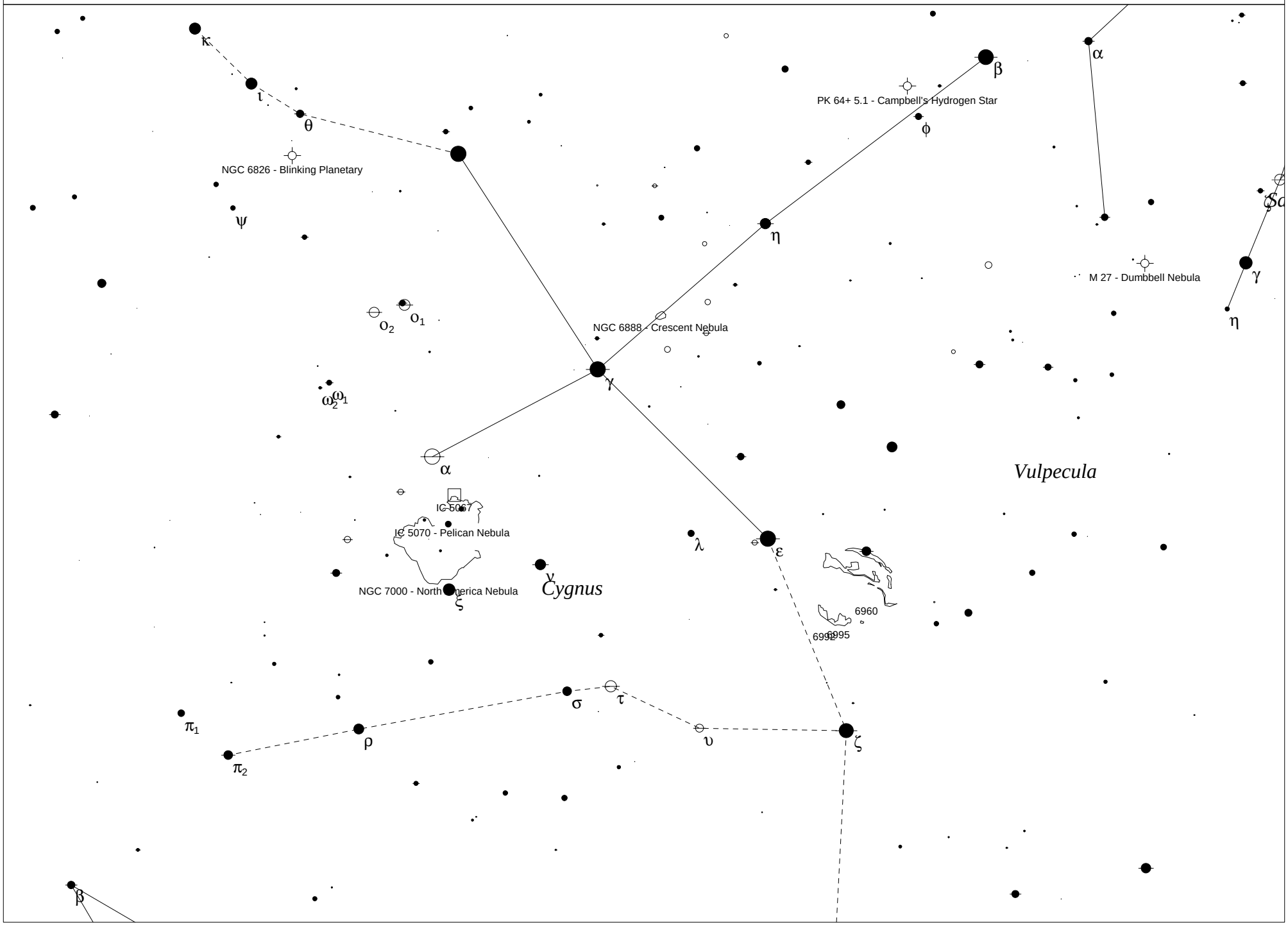
Located in Lyra, the double-double consists of two bright and closely arranged pairs of stars. It is often used by observers as a test of their collimation and seeing conditions. Good quality, well-collimated optics under good seeing should be able to split this pair at 100x.

1. Double-star diagrams from http://www.belmontnc.4dw.net/dblstr-sket.htm.

Cygnus: Open Clusters of Interest



Cygnus: Nebulae of Interest



Cygnus: Double Stars of Interest