Object of the Week Oct 12, 2014 - NGC40 The Bow Tie Nebula

NGC40 - Caldwell 2 / Cepheus

Planetary Nebula

RA: 00h 13' 01", Dec: +72 31' 19"

12,3 mag / Size: 38 x 35 arcseconds

The planetary nebula NGC40 is located one-third of the way from Gamma Cephei to Kappa Cassiopeiae in an area devoid of bright stars. To find it I use a red dot finder and the triangle set up by Gamma Cephei, Pi Cephei and NGC40. Using a moderate power eyepiece, the object can usually quickly be found.

The approximately 3500 light-years distant planetary nebula was discovered by William Herschel on November 25, 1788. The dying star has ejected its outer layer which has left behind a smaller, hot white dwarf with a surface temperature of 50000 degree C. The central star has, typical for white dwarfs, a very high density. It's mass is about 70% of the mass of our sun, the diameter is comparable to our earths one.

The central star is a late-type Wolf-Rayet star. Radiation from the star causes the outer layer to heat to about 10,000 degree C. It is about one light-year across.

The PN is estimated to be 4000 years old, the hot gas is still expanding. About 30,000 years from now, scientists theorize that NGC 40 will fade away, leaving only the white dwarf star.

The following picture is from Johannes Schedler (Panther Observatory):

The beautiful object is an interesting aim for a wide area of apertures! Due to its relative high brightness, the PN can already be seen using small refractors.

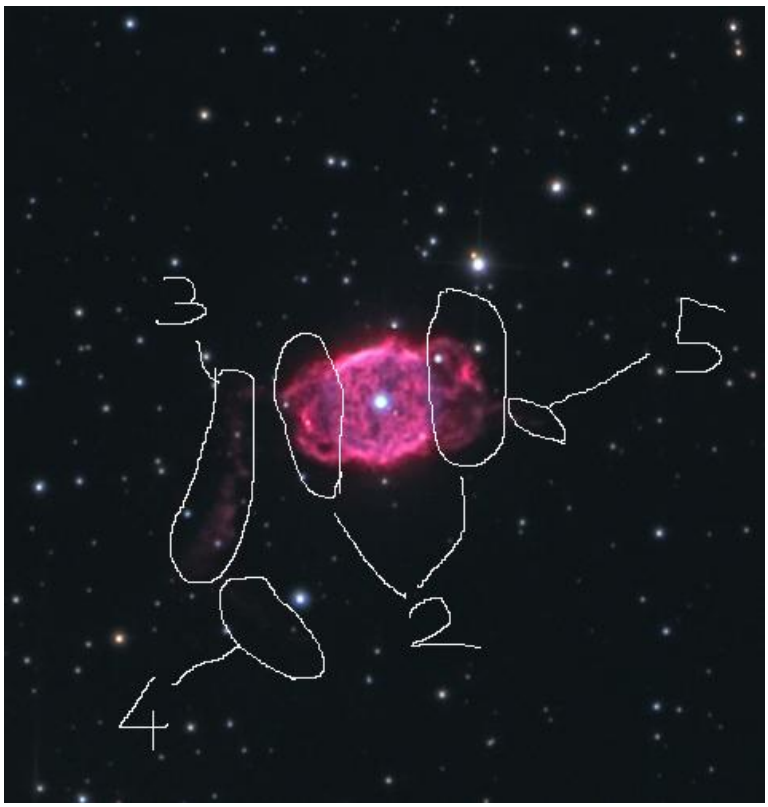
Using my 12" dobson, I was able to identify a number of details, e.g.

- the central star,
- outer shells with details (one of it split!) and
- two darker areas within the nebula itself.

NGC40 (Caldwell 2)
Observing Place: Sudelfeld, Germany
Date, Time: Nov. 16 2012, 00am
SQML = 21,45 mag/arcsec*2, rel. Hum. = 45%, 4 GradC, seeing= II
Dobson "Hofheim Instruments" 12" / f5
Power: 300x (Nagler 5mm)
used Filter: none

But this is not the end of the story.

Using larger apertures, there is far more to be discovered!



With increasing difficulty there are

- more details in the bright part of the object (such as different peaks in the outer shells or structures in the inner part)
- the complex outer areas labeled with "2"
- the filament labeled with "3" (you probably need a really big scope!!!)

The two filaments labeled with "4" and "5" are maybe outside from what is visually possible today (and maybe also tomorrow and the day after tomorrow ...).

However, as outlined above the object is a grateful aim for all apertures and I would be interested in your experiences with it.

"Give it a go and let us know"