

NGC 7008 – a ‘celestial hook’

One of the delights of the summer sky for planetary nebula enthusiasts is the number of objects on view. And for visual observers who don't have the luxury of remote warm-room observing, all available under a pleasant summer sky. Even the lack of truly dark skies is not a serious problem as many planetaries have a high surface brightness and the use of filters can often improve contrast. To many people summer planetaries mean the Ring Nebula or the Dumbbell, but there are numerous other objects which deserve investigation, and one of them is NGC 7008 in Cygnus.

Discovered by William Herschel in 1787, he classified it as a bright nebula rather than a planetary which, considering its shape, was reasonable. To Herschel planetary nebulae were small round objects which often appeared slightly greenish and which reminded him of Uranus, which he had discovered 6 years earlier. The true nature of what we now call planetary nebulae remained a mystery until William Huggins turned his spectroscope on NGC 6543 in 1864 and realised it was a gaseous object. NGC 7008 lies in Cygnus, close to the Cepheus border, at RA

21h 00m 33s and Dec +54° 32' 35" (2000.0), almost midway between a line joining mag 1.3 Deneb (α Cygni) and mag 2.4 Alderamin (α Cephei). As with many planetaries its stated magnitude varies widely in the literature and ranges from around 9 to 12, but with a size of only 1.4×1.1 arcmin it appears quite bright and will certainly be visible in a 20cm telescope. It is

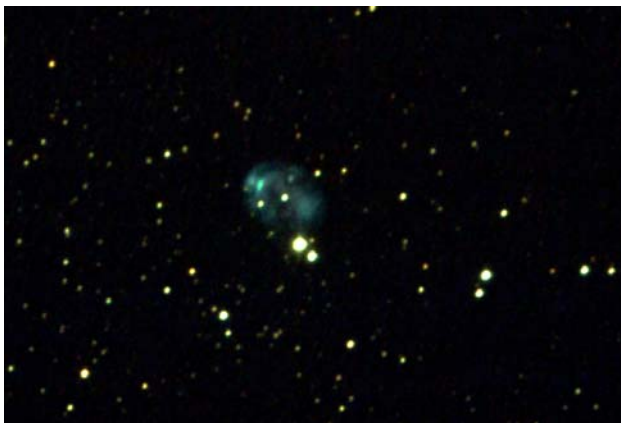
thought to lie at a distance of around 3,000 light years, with a physical size of around 1 light year.

At first appearance NGC 7008 seems a strange object. It has a hooked shape, with the hook lying north–south, and a double star (h1606, separation 18 arcsec) at its southern end. Imagers intent on capturing detail in the nebula often cause the brighter component of this double star to become bloated, so that it appears to be attached



Andrea Tasselli

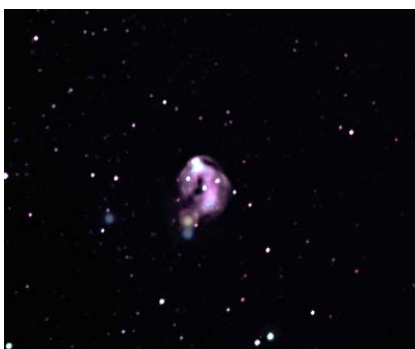
to the nebula enhancing the hook like effect, whereas visually at high power it is clearly separate. High power will also show a variation in intensity across the nebula and what were once thought to be superimposed faint stars are now thought to be knots of material associated with the planetary itself. The mag 13 central star is offset and lies slightly to the west of centre. Spectrographic investigations suggest that



Martin Morgan-Taylor

the nebula consists of two elongated shells of expanding gas, one inside the other, with the inner shell expanding faster than the outer and causing a 'snow plough' effect familiar in planetary nebulae as the inner shell piles in to the outer.

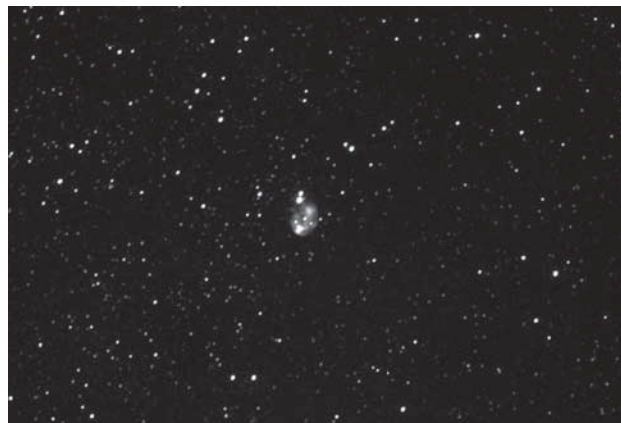
A selection of images of NGC 7008 received by the Section are included with this article (depending upon the optical train in the individual telescopes some images are flipped compared to others).



Fred Stevenson

field image (field size 38x28 arcmin) was obtained with a TMB 115mm f/7 refractor and SXV-HD CCD camera. The exposure was 10min through an OIII filter. Even at this scale the nebula displays a clear shape. Martin Taylor's image was taken through his 20cm Cape Newise using a Canon 20D SLR camera. The stacked exposure of 8x4min gives a close approximation to how the nebula appears visually. Fred Stevenson's image was from a much longer exposure, including an H-alpha component. Taken through his 35cm Meade SCT with a DSI Pro III CCD camera the details were 10x4min H α , 10x4min Red, 7x4min Green and 13x4min Blue. Andrea Tasselli is one of the leading exponents in the country of imaging planetary nebulae and his image on the previous page through an Intes Micro M809 (20cm f/10 Mak-Cass) with SXV-H9 CCD shows tremendous detail. The LRGB image consisted of 75min Luminance and 21 min each RGB through Astronomik IIc RGB filters.

Visually in a large telescope (say 30–35cm) and at high power (x200) this planetary shows



Nick Hewitt

marvellous detail, appearing around 90 arcmin in size with a brighter area to the north-east end of the hook and a smaller bright area at the southern tip. Careful study will show an interesting textured surface which is much more obvious with an OIII filter, and a darker band which appears to cut the nebula in two. A UHC filter is of minimal use on this object, the view being only marginally better than with no filter at all.

Stewart L. Moore, *Director, Deep Sky Section*



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