

Data of the sky region at the time of the observation	SQM-L 21.15 IR -15° Temperature 15°
Data of the night	Sun alt: -48.3° Moon alt: -38.8°
Data of the object	Alt: 54.4° Az: 9.0°
Telescope	Stargate 18"



Nagler 31mm (70x - 1° 10' - 6.6mm)

Very easy to locate with a very nice star field. There are several stars, but some of them stand out for their brightness, which are also very close to the planetary nebula. In particular, the two golden, orange-colored stars that form an obtuse angle with the planetary nebula. Both stars are at a similar distance from the nebula, the slightly more luminous one (mag 9.07) is located at 1 o'clock from the nebula, while the companion (9.63) is at 9 o'clock. Also striking is another star very close to the nebula, at its 7 o'clock, of mag 12.95.

The nebula is quite large for a planetary nebula, since even at these magnifications I am able to see the outer halo clearly with direct vision and the central star that has formed the nebula. As often happens to me, it seems that between the nebula and the central star there is an area of less brightness.

Its shape is spherical although sometimes it seems to me that its shape is rather oval with the major axis being that of 3 to 9. But if it is, at least at these magnifications, it would be with a very close ratio, perhaps 1:1.1, that is, with an axis only 10% longer. In addition, this *deformation* of the nebula's sphericity is shown as some protrusions of the nebula, of lower brightness than the edge of the nebula.

NGC 40 is very bright, and as I have already mentioned, it does not require averted vision to observe it. It is clearly seen with direct vision.

Even with this eyepiece I start to see some details in the nebula. For example, the edge is very defined, and the interior of the nebula shows a granular structure, i.e., there is not a uniform brightness but it seems that there are many parts with different levels of brightness but not clearly defined.

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Nagler 22mm (98x - 50' - 4.7mm)

The 22mm eyepiece with this telescope always gives superb results. Now the nebula appears much larger while maintaining all its brightness. I forgot to mention that I do not see any color in the nebula, that is to say that I see it totally gray, very beautiful, but without tonality.

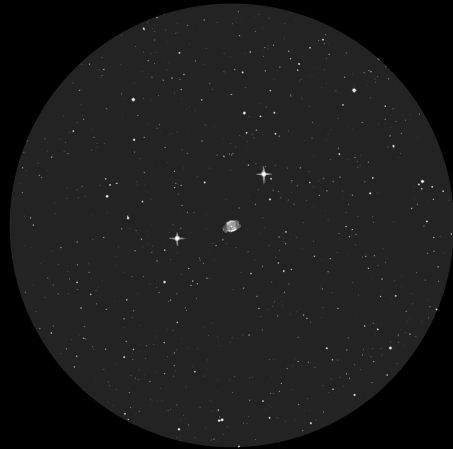
It is very surprising the internal structure of the nebula, with a kind of network of threads that go from the edge of the nebula to the central star, and are seen with direct vision. However, this very complex structure does not present any pattern, but is simply a network of threads, chaotic without being able to refer to anything else.

The edge of the nebula, although defined, does not seem to me to have any thickness, but simply determines the end of the nebula.

A very beautiful image as even the nebula, though large for a planetary nebula is small in such a wide field.

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How the image has changed with the 14mm!



I begin to perceive clearly which are the most significant structures of the nebula. First the outer rim. It is clear that in the 9 o'clock and 3 o'clock regions this rim is blurred by the effect of those protrusions that I mentioned before and make the nebula not totally spherical but oval. In addition, these protrusions emerge symmetrically in the two regions, more or less at 10 and 8 o'clock (and in the symmetrical region at 2 and 4 o'clock), the edge of the nebula ceases to be so defined and the bulge begins. That is, each bulge would occupy about 60° of the 360° circumference. The size of the two protrusions is equally similar and I do not see any difference, being, more or less, of the same size of the minor axis. Therefore, the nebula would have a 1:2 ratio, because of these protrusions. It is also important to note that these protrusions decrease rapidly in width, I would say that its slope is greater than 45°, so it ends quite sharply.

Following the description of the outer rim, it is clear that it shows two different brightness levels, in the 12 o'clock region and in the 6 o'clock region. Being, without a doubt, brighter in the 6 o'clock region, next to a star that is located at 7 o'clock, than in the 12 o'clock region. But even without taking into account this increase in brightness, the outer rim shows a ring shape (except at the ends as already explained) around the nebula; it is, therefore, brighter the rim than the interior of the nebula.

Delos 14mm (154x - 28' - 3mm)

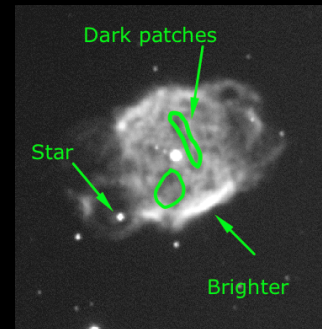
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Ethos 10mm (216x - 27' - 2.1mm)

Undoubtedly the best image I have obtained so far of the nebula.

I continue to see new details in the nebula. For example, the bulges are not the same, or at least now they don't look the same to me. The one at 3 o'clock seems to me less defined than the one at 9 o'clock, showing a difference in brightness between the two, subtle, but there it is. Using the averted vision I see a concentration of brightness in the bulge of the 9, in its lower area. However, after several minutes I verify that it is actually a star that is inside the arc, or bulge of the nebula.



In the interior of the nebula I see dark patches, it is very complicated to explain because they do not follow any structure, perhaps the most striking is the one at 3 o'clock of the central star that looks like a river that joins the star with the outer edge.

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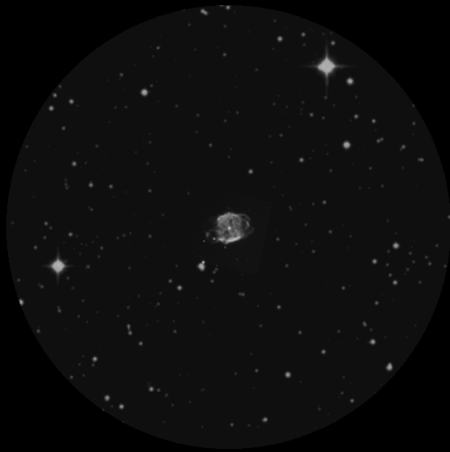
Unfortunately with this eyepiece I get no new details. I only confirm everything I have seen before. The sky has become more contrasted, and the bulges of the nebula at 9 and 3 o'clock are very difficult to see, I can only reveal them with lateral vision and after many minutes of insisting.

Nevertheless the image is beautiful as it is practically the same as before with a greater size and contrast.



Ethos 8mm (270x - 22' - 1.7mm)

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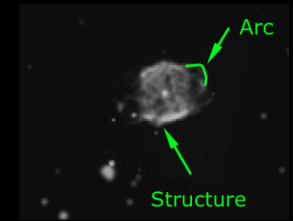
Phew, how difficult to observe the nebula with the 4.5mm! But when I manage to focus properly I get an impressive image. I confirm without a doubt that the bright area I saw in the 9 o'clock bulge is a star, as it is now visible 100% of the time as a dot.

But what impresses me most is the edge of the nebula in its brightest area, that is at 6 o'clock. It is incredible but I seem to see a kind of structure. It is clear that it is not uniform, but it is difficult for me to find any detail, perhaps that there is some kind of break, which breaks the uniformity of the ring.

It is spectacular that you can bring out such detail in such a small area of the nebula.

The other feature that leaves me hooked in the eyepiece is the arc that I see coming out of the nebula in the part of the 1 o'clock. A beautiful faint arc protruding from the nebula as if expanding into the universe. What a marvel.

Amazing what magnification can do in a planetary nebula.



Delos 4.5mm (480x - 9' - 1mm)