

Reflector

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Spectroscopy for the Amateur Astronomer

An Antenna With an Historical Past

The Open Cluster Observing Program

A New Three-Part Series: Discovering Astronomy

In the last *Reflector*, Bob Scott introduced a new Astronomical League observing program called “Two in the View.” Coincidentally, my Deep-Sky Objects article in that issue covered one of the 109 pairs on this new observing list: M35 and NGC 2158. This month, I will intentionally cover another Two in the View pair: M97 and M108. This pair is not on the official Two in the View list. However, the rules of the list allow for 15 viewer-specified pairs under any of five categories. M97 (NGC 3587) and M108 (NGC 3556) fall under the category of two NGC objects, and these are two I would recommend that anyone working on this list observe.

M97 and M108 are located just below the cup of the Big Dipper, near the star Merak. Specifically, M97 is approximately two-and-a-quarter degrees southeast of Merak. M108 is located 48 arcminutes north-northwest of M97. Therefore, any telescope–eyepiece combination with a one-degree field of view simultaneously captures both of these Messier objects. I have spied them in the same field of view using a 102 mm f/7.9 Apo with a 12 mm TeleVue Nagler eyepiece, a 6-inch f/4 Newtonian using a 15 mm Plössl eyepiece, and a 14-inch f/6 Dobsonian using a 26 mm TeleVue Nagler eyepiece!

M97, also known as the Owl Nebula, is a splendid planetary nebula. The French astronomer Pierre François André Méchain discovered the nebula in the year 1781. His friend Charles Messier added it to his list soon thereafter.

DEEP-SKY OBJECTS

TWO IN THE VIEW IN URSA MAJOR

By Dr. James R. Dire, Kauai Educational Association for Science & Astronomy



The nebula shines at magnitude 9.8 and is fairly round with a diameter of 3.3 arcminutes. The Anglo-Irish astronomer William Parsons (also known as Lord Rosse) viewed M97 in 1848 and thought the two dark perforations within the nebula resembled the face of an owl. M97 has been called the Owl Nebula ever since!

The accompanying image of this splendid celestial pair was taken with a Stellarvue ST-102T apochromatic refractor with a TeleVue 0.8x focal reducer/field flattener to give an effective focal ratio of 6.3. The exposure was 120 minutes using an SBIG ST-2000XCM CCD camera.

Small telescopes in the 4- to 6-inch range reveal the planetary nebula nature of M97, but do not provide much detail. The Owl Nebula is best viewed with an 8-inch or larger telescope. Under the best

observing conditions, an 8-inch scope could deliver views of the owl's eyes. However, I would recommend at least a 12- to 14-inch telescope to see variations in the grey nebulosity of the nebula.

Three stars are visible within the Owl Nebula on the accompanying image. They form an equilateral triangle around one of the eyes. The nebula's central star is the brightest of the three. Estimates of this star's magnitude range from 14 to 16. Based on how difficult this star is to see in a large Dobsonian, I'd say its magnitude is closer to 16 than 14. The other two stars are roughly one magnitude fainter.

The exact distance to M97 is not well known. Historical estimations ranged from 1,300 to 12,000 light-years. Recent calculations have narrowed its distance to somewhere between

1,700 and 2,000 light-years. There are numerous background galaxies within a half-degree of M97. On a 90-minute exposure image I took of the Owl Nebula using a 190 mm f/5.3 Maksutov–Newtonian, I counted two-dozen galaxies between magnitude 12.5 and 18.7.

M108 is a fine 10th magnitude spiral galaxy. The galaxy is nearly edge-on, making it much easier to see than a 10th magnitude face-on galaxy. M108 is 4 arcminutes long and 1.7 arcminutes wide. With a 4- to 6-inch telescope, the elongated shape of this galaxy is readily apparent. M108 is a barred spiral galaxy. However, its many dust lanes and oval shape give it the appearance of an irregular galaxy. Many of

these details are discernable in 8- to 10-inch telescopes.

Pierre Méchain discovered M108 the year after he discovered M97. Although Charles Messier was aware of it, Messier did not publish it as part of his catalog. It was added to his list in 1960 along with M109. The galaxy is located 45 million light-years away and has a mass of approximately 125 billion suns. The galaxy may have 290 globular clusters and has many active H-II regions and X-ray sources.

The contrast between a resident Milky Way planetary nebula and a distant galaxy make this celestial pair an outstanding set to study simultaneously in the same field of view. While moving to higher power eyepieces will allow only one of these objects to be seen at a time, the increased detail will be worth the effort. ☼