

Reflector

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Deep-Sky Objects

The Eagle's Best Nebula

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The constellation Aquila is one of the oldest constellations among the current 88 recognized by the International Astronomical Union. The constellation predates the Greco-Roman astronomer Ptolemy, who included it as one of the 48 constellations he described. Aquila is the Latin word for eagle.

In Greco-Roman mythology, Aquila was the eagle that held onto Zeus's (Jupiter's) thunderbolts. Aquila is also thought to represent the eagle that kidnapped the mythological Ganymede to serve as a cupbearer in Mount Olympus, the home of the Greek gods.

Aquila spans the celestial equator, from 15° north to 10° south, around 19 and 20 hours right ascension. The constellation can be seen equally well in both hemispheres in the evening from July

through October. The constellation's brightest star is yellow-white Altair. At magnitude 0.76, Altair is the 13th-brightest star in the sky and is ten times more luminous than the Sun.

Aquila also lies along the Milky Way between Cygnus and Sagittarius. Two tiny constellations, Vulpecula and Sagitta, separate Aquila from Cygnus. But it's easier to find Aquila by looking halfway between the more recognizable Cygnus and Sagittarius. Whereas Cygnus, the swan, is pictured flying towards Sagittarius, Aquila, the eagle, is depicted flying away.

Despite lying along the Milky Way, and unlike Cygnus and Sagittarius, Aquila contains no Messier objects and no bright nebulae. Even tiny Sagitta and Vulpecula have Messier objects! However, Aquila does have one very fine planetary nebula worthy of inspection by anyone with an 8-inch or larger telescope: NGC 6781.

NGC 6781 was discovered by John Herschel in 1834. He found it using an 18-inch reflector. The nebula lies 8° west and 2° south of Altair. It is also 4° north-



northwest of the third-magnitude star Delta Aquilae. I line up NGC 6781 knowing the planetary nebula, Altair, and Delta Aquilae form an isosceles triangle.

Like all planetary nebulae, NGC 6781 is a type of emission nebula consisting of an expanding shell of ionized gas ejected from a red giant star late in its life. Despite their name, planetary nebulae have nothing to do with planets. NGC 6781 is roughly 1.8 arcminutes in diameter and has an integrated magnitude of 11.4. Compare this to the planetary nebula M57, the Ring Nebula, which has a diameter of 1.3 arcminutes and is magnitude 8.8. M57 is 11 times brighter than NGC 6781. This is why M57 can be seen in a 3-inch telescope, but a larger telescope is required to see NGC 6781.

Visually, NGC 6781 is much easier to see in an 8-inch telescope than its magnitude dictates. The view is similar to M57 in a 3-inch scope at the same magnification. The nebula has a brighter outer ring with a dark interior. The 15th-magnitude central star is beyond all but the largest amateur light buckets. Like M57, no color can be seen in the nebula visually.

My image of NGC 6781 was taken with a Discovery 10-inch f/6 Newtonian with a Tele Vue Paracorr Type-2 coma corrector, yielding a 1753 mm focal length at f/6.9. The image was captured with an SBIG ST-2000XCM CCD camera with a 150-minute exposure. North is up and east to the left. The brightest star in the image, to the left of the nebula, is magnitude 11. The image captured stars fainter than magnitude 18. The camera captured the true color of the ionized gases. The bright red regions are ionized hydrogen emissions. The interior of the nebula contains faint blue emissions. Note the central star. The nebula is rounder than M57 and appears more like M97, the Owl Nebula, than M57.

While Aquila is mostly known for its myriad double stars and star clusters, NGC 6781 is a pleasing nebula to spy while panning across "The Eagle." Those with sufficient aperture will find capturing NGC 6781 a rewarding experience. ☀

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