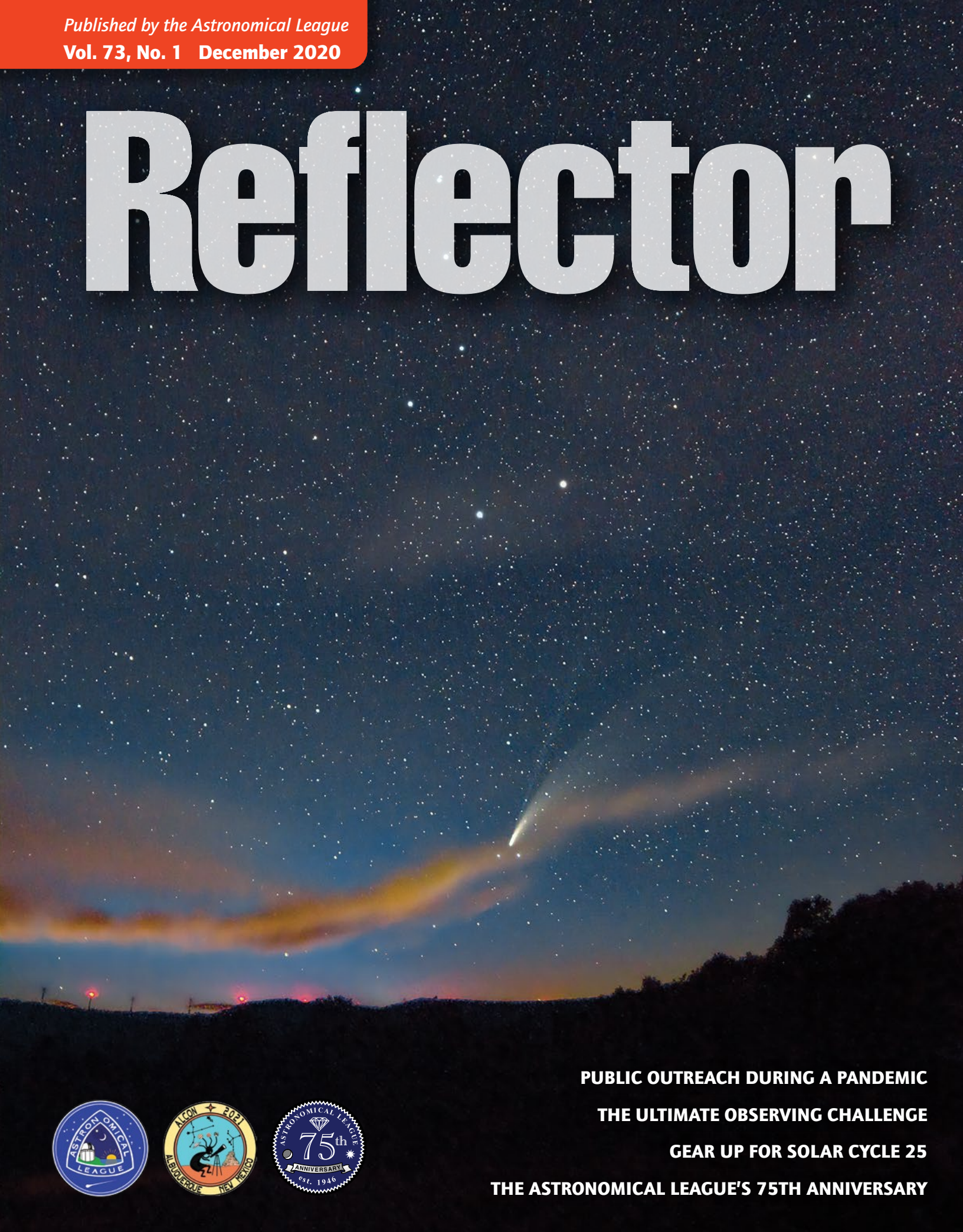
Published by the Astronomical League
Vol. 73, No. 1 December 2020

Reflector



PUBLIC OUTREACH DURING A PANDEMIC

THE ULTIMATE OBSERVING CHALLENGE

GEAR UP FOR SOLAR CYCLE 25

THE ASTRONOMICAL LEAGUE'S 75TH ANNIVERSARY

the polygonal cells where it has cooled enough to sink back toward the bottom of the basin to be reheated. Nitrogen gas escapes from the nitrogen ice surface of the basin and condenses on the mountains to eventually join the glacial flow back into the basin. Some of this nitrogen gas even escapes the mountains to form a hazy atmosphere around Pluto, a feature that Mercury lacks.

Mercury is currently static, although in its youth it was volcanically active, filling the basins like the Caloris Basin with lava that eventually cooled to form maria similar to those on our Moon. This makes Mercury look similar to the Moon. Its weak magnetic field (just one percent that of Earth) deflects some of the solar wind that would otherwise strike the surface. Pluto has no magnetic field based on New Horizons measurements.

These two small planets are similar in some ways, yet very different in others. Mercury is very hot (on the sunlit side), while Pluto is very cold. Yet both have basins and impact craters on their surfaces. They make an interesting pair of bookends for our Solar System, even if one of them is now considered a dwarf planet.

—Berton Stevens

Deep-Sky Objects

ARIES' BEST GALAXY

The constellation Aries dates back to ancient times. In mythology, Aries was the ram whose golden fleece was sought by Jason and the Argonauts.

Early Chinese astronomers saw it as a dog, while Arab astronomers depicted it as a lamb. Aries was an important constellation 2000 years ago because it contained the point where the ecliptic intersected the celestial equator. The Sun passes this point from south to north at the vernal equinox. Although precession of Earth's spin axis has moved this point into Pisces, this intersection is still called the first point of Aries.

Most astronomers would be hard-pressed to name a deep-sky object in Aries, or any stars other than Hamal and Sheratan (Alpha and Beta Arietis), the two brightest stars in the constellation. It's not because Aries is a small constellation. Among the 88 constellations, Aries ranks 41st in size. Coincidentally, it also ranks 41st in the number of naked-eye stars, that is, stars brighter than sixth magnitude. Aries just doesn't contain any bright deep sky objects. There are no Messier objects in Aries. There are 80 NGC objects in Aries, roughly one percent of that catalog. But all of them are galaxies, with only one brighter than magnitude 11.

Between 1784 and 1786, William Herschel discovered 25 galaxies in Aries brighter than magnitude 14 using his 18.7-inch Newtonian reflector. His son John discovered another five between 1828 and 1831. So, between the two of them, the family netted half of the NGC galaxies in Aries brighter than magnitude 14. The brightest of these, which William discovered, is NGC 772.

Shining at magnitude 10.3, NGC 772 is easy to find with 6- to 8-inch telescopes. To star hop to the galaxy, start at the star Sheratan (Beta Arietis), a magnitude 2.6 star near the western edge of the constellation. From Sheratan, hop one and a half degrees south to the star Mesarthim (Gamma Arietis). Slightly brighter than magnitude 4, Mesarthim is an easy naked-eye star. Hop another one and a half degrees east-southeast of Mesarthim to arrive at NGC 772. I can usually hit the location of NGC 772 with my red-dot finder and the galaxy is in the telescope's eyepiece. Both Sherartan and Mesarthim can be placed in the same field of view as NGC 772 in an 8x50 finderscope. But at magnitude 10.3, the galaxy is nearly impossible to see in the finderscope. Knowing where it is with respect to the two stars still allows its location to be centered in the finder.

NGC 772 is a mostly face-on spiral galaxy. It measures 7.2 x 4.3 arcminutes in size with the longest dimension oriented 45° from a north-south line. In an 8-inch telescope, the core of NGC 772 may appear star-like with a faint glow of the remainder of the galaxy surrounding it. Larger telescopes will begin to bring out the asymmetric shape of the galaxy as well as 13th-magnitude NGC 770, a companion galaxy to NGC 772.

My image of NGC 772 was taken with a 10-inch f/6 Newtonian with a Paracorr II coma corrector and a SBIG ST-2000XCM CCD camera. The exposure was 180 minutes. North is up and east to the left. The small elliptical galaxy south of NGC 772 is NGC 770.

Like the Milky Way, NGC 772 has a few good-sized and numerous tiny satellite galaxies. Many of them (between 16th and 18th magnitude) are visible as fuzzy dots on my image. The asymmetrical shape of NGC 772 is likely the result of gravitational interaction with the elliptical companion NGC 770, which is probably more massive than any satellite galaxy of either the Milky Way or the Andromeda Galaxy (M31). NGC 772 is about twice the size of the Milky Way, so it's not surprising that it could hold a larger satellite galaxy in orbit around it, if indeed it has NGC 770 bound in an orbit.

Detailed images of NGC 772 show curved streams of what may have once been outer spiral arms extending all the way to NGC 770 and a few other satellite galaxies. Astronomers have detected bridges of stars between our galaxy and its satellites, too. Imagine the view you would have of NGC 772 or the Milky Way if you lived on a planet circling a star in one of those intergalactic bridges!

—Dr. James R. Dire

The author's image of NGC 772