

# DEEP SKY OBJECTS

## SECOND OF A SERIES

### T'IS THE SEASON FOR STAR CLUSTERS

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The winter Milky Way paves a path from north to south from the constellation Perseus through Auriga, Taurus, Orion, Monoceros, Canis Major and beyond.

This swath across the heavens is filled with rich galactic star clusters and nebulae. Orion, due to its abundance of bright stars, is one of the most easily recognized constellations in the winter sky. Lesser known to the Hunter's east is the constellation Monoceros, whose brightest stars hover between 4<sup>th</sup> and 5<sup>th</sup> magnitudes. Positioned near the northwest corner of the Unicorn lies a grouping of stars called the Christmas Tree Cluster.

The Christmas Tree Cluster was first cataloged by astronomer William Herschel in 1784, but received its popular name from the 20<sup>th</sup> century American astronomer L.S. Cope-

land, who noticed the brighter stars in the cluster trace out the shape of its namesake. This yuletide asterism is oriented pretty much north-south with the apex pointing south. The cluster contains 80 stars, most 8<sup>th</sup> magnitude and fainter, with the "tree" spanning a quarter degree of declination.

Cataloged as NGC2264, this open-star cluster is readily visible in binoculars and finder scopes. Any telescope-eyepiece combination that our Moon fills is ideal for spying this object. Most of the brighter stars in the cluster are blue or white, but a few are yellow in color. The cluster spans 20 light years and lies 2600 light years

away. The brightest star in the constellation is called S Monocerotis (or 15 Monocerotis), which is a super-hot O-type star that varies slightly in brightness from magnitude from 4.2 to 4.6.

The Christmas Tree Cluster lies 11.5 degrees east and slightly north of Orion's bright star Betelgeuse. In the accompanying image, south is up and west to the left. S Monocerotis is the bright star at the bottom center of the image, at the base of the Christmas tree. The second brightest star in the cluster, shining at magnitude 7, forms the peak of the tree.

The cluster is embedded in a large complex of nebulosity birthing hundreds, if not thousands, of stars. The challenge for observers is to capture a glimpse of the nebula. Large light buckets, with at least 14-17 inches of glass located in dark skies under excellent atmospheric transparency, should reveal the brightest region of the nebula seen on the lower left side of the cluster in the author's image. This bright region is located 8 arcminutes southwest of S Monocerotis, near an 8<sup>th</sup> magnitude star with two close (12 and 13 magnitude) optical companions.

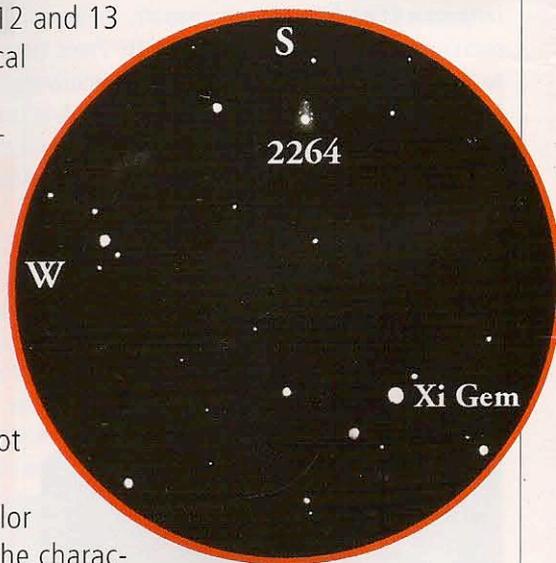
Digital photography should easily pick up nebulosity throughout the Christmas Tree Cluster. Although the human eye cannot perceive color in faint nebulae, color images capture the characteristic red emissions of glowing hydrogen gas.

Perhaps the most popular images of NGC2264 contain a region known as the Cone Nebula, a conical-shaped dark nebula embedded in the emission nebula and located just south of the top of the Christmas Tree asterism.

Regardless of whether it is captured at the eyepiece or the computer screen, NGC2264 is an excellent object to view during the winter season. \*



The namesake shape of the Christmas Tree Cluster, NGC 2264, becomes apparent when observed in an inverted position. Taken by the author using a 190 mm f/5.3 Maksutov-Newtonian telescope with a SBIG ST-2000XCM CCD Camera.



NGC 2264 is found by first slewing the telescope 40% of the distance between Betelgeuse and Procyon, then moving it directly north one finder of view. The nebula and cluster appear as a fuzzy star lying near the top of an inverted 6° field of view with 3.3 magnitude Xi Geminorum shining near the bottom.