

Armchair Astronomy No.5 - Nebulae, Galaxies and Clusters

Heavens Above! Astronomy from your Armchair. (© R Bee 2007)

Nebulae, Galaxies & Clusters

Let's look at deep space astronomy – things that make you go “Wow!” in the night.

Some of the most beautiful objects studied by both professional and amateur astronomers come under the mundane title of NGCs. This stands for New General Catalogue and lists objects from NGC1 to NGC9999. But I have my own acronym for NGC – Nebulae, Galaxies, Clusters. That is simply because every object with an NGC number is, in fact, either a nebula, a galaxy or a cluster. If it looks, walks and quacks like a duck, call it a duck.

The sky is teeming with NGCs and with the exception of the galaxies, all are contained within our home galaxy, the Milky Way. Certainly all the other galaxies will have their own collection of nebulae and clusters which we can't see. It is when you stare at such an object through a telescope (in many cases, just binoculars) or gaze on a beautiful full colour photograph taken through a telescope, that you really come to appreciate the awesomeness, the majesty of the universe.

Star clusters come in two types – Open Clusters and Globular Clusters. Each have their own attraction. The ‘globs’, fuzzy spherical ‘balls’ of ancient stars, numbering from the tens of thousands to the millions, have their astronomical and cosmological significance and, to the initiated, are awesome to observe. But for sheer beauty, the open clusters win hands down. Unfortunately, with the exception perhaps of the Pleiades and Hyades in Taurus, the Beehive in Cancer and the Coma Star Cluster in Coma Berenices, very few star clusters were known to the pre-telescope cultures and, more pointedly, poets. We had to wait for the light gathering and magnification of telescopes to reveal gorgeous star patterns and colours in such clusters as the Jewel Box in Crux, the Wild Duck Cluster in Scutum and the Southern Beehive in Carina, to name but a few.

Nebulae are the glamour queens of deep space. Some are huge clouds of glowing hydrogen gas, tens of light years across, giving birth to new stars as we watch. Stellar nurseries. Others are the remnants of the death throes of old stars, lending their used gas and heavier elements to the interstellar medium to help in the creation of new stars, and so on ad infinitum. Like snow flakes, no two nebulae look alike and this leads, with astronomers' overactive imaginations, to names as colourful as their subjects. The Great Orion Nebula, Helix, Saturn, Blinking, Crab, Veil, North America, Tarantula, Clown Face, Ring, Rosette, Trifid, Dumbbell, Swan, Lagoon, Cat's Eye Nebulae are some classic examples. If only Keats or Tennyson could have seen the images from modern telescopes, they would have run out of quills and ink in trying to describe the imagery.

Galaxies, galaxies everywhere. Astronomers estimate there are about 100 billion galaxies in the observable Universe, each with an average of about 200 billion stars. To an amateur astronomer through the eye-piece of his modest telescope, a galaxy looks like a wispy white or gray smudge, generally oval in shape, some cigar-like if edge-on, perhaps with a brighter concentration at its centre. One might even detect the hint of spiral arms reaching out from the centre. But in a time-lapse photo taken with the same scope – *“How surpassingly lovely is the plainest of them”* to quote Frederic from *Pirates of Penzance*.

In looking at galaxies, we are seeing back millions of years in time. The Hubble Space Telescope has captured images of early galaxies from almost 10 billion years ago. But the closer ones we see in detail are indeed surpassingly lovely, with their delicate spiral arms, like Catherine Wheel fireworks. Indeed, one such galaxy has that name, while another is dubbed the Whirlpool Galaxy. Our own Milky Way Galaxy, seen from millions of light years, would appear similar to those. The spiral arms contain the gas clouds with the younger generations of stars, glowing with hues of blue and pink, while the core stars glow with a blazing yellow as they approach stellar senility.

Space is indeed deep, but beautiful. To quote Frederic again: *“... oh, rapture, unexampled.”*