

A Brief Column for the Beginning Stargazer Introducing New Astronomical Terms

Astronomy is rich with terminology. This column originally began about ten years ago (January 1999). Its intent was to help beginning stargazers ease into the world of astronomy by introducing a new basic astronomical term (word, acronym or abbreviation) each month.

However, other duties prevented the author from contributing monthly “Å to ZZ” columns since January 2002. Consequently, this column appeared only twice since then (April 2002 and Feb/Mar 2005).

This month I will add one additional term to this column, although I cannot promise when the next installment will occur!

In any case, “Astronomy from Å to ZZ” originally started with the letter *a* (for *apparent magnitude*) and is alphabetical using successive letters for each column’s entry. The Feb/Mar 2005 column ended with *m* (for *meridian*), half way through a second cycle of twenty-six terms.

(Following this article is an index of all terms that have appeared in this column.)

Therefore, our next entry should start with the letter *n*. A good choice for this letter is **NGC**, a common abbreviation associated with **deep-sky objects** (*non-stellar* objects not members of the Solar System).

Note: The name of this column, **Å to ZZ**, starts not with the letter A but with **Å**, the symbol for ångström (after Anders J. Ångström), a very small unit of length (0.1 nano meters or 10^{-10} m).

WORD OF THE MONTH FOR NOV/DEC 2008

NGC An abbreviation for the **New General Catalog**, actually the **New General Catalog of Nebulae and Clusters of Stars**, and one of the most comprehensive lists of deep-sky objects. Although published 120 years ago, this catalog

contains a numbering system for deep-sky objects that has stood the test of time (Dreyer, J.L.E., 1888, *Memoirs of the Royal Astronomical Society*, Vol. 49, pp. 1–237).

The Danish astronomer, John Louis Emil Dreyer (1852–1926) of the Ammagh Observatory, Ireland, compiled this catalog based on previous work by John F.W. Herschel (1792–1871). John Herschel had published his own catalog in 1864, *the General Catalog of Nebulae*, based on his own discoveries and that of his famous father, Friedrich (Frederick) William Herschel (1738–1822), the discoverer of Uranus. William Herschel was one of the earliest deep-sky observers and maker of hundreds of reflecting telescopes including his great 49-1/2 inch (126 cm) diameter speculum reflector with a 40-foot (12 m) focal length.

The NGC contains a list of 7,840 non-stellar objects including *galactic nebulae*, *star clusters* and *galaxies*. However, the latter are not included in its title since nineteenth century observers did not know the latter as *galaxies*. These vast star systems simply appeared as extended nebulous objects in their premodern telescopes that could not resolve their galactic stellar components.

Dreyer, extended this catalog in two supplements, the first and second **Index Catalogs (IC I and IC II)** published in 1895 and 1908 respectively. This added 1,529 and 3,857 objects or a total of 5,386 additional deep-sky objects. This brings the grand total in all three catalogs to 13,226 objects found over the entire sky!

Although deep-sky objects may also have other catalog designations, NGC and IC numbers remain widely used to identify deep-sky objects. Consequently, most astronomical, non-stellar objects amateur astronomers will likely observe are in the full NGC Catalog.

The *NGC Catalog* numbers objects by increasing *right ascension*, a common method, along with positional information and a brief description.

Right ascension, including *declination*, are celestial coordinates analogous to longitude and latitude on Earth. Right ascension is measured eastward along the *celestial equator* from the *vernal equinox*. Therefore, NGC numbers help show position on the sky. This is a common practice in many deep-sky catalogs.

The abbreviation NGC appears in some *Star Trek* episodes. However, *Star Trek NGC objects* do not usually correspond to real NGC deep-sky bodies. For example, *Star Trek* calls NGC 321 a star cluster and NGC 667 a planet, but both are actually galaxies.

The *NGC Catalog* is now available on the web including *The Interactive NGC Catalog Online* at seds.org/~spider/ngc/ngc.html, the *Revised New General Catalogue and Index Catalogue* at www.klima-luft.de/steinicke/ngcic/rev2000/Explan.htm, the *Whole NGC* at www.astrosurf.com/benoit/ngc.html, and *The NGC/IC Project* at www.ngcic.org. The latter, an excellent web site, attempts to correct many errors in the original NGC.

The NGC/IC Project Home Page states:

“The NGC/IC Project is a collaborative effort between professional and amateur astronomers to correctly identify all of the original NGC and IC objects, starting with the original discoverer’s notes and working forward in time to encompass the work of contemporary astronomers, both professional and amateur.”

OTHER COMMON DEEP SKY CATALOGS

The Messier Catalog

Amateur and professional astronomers are also familiar with other deep-sky lists especially *Messier* catalog numbers (abbreviated *M*). Charles J. Messier (1730–1817), a French astronomer and devoted observer, compiled a list of about 100 bright nebulous looking objects so he would not confuse them with comets. He

published his final list of 103 objects in 1781, a list later slightly extended by others to 110.

Among the faintest in his list, at apparent magnitude +11, are the *Little Dumbbell* and *OW Nebulae*, planetary nebulae designated M76 and M97 or NGC 650/651 and NGC 3587 respectively. However, do not look for the brightest Messier object in the NGC, the *Pleiades Open Star Cluster* (M45). This breathtaking cluster has no NGC/IC number because it is an easy naked eye object with an integrated apparent magnitude of +1.2.

Since Messier used small telescopes (effective apertures of about 4-inches or less), all Messier objects can be viewed in small scopes. (Messier did not discover all objects in his list.) In fact, a modern 4-inch refractor would surpass Messier’s instruments.

Therefore, Messier objects are typically the largest and brightest deep-sky objects. His catalog represents a “first choice” list of deep-sky objects since amateurs can see all in a 4-inch telescope. But, to view most NGC/IC objects requires a 16-inch or larger telescope.

Thus, although Messier objects also carry NGC numbers, Messier designations are more often used than their NGC designations. A notable exception is the bright, spectacular *Double Cluster* η & χ Persei, mysteriously not listed by Messier. The reason is unclear although Graun (2005) has written about this mystery. Consequently, the *Double Cluster* remains an NGC but not Messier object numbered NGC 869 and NGC 884. (Graun has suggested adding these clusters as M111 and M112.)

The Caldwell Catalog

The *Caldwell Catalog* (1995), compiled by the legendary British amateur Patrick Moore (1923–), is a modern complement to the Messier Catalog adding 109 additional bright, deep-sky objects for amateurs. The brightest is C41, the *Hyades* (an open star cluster), which has no Messier or NGC/IC number because of its large size filled with many bright naked eye stars. However, C41 also carries the catalog

designations Melotte 25 and Collinder 50 (an open cluster catalog). The faintest looking (apparent magnitude +11.9) is probably C24 (NGC 1275), or *Perseus A*, an elliptical galaxy dominating the huge *Perseus Cluster of Galaxies*.

Both Messier and Caldwell objects are now available on quick-reference, 9x12 in., laminated sky charts from Sky Publishing Corp. at

www.skyandtelescope.com (\$5.95 each.) These charts also tabulate NGC numbers, positions, sizes, and magnitudes on the back.

Nevertheless, the NGC remains one of the most extensive and widely used catalogs of deep-sky objects although published more than a century ago. ☐

EXAMPLES OF COMMON NGC OBJECTS

NGC *	M45	Pleiades	Open Cluster
NGC 104		47 Tucanae	Globular Cluster
NGC 224	M31	Andromeda Galaxy	Spiral Galaxy
NGC 869	M111†	h Persei	Open Cluster
NGC 884	M112†	Chi Persei	Open Cluster
NGC 598	M33	Pinwheel Galaxy	Spiral Galaxy
NGC 1652	M1	Crab Nebula	Supernova Remnant
NGC 1976	M42	Orion Nebula	Diffuse Nebula
NGC 2237		Rosette Nebula	Diffuse Nebula
NGC 2632	M44	Praesepe	Open Cluster
NGC 3372		Eta Carina Nebula	Diffuse Nebula
NGC 4755		Jewel Box	Open Cluster
NGC 5128		Centaurus A	Elliptical Galaxy
NGC 5139		Omega Centauri	Globular Cluster

NGC 5194	M51	Whirlpool Galaxy	Spiral Galaxy
NGC 6205	M13	Hercules Cluster	Globular Cluster
NGC 6514	M20	Trifid Nebula	Nebula + Cluster
NGC 6523	M8	Lagoon Nebula	Diffuse Nebula
NGC 6720	M57	Ring Nebula	Planetary Nebula
NGC 6853	M27	Dumbbell Nebula	Planetary Nebula
NGC 7000		N. American Nebula	Diffuse Nebula

*Dreyer did not list the *Pleiades* (or *Hyades*) open star clusters because their large sizes make them easy naked eye objects.

†Not "official." Suggested by K. Graun (2005).

References

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