

NATURE'S LABORATORY

*"Be humble for you are made of the Earth.
Be noble for you are made of the Stars."*

--Serbian Proverb

In the Orion arm of the galaxy known to us as the Milky Way lies the solar system we on Earth call home. This galaxy is a family made up of more than a million stars, one of which we call the Sun. At close to 99.86 percent of our entire solar system's mass, the Sun lies at its very center. Although it's the star we on Earth are most familiar with, there are innumerable stars scattered throughout the heavens

The civilizations that came before us cataloged and labeled patterns in those thousands of stars into constellations, each with its own name and combination of twinklers. Although many constellations like Orion and Perseus are familiar to the occasional stargazer, there are scads of constellations with more curious names like Camelopardalis, Antila, Pyxis, Fornax, Mensa, Corvus, Reticulum, and Pavo.

There are 88 constellations recognized in the Northern and Southern Hemisphere; 72 of those are visible from our vantage in the Northern Hemisphere. Every evening, the night's stars take to the heavens about four minutes earlier. That's about thirty minutes earlier each week, or two hours earlier every month. This accounts for why we see different stars and constellations at different times of the year.

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A constellation isn't just an array of particularly bright stars; it encompasses a collection of stars that, together, fill the sky like pieces in a jigsaw puzzle. For instance, the Big Dipper is in fact only a small part of a greater constellation, Ursa Major, or the Great Bear. The Big Dipper is only the tail and hindquarters of the Great Bear, and there are a number of other stars that help define its constellation.

Constellations and their stars all have stories to tell. In the Big Dipper, where the handle of heaven's cookware bends, the bright star Mizar is accompanied by a smaller star, Alcor. Although the stars are more easily distinguishable today, in days past stargazers were considered to have a sharp eye if they could discern between the two. Moreover, Mizar itself is a telescopic double, appearing to be one star with the naked eye, but is in reality a pair of stars viewed in the same line of sight.

The two stars that delineate the Big Dipper's front are known as the "Pointer Stars." A line drawn between the Pointer Stars points upward six lengths to Polaris, the Pole Star, the functional celestial pole around which the heavens rotate.

Directly opposite Ursa Major across the celestial axis lies Cepheus, the Monarch. Cepheus appears as a roughly drawn house with a steeped roof, much like a child's drawing. In the neighboring skies, Cygnus bears its cross. Known more familiarly as the Swan, Cygnus is also aptly referred to as the Northern Cross. The cross' topmost star, Deneb, is number eighteen of the twenty brightest stars.

Cygnus lies directly in the path of the Milky Way, a glittering spread of stars. The top-left quadrant of Cygnus, a particularly dark splotch in the Milky Way, is known as the "Coal Sack." This dark spot is due to a cloud of cosmic dust blocking out any starlight.

To complement heaven's cross hangs Corona Borealis, the Northern Crown. This semicircle of stars is marked by the exceptionally bright star Gemma, known as the "Pearl of the Crown." Corona Borealis' stars are unique in that they vary in magnitude, increasing or decreasing in brightness unexpectedly. These stars that change in magnitude are called irregular variable and recurrent novae stars.

Stars come in a variety of flavors. For example, blue supergiants like Rigel are a type of star known to be the bluest, hottest and most luminous of stars, while red supergiants like Betelgeuse are the largest class of stars and some of the brightest. A neutron star is a remnant of a star that implodes, and a variable star is one that exhibits a change in magnitude over time.

A binary star is a pair of stars that appear as one to the naked eye, but are in fact two stars that, because they revolve around their own center of gravity, are in their own system. Binary stars can be visual, appearing as two stars through a microscope; spectroscopic, visible as two stars only through spectroscopic observation; or eclipsing, wherein the pair eclipse each other as they pass in their circular orbit.

Hands On: The best way to familiarize yourself with the constellations is to arm yourself with a luminous (glow in the dark) constellation chart. If you need a flashlight to view your star chart, rubber-band a sheet of red cellophane across the lens to keep from losing your night vision. A new moon is the perfect time to stargaze since the moon's reflected light can't compete with the twinkling stars. Similarly, the further you distance yourself from city lights, the better the view.

After you've established some basic constellations, try to navigate your way through the heavens based on stars you can recognize. Which constellations stand out to the naked eye? Which constellations are hard to distinguish?

Constellations were established years ago to help chart and study the night sky. But that doesn't mean those are the only constellations hiding out there. Much like finding characters in the clouds, if you use your imagination, the night sky can open up a world of possibilities.

Matthew Bettelheim graduated from the University of California, San Diego, with a Bachelor's in Science, and is at present a practicing freelance science writer.

