

# What Are Constellations?

**EVER SINCE THE DAWN** of time, we've looked up into the night sky and imagined stories in the patterns of the stars.

The concept of *constellations*, arbitrary groupings of stars that represent familiar shapes, dates back more than 4,000 years to the ancient Sumerians. The Babylonians took the pictorial concept one step further and listed stars in what might be the first ever astronomical catalog, the MUL.APIN. Surviving copies of this compendium date to the 7th century BC, but they contain references to events several thousand years earlier. Astronomy is an ancient science indeed.

Throughout the ages, civilizations around the globe have imposed their own cultural histories and mythologies on patterns in the sky. But it's Greek traditions that bring us the constellations we're most familiar with today. And the person responsible for this was the great Alexandrian astronomer and geographer Claudius Ptolemaeus, commonly known as Ptolemy. In his *Almagest*, written around AD 150, he listed 48 constellations, all but one of which are still extant today (Argo Navis is split into three). Ptolemy drew upon mythologies pertinent to him. And thus he lofted into the sky the legend of Perseus, the Hero, who rescued Andromeda, the Chained Maiden. (Perseus also lopped off the Medusa's head to bring forth Pegasus, the Winged Horse.)

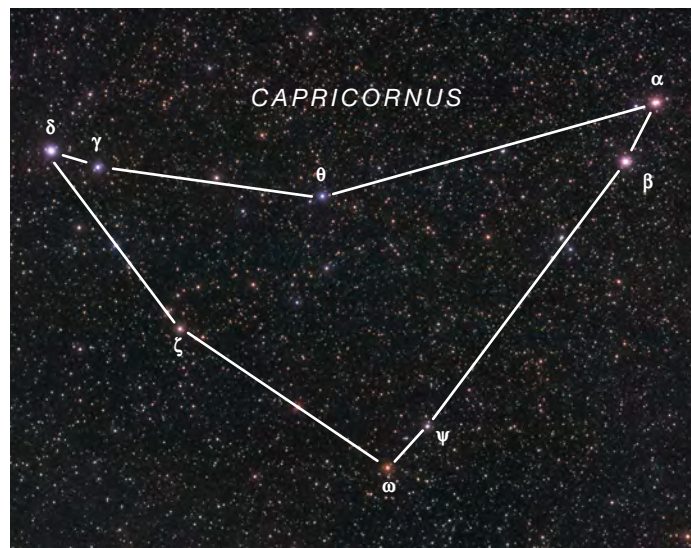
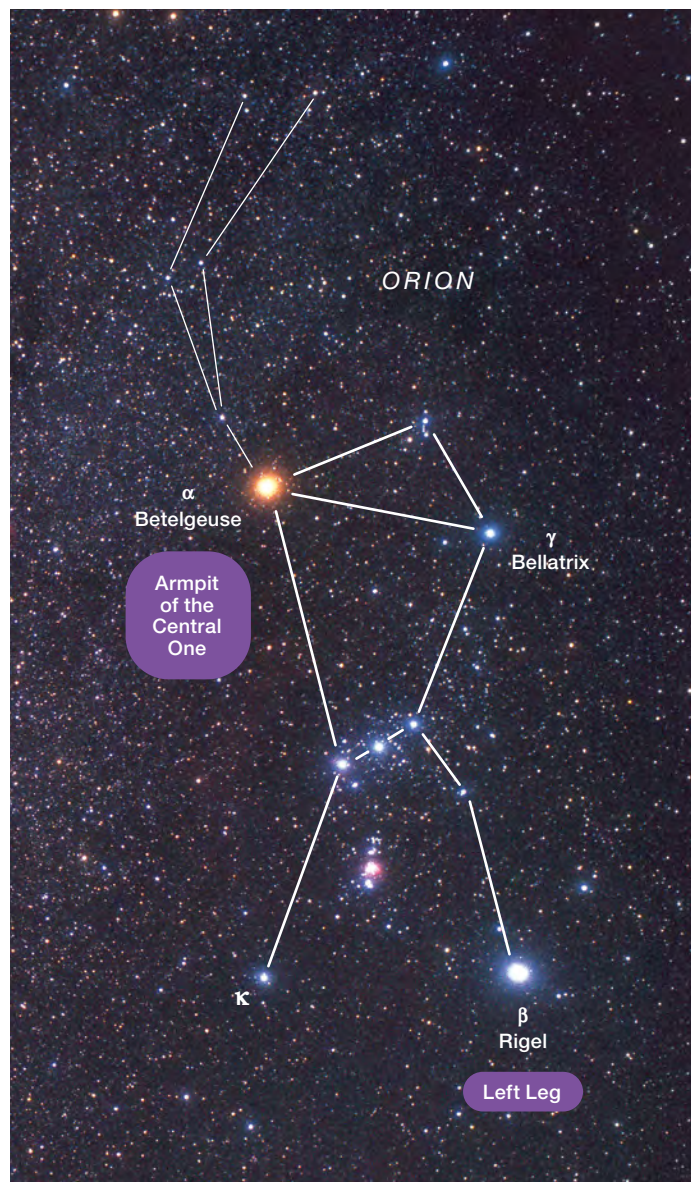
During the Golden Age of Islam, Arab astronomers such as Muhammad Al-Battānī modified and expanded on Ptolemy's scheme. We honor their legacy today in that we still refer to many of the brighter stars by their Arabic names.

## A Plethora of Patterns

For hundreds of years, the Ptolemaic system's status quo held. Then the 15th century ushered in the Age of Exploration. European navigators and adventurers sailed the globe in search of trading routes, treasures, and spices. In so doing, they opened up the Southern Hemisphere skies to astronomers who headed to locations such as the Cape of Good Hope and established observatories. Their exuberant explorations of the southern skies yielded constellations honoring exotic creatures, such as Tucana, the Toucan, and Piscis Volans, the Flying Fish (today known simply as Volans).

After a period of relative soberness during which celestial cartographers appeared to favor the sciences — as a result

► **THE HUNTER AND THE SEA-GOAT** You may need to rely on your imagination to discern the figures the constellations are meant to portray. It's likely easier for you to picture Orion for the hunter he represents than to see a goatlike creature in Capricornus, one of the constellations of the zodiac. We still use the Arabic names for the brighter stars.



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there's Telescopium and Microscopium — we have a foray into the mildly absurd. Enter Globus Aerostaticus, Hot-Air Balloon, and Machina Electrica, Electric Machine, to name but two.

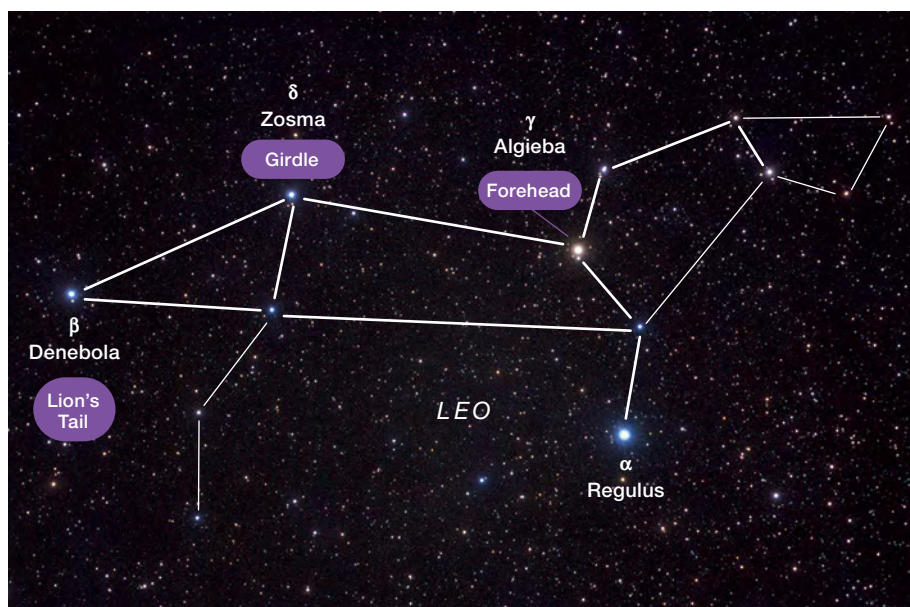
In the first half of the 20th century, with stellar atlases brimming with myriad constellations, the newly founded International Astronomical Union put its foot down and proceeded to clean up this profusion of celestial whatnots. Beginning in 1922, they streamlined the constellations to the marginally more manageable 88 shapes and patterns that we're familiar with today. We might not be able to admire Officina Typographica, the Printing Press, much less the Hot-Air Balloon and Electric Machine, but we recall certain defunct constellations in other ways — every January, for instance, when we view the Quadrantid meteor shower, we're reminded of Quadrans Muralis, the Mural Quadrant.

## Constellations Around the World

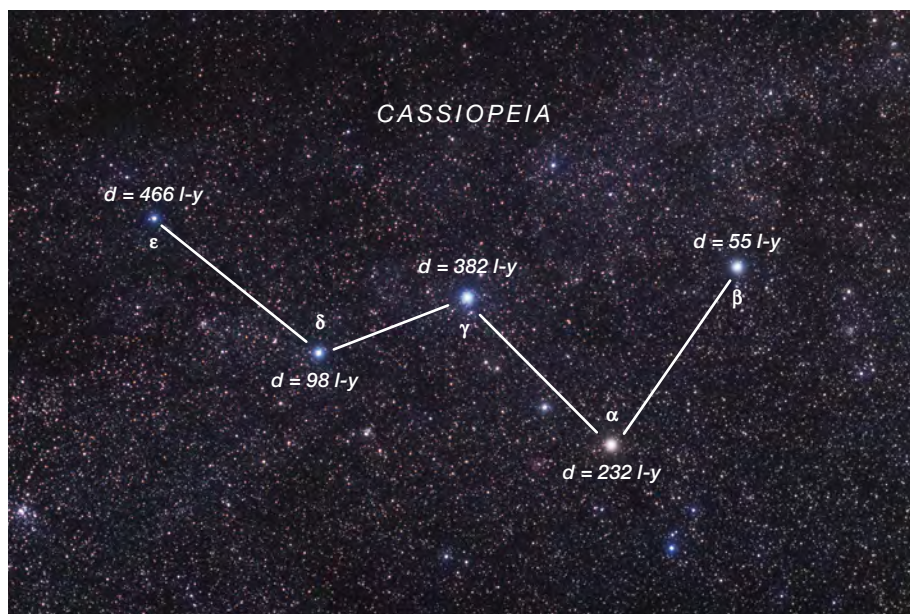
Throughout history, cultures across the globe crafted their own stories of the skies. For example, in the 3rd century AD, the Chinese arranged more than 1,500 stars into a whopping 283 constellations that they called "officials." Obviously, by having that many constellations the patterns were generally much smaller than in the Western tradition.

Not all cultures turned to the bright sparkles in the sky. Several Southern Hemisphere peoples fabricated stories out of the sooty clouds of gas and dust in the Milky Way. And so we have the dark constellations of the Incas, such as Machacuay, the Serpent, and Hanp'atu, the Toad, while in Australia the Kamilaroi gaze upon Gawarrgay, the Emu (S&T: Aug. 2021, p. 12).

One of the most notable constellations in the sky is Ursa Major, the Great Bear. Many cultures refer to that particular pattern of stars as a bear, among them the Wampanoag, Lakota, and Mi'kmaq in North America. The legends of the Indigenous Americans' celestial bear predate the arrival of the first Europeans in the Americas.



▲ **ALPHA-BETA** Leo, the Lion, is one of the 12 constellations of the zodiac. In addition to their popular names, stars in constellations are also assigned Greek letters. With some exceptions, the brightest star is designated by the Greek letter alpha ( $\alpha$ ), the second brightest by beta ( $\beta$ ), the third brightest by gamma ( $\gamma$ ), and so on. The name of Leo's brightest star, Regulus, is Latin for "little king."



▲ **CONSTELLATIONS AREN'T FLAT** One thing to bear in mind when admiring the constellations is that their stars aren't on a flat plane on the sky — they're all at different distances from Earth. For example, in Cassiopeia, the Seated Queen, the stars' distances range from 55 light-years (l-y) for Beta ( $\beta$ ) Cassiopeiae to 466 light-years for Epsilon ( $\epsilon$ ) Cassiopeiae.

This suggests that migratory peoples crossing the Bering Land Bridge from Siberia brought the mythologies with them more than 10,000 years ago. That constellation has been around for a long, long time.

Maybe you see the same pictures in the sky as others do. Or maybe you see your own. Regardless, next time you're out at night at a reasonably dark site, look up into the sky and set your imagination free. ■