

10:00 pm on September 1
 9:00 pm on September 15
 8:00 pm on October 1

To use this chart: hold the chart in front of you and turn it so the direction you are facing is at the bottom of the chart.

- **Bright Stars**
- **Medium Bright Stars**
- **Faint Stars**

Scan dark skies with binoculars:

- M-13: Globular star cluster
- M-22: Globular star cluster
- M-31: The Andromeda Galaxy
- Double Cluster in Perseus

Autumn is coming! The days are getting shorter and the nights longer. The autumn equinox is on September 22. On this date, the Sun rises due east and sets due west.

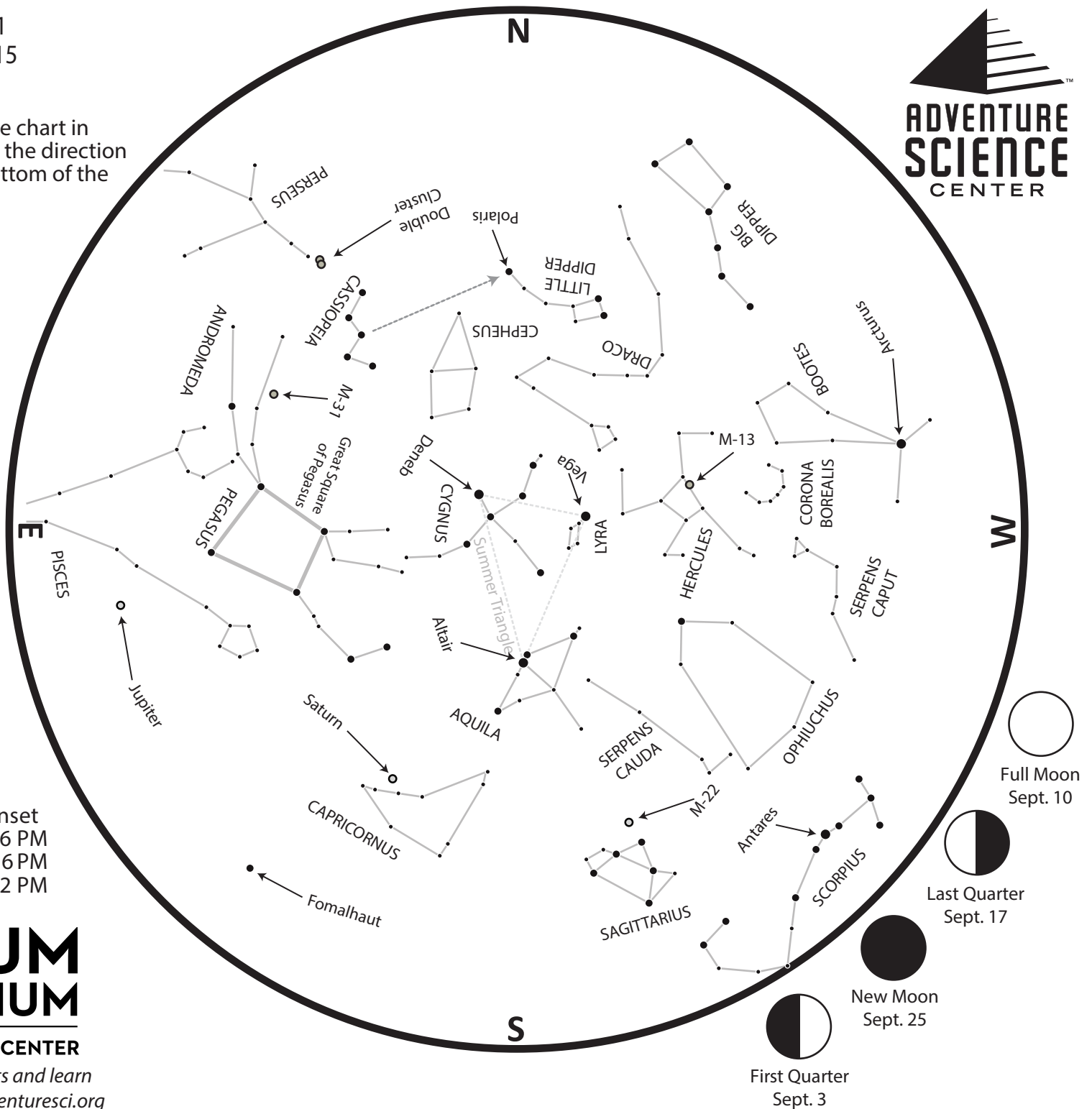
From Nashville:

	Sunrise	Sunset
Sept 1	6:18 AM	7:16 PM
Sept 15	6:29 AM	6:56 PM
Oct 1	6:42 AM	6:32 PM

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SEPTEMBER 2022

After Sunset

Look low in the northwest for the **Big Dipper**. As famous as the Dipper is, it's not always easily visible from our latitude in Tennessee. In the spring and summer, the Dipper is easy to find shortly after sunset. As we approach autumn, it gradually appears lower to the northern horizon.

The Big Dipper is not officially a constellation; it's what astronomers sometimes call an **asterism**. It's a familiar name for this pattern of stars, especially used by observers in the United States, but it's not one of the 88 constellations recognized by astronomers worldwide. **Ursa Major the Great Bear** is the official constellation here, but you'll need dark skies to see its fainter stars.

Use the two stars at the end of the Dipper's bowl to lead you to **Polaris**, also known as the **North Star**. Polaris is not a particularly bright star, but it does remain fixed in the sky throughout the night and throughout the year. When you face the North Star, you're facing due north. Polaris is at the end of the handle of the **Little Dipper**. This group of stars is also officially known as **Ursa Minor the Little Bear**.

Next, turn your gaze high overhead for the three bright stars that make up the **Summer Triangle**. These may be the first stars you see as the sky begins to darken. Each of these stars is part of its own constellation. **Cygnus the Swan**, **Aquila the Eagle**, and **Lyra the Harp** are more easily seen under dark skies.

Low in the southwest is the hook-shaped constellation **Scorpius the Scorpion**. The red star **Antares** marks the heart of the scorpion. This star's name means 'rival of Mars', as its red color nearly matches that of the 'red planet.'

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Just to the east of Scorpius is **Sagittarius the Archer**. To ancient civilizations it may have looked like a mythical centaur holding a bow and arrow, but to modern stargazers it looks a lot more like a teapot.

Look to the south for **Saturn**. Meanwhile rising in the east is **Jupiter**. Jupiter is the brighter of the two.

Jupiter is approaching **opposition** this month. This means the giant planet will be roughly opposite the Sun in our sky, and the closest it will be to Earth this year. At opposition, a planet rises about the same time the Sun sets. The exact date of opposition is September 26, but there is no need to wait or be disappointed if it's cloudy that night. Jupiter will be especially bright for many weeks. Whenever it's visible it's always a great target for backyard telescopes. A small telescope not only reveals the four largest moons of Jupiter, but also the planet's cloud bands. Jupiter has stripes!

You may be even able to see those four **Galilean moons** of Jupiter with just a good pair of binoculars. If you have trouble pointing your binoculars at Jupiter, try leaning them up against the side of a building or another steady surface. Whatever you use to get that close-up view, watch the moons over several nights as they orbit around their parent planet.

Saturn reached opposition last month. It's still bright but will gradually fade as its distance to Earth increases. Saturn's rings are easily visible with a small telescope.

Look for the Moon near Saturn on the 8th and near Jupiter on the 11th and 12th.

From Dark Skies

Bright outdoor lighting can make it hard to see all but the brightest stars. On a clear night, find a dark spot far away from city lights, give your eyes time to adjust to the dark, and look for even more celestial sights.

Late summer evenings are great for spotting the **Milky Way** coursing from Sagittarius and Scorpius, through the Summer Triangle and on towards **Cassiopeia the Queen** in the northeast. This hazy band of light is the bulk of our disc-shaped galaxy, as we see it from within.

As you look towards Scorpius and Sagittarius, you are looking in the direction of the dense center of the Milky Way Galaxy. Scan with binoculars or a telescope in this area to find many faint star clusters and nebulae throughout this part of the sky.

Early Morning

As the Earth orbits the Sun throughout the year, the constellations rise and set just a little bit earlier every day. You won't see much difference from night to night, but you will over the course of weeks or months. What we see in today's pre-dawn sky is a preview of the early evening sky in later months. Go out before dawn this month for a look ahead at the early winter night sky.

In the hours before dawn, Scorpius, Jupiter, Saturn, and most of the Summer Triangle have already set. Meanwhile, autumn constellations such as **Pegasus the Flying Horse** and **Andromeda the Princess** are high in the west. Winter constellations **Orion the Hunter** and **Taurus the Bull** are high in the southeast.

The red planet **Mars** rises about midnight. It starts the month right next to the red-orange star Aldebaran in Taurus. Can you tell the difference between the two? Mars will be brighter and not twinkling like stars do. Look for the Moon near Mars on the morning of the 17th.

Trying to find Polaris in the morning? You'll have a challenge on your hands if you look first for the Big Dipper – it and the rest of Ursa Major are now hiding near or below the northern horizon. Instead, locate W-shaped Cassiopeia high in the sky. The central peak of the W forms an arrow that points you in the direction of Polaris.

Before you set your alarm for the wee hours of the morning, consider planning out your observing. Desktop planetarium software like the free, open-source Stellarium (stellarium.org) can show you more precisely where night sky objects will be on any date and time, and help you plan ahead.

This Month in the Sudekum Planetarium



DARK UNIVERSE