

Star Guide: Telescopes bring depth to cosmos



The global cluster M13.
Photo/Ryan Berendsen

By Tony Berendsen

Stargazing with the unaided eye provides a spectacular view of the cosmos. The broad vista our eyes give us yields a multitude of stars, the Milky Way's hazy band, and maybe an occasional meteor. It's breathtaking, but even though it is a four-dimensional view, the unaided glance seems very two-dimensional; a small telescope or binoculars can add depth.

Gaze through a small aperture telescope or a astronomy binoculars and the moon's grey tones transform into features of craters and mountains. The planet Jupiter at 500 million miles becomes an "other world", a strange distant place with the four large Galilean moons locked in eternal dance about the great planet. Saturn at 800 million miles shows its rings, and the star-like point of light we know as the moon Titan stands near.

Those views begin to tell the story of distance and time, but are in close proximity and only in terms of millions of miles and minutes and hours of time.

It is viewing deep space objects beyond the grasp of our sun's influence that begin to give real depth and perspective to our surroundings. We live in a galaxy thousands of light years across. It's a big place populated by billions of stars with an untold number of undiscovered places. The distances to them are immense.

Albireo is a famous double star that marks the beak of Cygnus the Swan. It's located high in the sky within the summer triangle and easily found using an astronomy app in dark skies. It's a beautiful color combination with one star sapphire blue and the other amber red, and best viewed with a telescope. Both are located about 380 light years from the Earth, taking the distance and time aspect of our view to a much greater magnitude. Imagine those two beautiful stars are 380 years back in time.

The Cygnus Star Cloud resides in the same area of the sky, but is more distant and incredibly massive. It contains some of the largest molecular gas clouds found in the galaxy. Binoculars will yield the best view, so find a comfortable spot to lay down and scan the sky throughout the constellation of Cygnus and you will be amazed at the number of stars concentrated in this area. The distances vary to the stars in this region because you are looking at the edge of one of the spiral arms of our galaxy, but are in the realm of 1,600 light years.

Last but not least, point your telescope or binoculars to the keystone center of the constellation Hercules to find the great globular cluster M13. Again, an astronomy app such as **SkyPortal** will help point the way. In the mid-summer this object is straight up so lay down again with the binoculars and look carefully between two of the stars in the keystone for a small fuzzy object. You are seeing a hundred thousand stars in that fuzzy ball of light that is 25,000 light years in the distance and 25,000 years back in time at the fringes of our own galaxy. A small telescope will begin to resolve

some individual stars of this massive formation too.

Of course imagination is the ultimate tool to use for appreciation of the distances to objects seen in our galaxy through telescopes and binoculars. Think of the distances in terms of time. It takes light one year to travel 6 trillion miles. A trillion miles is a distance so large its very difficult to imagine, instead imagine that Albireo's light began its trip to us about the same time Galileo was convicted of heresy for his belief that the Earth revolved around the sun. Imagine what the Earth was like 25,000 years ago.

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