

How far can you see?

When looking through our telescopes, some people ask how far the telescope can see. We want to suggest you look at an object that is an incredible distance away that you can see with your naked eye!

Our description is easiest to follow at roughly 10 or 11 PM local time in August when the Andromeda Galaxy is in the eastern sky. As the night/season progresses, the relationships and measures are consistent but it is difficult to recognize the pattern you may have observed at another position in the night sky. After you have spotted faint, celestial objects such as this, recognition becomes easier (practice makes better).

Try this on moonless nights when you are away from city lights, and when you have spent at least fifteen minutes without any man-made light in your eyes so you have better night vision. This greatly increases your chance for success.

As a measure of angles in the sky, when you extend your arm, your fist covers an angle of approximately 10 degrees. You can try this on the Big Dipper bowl, diagonally, as it is nearly 10° one way and about $10\text{-}1/2^\circ$ the other way.

Find the "Great Square of Pegasus" in the east. It is approximately 15° on each side and is rotated (when in this part of the sky) like a diamond. Find the northern-most star of the 4 that comprise the square, it is the one nearest Polaris, the north star. If not familiar with Polaris and the Little Dipper, the 2 stars at the end of the Big Dipper bowl "point" toward Polaris a little more than 25° away.

From the northern-most star of the Great Square of Pegasus, "hop" by directing your gaze two stars "down" or northeast by about 15° , then hop up (west) 2 stars or about 7° . These 2 stars are fainter and require a more careful look.

Just west of the second star (above when it's low in the eastern sky) of this "up 2" hop is the galaxy. You are looking for a faint piece of fuzz, a small cloud, that is best seen when using your averted vision (look to the side, not just directly at the object). It usually appears elongated, and its perceived size will vary greatly with humidity and clarity of the sky, also your night vision and practice. Look patiently, as the atmosphere will change moment by moment, and sometimes you will see changes in perceived size of such a faint object in real time. Nights vary much in terms of how large this galaxy will appear.

The Andromeda Galaxy is the farthest that most of us can see with our unaided eye at 2.2 to 2.5 million light years distant. That's at the speed of light, 186,000 miles per second, for an incredible 2.2 to 2.5 million years!

No, your phone app will not help you identify this distant object, and you can easily learn to find it if you will make minimal effort. Your phone destroys your night vision (one second of a lighted phone resets the timer, and night vision improves for fully 30 minutes), your phone does a very poor job of actually indicating which celestial object is which, and if you rely on your phone you do not learn a single thing about the incredible night sky we have been given. It is very gratifying to learn even a simple celestial object like this one.

