

Telescopes & Exploring the Night Sky

A silhouette of a telescope on a tripod is positioned on the right side of the image, pointing towards the upper right. The background is a dark night sky filled with stars and the Milky Way galaxy, which appears as a bright, colorful band of light stretching across the sky. The foreground shows the dark silhouette of grass.

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10 minute

Tour of the Universe



It all starts with our Solar System and the visible stars in the night sky.

Our Solar System

1. Sun, a star at the center
2. Our Moon
3. 8 planets & their moons
4. Belts of rocky debris—Asteroid & Kuiper belts
5. Planetoids like Ceres/Pluto in Belts
6. Comets or dirty ice balls

And then there is that Celestial Sphere, a canopy full of stars



Stars

Every star in the night sky is just like our Sun, varying in size but burning brightly by nuclear fusion.

All the stars in the night sky are part of the **Milky Way Galaxy**, where our Sun resides.

The **Milky Way Band** represents the bulk of the stars in our Milky Way Galaxy but are too far away for our eyes to see individually.



Universe

The Universe consists of hundreds of billions of galaxies.

Galaxies are the homes of stars.

Each galaxy contains billions to hundreds of billions of stars.

Most galaxies are roundish in shape.

Practically speaking, there are no stars between galaxies.

Some Shapes of Galaxies



**Our Milky Way Galaxy
may look like this actual galaxy**



Objects in our Galaxy

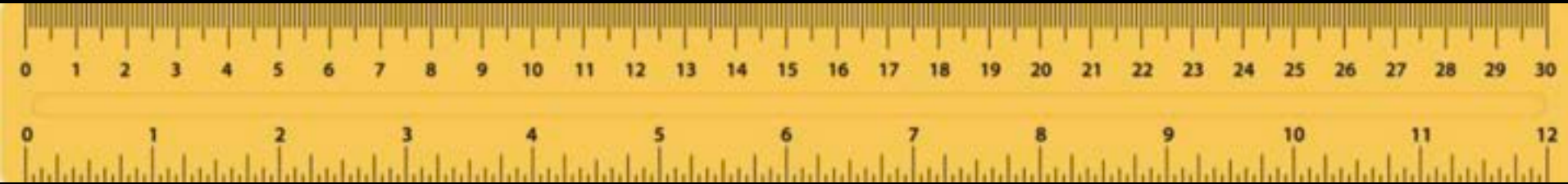
Almost every galaxy has similar objects



These types of objects are called DSOs for Deep Sky Objects

Distances in Astronomy

Unit of length = **Light Year** = 5.88 trillion miles



1. A **LIGHT YEAR** is based on the *distance* traveled by the speed of light because the stars and galaxies *are so far away!*
 - a. Light travels at 186,282 miles per second.
 - b. So, a Light Year is the *distance* that light can travel in one year's time, almost 6 trillion miles (6,000,000,000,000)—a really long ruler.
2. Our Sun is 93,000,000 miles away. It takes light 8.3 minutes to travel this distance. The diameter of our Solar System to Pluto is 11 light hours.
3. The closest star is Proxima Centauri, which is 4.25 light years away. If our Sun was one inch in diameter (size of a quarter), Proxima would be 10 miles away.



Disclaimer 1 of 2

Objects in telescopes may seem closer than they are AND are not as colorful or as detailed as in photos . . . but they are “real” and “alive”!

Disclaimer 2 of 2

There are a lot of exceptions/nuances in astronomy and with telescopes and equipment. I try to stay with the “NORM” to avoid overwhelming you with too many details and exceptions.

