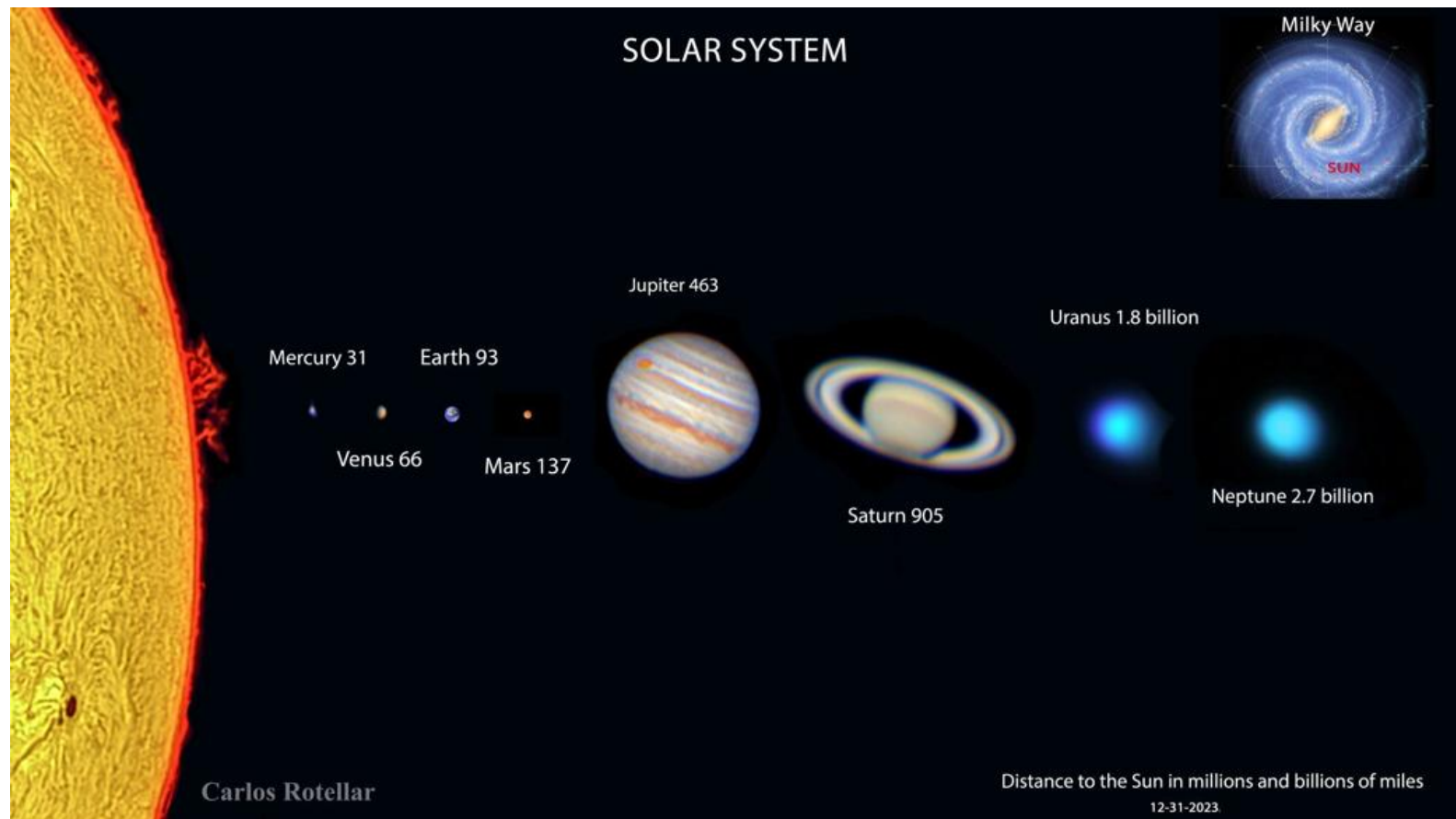


The Final Frontier

Jan 18, 2024



Planets in the Milky Way galaxy are arranged to scale.

Carlos Rotellar

“Space: the final frontier. These are the voyages of the starship Enterprise ...”

Those are the famous words of Captain Kirk from the series Star Trek. It seems that the only way we can travel through space is on a starship, yet we are all space travelers and our starship is planet Earth!

Nothing in space is static. Objects are in constant motion and planets are not the exception. The word planet comes from ancient Greek and it means “wanderer.” Planets move in the night sky with respect to the background of fixed stars and they do not flicker, like stars do.

In this image I have arranged the planets to scale. All photos have been taken from my driveway except, of course, Earth. On the top right corner we can see a graphic of the Milky Way and the location of our solar system within.

Our “starship” Earth is in constant motion. It rotates on its axis at 1,000 mph and orbits the sun at a speed of 67,000 mph, taking a full year to complete one orbit. Our solar system orbits the center of the Milky Way at a speed of 140 miles per second and it takes 230 million years to complete an orbit.

The Milky Way belongs to a cluster of nearby galaxies named the Local Group, which spans 10 million light years in space. The Milky Way travels at the speed of 25 miles per second within the Local Group. The Local Group itself is moving at a speed of 375 miles per second toward the next group of galaxies called the Virgo Cluster, which is located 45 million light years away. As we move farther away, we encounter billions of galaxy clusters which are in constant motion. Let’s not forget that the universe is expanding at a rate of 46 miles per second.

To get an idea of how big the universe is we can try to scale it down. If we assume that our solar system is the size of four football fields, the Earth would be the size of a grain of sand within. Furthermore, if we assume that the universe is the size of the Empire State building in New York, the Milky Way, which is 100,000 light years across, would be the size of a grain of sand.

Our “starship” will continue to travel "to boldly go where no man has gone before!"