

# Lesson 3: Our Solar System

Stars do not wander alone. They gather in vast communities called **galaxies**, enormous collections of stars, gas, and dust all held together by gravity. Some galaxies contain only a few million stars. Others hold hundreds of billions. Our own galaxy, the **Milky Way**, holds somewhere between 200 and 400 billion stars. On a clear dark night, you can see the pale glow of it stretching across the sky, millions of distant suns too far away to see individually, blurring into a ribbon of light.

Our Sun is just one of those stars. An ordinary yellow star near the edge of one of the Milky Way's spiral arms, nothing special in the cosmic scheme of things. And yet, about 4.6 billion years ago, a cloud of gas and dust near the edge of our galaxy began to collapse under gravity. Most of the material pulled toward the center and ignited into our Sun. The rest swirled outward and slowly clumped together into the planets. This is how our **solar system** was born, not built by a designer, but assembled, piece by piece, from the leftover debris of ancient stars.

Earth sits in a location called the **habitable zone**, sometimes called the Goldilocks Zone, the region around a star where it is neither too hot nor too cold for liquid water to exist on a planet's surface. Venus is inside the habitable zone and too hot. Mars is just outside and too cold. Earth is right in the middle. Our planet travels in a stable **orbit** around the Sun, pulled along by gravity year after year, century after century, maintaining just the right distance. This has been going on for 4.6 billion years, long enough for life to appear and flourish.

From the Big Bang came hydrogen. From hydrogen came stars. From dying stars came the elements. From the elements came our solar system. From our solar system came Earth, a small, rocky world in just the right place, circling an ordinary star, in one of hundreds of billions of galaxies. And somehow, here, on this small and fortunate world, the universe produced life. The story of life on Earth is just the newest chapter in the longest story ever told.