

Four hundred years is little more than a blink of an eye in terms of cosmic time. In 400 years the Sun rises nearly 150,000 times, it has been Wednesday 20,000 times, and a Full Moon more than 5,000 times. These are big numbers, but most celestial phenomena evolve much more slowly. The Earth may go around the Sun 400 times in as many years, but Saturn completes less than 14 orbits and Halley's Comet a little more than 5, while the dwarf planet Eris will have completed only 70% of a single orbit.

The night sky hardly changes in 400 years. The fastest moving star in the sky – which is only visible with a telescope – will have moved

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a little more than 1° further north, and to see any real changes in the shapes of the constellations you need to wait a hundred times longer. In 400 years, the Sun completes less than a millionth of its orbit around the center of the Milky Way. That is like walking around the Place de l'Etoile in Paris and only moving 1.5 mm.

Large numbers are the trademark of astronomy, but if we look at it in the right perspective, we see that the universe hardly changes in 400 years. The Sun may convert 50 quadrillion tons of hydrogen into helium in that time, but that is only a trillionth part of its total mass. And although the Andromeda galaxy has moved more than a trillion kilometers closer to the Milky Way, that only means that the light it emits takes a month less to reach us than the two and a half million years that we are used to.

In the age of the universe, 400 years is about the same as one minute in the life of an old person. In our Milky Way, a few hundred new stars may have seen the light, and in the vast cosmos with its countless galaxies, a few billion supernovas will have exploded. But generally speaking, the universe looks exactly the same today as it did at the start of the seventeenth century. In that period of time the universe has just blinked.

That makes it all the more remarkable when we look at what has changed in our understanding of the universe. From their rather inferior place in space, on a small planet at the edge of a spiral galaxy, astronomers have succeeded in penetrating to the depths of the universe and into the vaults of cosmic history. Our knowledge of the universe has undergone a revolutionary development, largely thanks to the invention of the telescope in 1608.

This *Atlas of Astronomical Discoveries* offers a spectacular review of the past 400 years of telescopic astronomy. In one hundred breathtaking snapshots, it looks at the most important astronomical discoveries since the invention of the telescope. Short texts tell familiar and less well-known stories behind these discoveries – stories of amazement, curiosity, perseverance and luck, but above all, stories of the unstoppable process of unraveling the secrets of the universe in which we all live.

In the next 400 years, the cosmos will again change very little. But we are likely to have to wait much less for new revolutionary developments in astronomy. A few orbits of the Sun, at the most.

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