almost two complete solar cycles. The images were taken at the beginning of April each year, from SOHO’s EIT from 1996 (smallest, most distant disc) to 2015 (largest, central disc) over a region, allowing details of the corona to be seen.

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THE SOLAR-HEATING MYSTERY

The Sun's surface brightness is an important part of SOHO's long-term observations, as it can reveal valuable information about solar activity and space weather conditions.

THE SHINE LIKE A STAR

The Sun is a star and, as such, it emits energy in the form of light and heat. This energy is produced through nuclear reactions in its core, which convert hydrogen into helium. The Sun's core temperature is about 15 million °C, and its surface temperature is about 5500 °C. The Sun's magnetic field is thought to be the source of this heat, but the exact mechanism is still not fully understood.

THE SOLAR-DIVING MYSTERY

The Sun's corona is heated to the extremely high 1–2 million °C, but why? This is a long-standing mystery of solar physics, and scientists have made great strides in answering this fundamental question. They measured how it is accelerated to beyond 3 million km/h. Scientists have made some progress in understanding how the solar wind is energized and accelerated to these high speeds.

THE DEEPER INSIDE THE SUN

The Sun's core contains hydrogen and helium, which are heated by nuclear reactions. The core temperature is about 15 million °C, and the surface temperature is about 5500 °C. The Sun's magnetic field is believed to operate at the Sun's core, but its nature and origin are still not fully understood.

THE SOLAR-DIVING MEASUREMENTS

SOHO has enabled astronomers to observe the Sun's dynamo, which generates the Sun's magnetic field. The measurements showed that, near the equator, the outer layers rotate faster than the inner layers, while at mid-latitudes and near the poles the rotation is slower. This is because the Sun's magnetic field, which is generated by the Sun's dynamo, changes its orientation over time.

THE SOLAR-DIVING IMAGERY

Composite image combining EIT images from three wavelengths shows the Sun's magnetic loops extending above the Sun's surface. The loops are visible as bright, looping structures that are generated by the Sun's magnetic field. The loops can be seen as they rise and fall over the Sun's surface, and they are thought to be the source of the Sun's magnetic field.

THE SOLAR-DIVING WAVES

SOHO also revealed that heavy solar wind ions in coronal holes flow faster and are heated hundreds of times more strongly than protons. The measurements showed that the flow speed and the structure of the Sun's magnetic field are connected, and that the Sun's magnetic field is the source of the Sun's magnetic field.

THE SOLAR-DIVING WAVES AND WAVES

The Sun's magnetic field is believed to be the source of the Sun's magnetic field, but the exact mechanism is still not fully understood. Scientists have made some progress in understanding how the Sun's magnetic field is generated and how it interacts with the Sun's plasma.

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SOHO, the ESA–NASA Solar and Heliospheric Observatory, is studying the Sun, from its deep core to the hot and dynamic outer atmosphere, the solar wind and solar energetic particles.

Launched on 2 December 1995, the satellite circles the L1 Lagrangian point some 1.5 million km from Earth in the direction of the Sun. There, SOHO enjoys an uninterrupted view of our star.

Originally planned for a two-year mission, its numerous extensions have allowed it to cover nearly all of two 11-year solar cycles: the complete cycle 23 and a large fraction of cycle 24 so far. SOHO is thus the longest-lived Sun-watching mission.

Although four of the original 12 science instruments are no longer used – they were superseded by the next generation of sensors on newer missions – SOHO continues to provide unique and important measurements of our star.

Crucially, we rely on the mission to monitor the effect of space weather on our planet, and it plays a vital role in forecasting potentially dangerous solar storms.

In addition to investigating how the Sun works, SOHO is the most prolific discoverer of comets in astronomical history, with the destinies of more than 3000 tracked as these icy worlds endured fiery encounters with the Sun. The majority have been found by amateurs accessing real-time data via the Internet. While many of these sungrazing comets perish in the Sun's heat, some survive, albeit in various states of degradation: SOHO has watched many comets lose their heads and tails during their solar encounters.