

Discovery in an age of dogma

Galileo: Images of the Universe from Antiquity to the Telescope

Palazzo Strozzi, Florence

Before Galileo turned his telescope on the moon in 1609, one popular theory held that it was made of crystal. Others maintained that it was a mirror of the earth or made of fire. Galileo's new instrument, which he developed but did not invent, proved it was nothing of the kind - its surface was marked by craters, valleys and mountains. Other revelations included spots on the sun, satellites orbiting Jupiter and the phases of Venus.

Most famously, Galileo's observation of the planets convinced him that the Polish astronomer Copernicus was right: the earth did move around the sun. Galileo's heliocentrism saw him charged with heresy by the Catholic Church. A genius but not a martyr, he recanted and lived the rest of his days under house arrest in Florence.

To celebrate the 400th anniversary of Galileo's telescope, this exhibition presents his discoveries as just one chapter in the history of astronomy. Its objects - from archaeological finds to scientific instruments, celestial globes and maps, frescoes, paintings, drawings and texts - make for an extraordinarily stimulating voyage.

Man has interpreted the skies since the dawn of civilisation. Fuelled by concern for their crop cycles, ancient civilisations invented calendars based on the phases of the moon and clocks on the passage of the sun. Yet the heavens were also the locus of their deities. Inscribed with graceful line-drawings of the gods, Egyptian waterclocks and sundials testify to a world where reason and religion were fused. Assyrian cuneiform tablets illustrate the Babylonian custom of using complex mathematics to predict planetary movements.

Ancient Greek science did nothing to diminish the power of celestial deities. Pythagoras's conception of the universe as a sphere is embodied by the Farnese Atlas. A Roman copy of a Greek statue, it shows the muscled Titan buckling under the weight of a globe of constellations.

In ancient Rome, astrological portents were used to justify imperial power. Once decorating the walls of Pompeii, "Capricorn", "Pegasus", "Europa on the Bull" and "Centaur" are sublime examples of that epoch's naturalistic imagery.

One of antiquity's most substantial legacies was the *Almagest*. The work of Ptolemy in the 1st century, the 13-volume treatise was the most complete elucidation of astronomical theory yet written, but it was fatally flawed by the ancient Greek's



Portrait of Galileo by Ottavio Leoni (1624)

geocentrism. As Ptolemy lived in Egypt, it was preserved in Arabic and exerted a strong influence on Islamic astronomers. Keen to establish fixed times for prayer and the direction of Mecca, they developed sophisticated instruments - the earliest known geared astrolabe and the only spherical version are here - while Europe languished in the Dark Ages.

Ptolemy, not translated into Latin until the 12th century, is represented here by a 14th-century Florentine manuscript of the *Almagest* and a magnificent Quattrocento rendering of one his flawed but spectacular world maps. His rediscovery, along with classical thinkers such as Euclid, was a linchpin of Renaissance humanism.

In championing classical reason, humanism paved the way for the modern division of sacred and secular thought. Yet in the early Renaissance, Ptolemy's geocentrism made him acceptable to a Church desperate to

uphold the orthodoxy that the earth stood at the centre of the universe. A flurry of religious art that supports this idea finds its creative zenith in "The Motions of the Universe" (1450-1500). Rarely seen outside Toledo cathedral, this awesome tapestry depicts an omnipotent God watching two angels turning an astrolabe crowded with symbols of the constellations and flanked by ancient Greek scientists. This harmonious yet hierarchical vision of the universe is also played out in Botticelli's 1480 fresco of "St Augustine in his Study", which shows the saint staring beyond a geocentric armillary sphere.

Although the Church ferociously defended geocentricity, Copernicus's 1543 text *De Revolutionibus* - an original copy is open at an engaging diagram with "Sol" in tiny letters surrounded by wobbly concentric rings - slipped past the censors thanks to an introduction claiming it was no more than a hypothesis.

Galileo took no such precautions. As his stern gaze suggests in a 1624 portrait drawn by Ottavio Leoni, he was an uncompromising soul. The first post-telescope text, *Sidereus Nuncius* (1610), left no doubt that he supported his Polish predecessor. The book was favourably received in Rome but in 1616 the Inquisition demanded that he end his support of Copernicus. In 1633, Galileo responded with his *Dialogue about Two Major World Systems*, a thinly veiled endorsement of heliocentrism that would lead to the abjuration.

The section on Galileo is packed with attention-grabbing relics, including his first telescope, first editions of *Sidereus Nuncius* and the *Dialogue*, and even one of his fingers. Yet the lunar drawings, executed by Galileo and his successors, reveal an equally important narrative. Aided by increasingly powerful telescopes, these astronomers produced detailed depictions of the moon's surface that mark a watershed in the history of celestial representation. In revealing the material nature of the sky, the Florentine had called into question the concept of heaven itself.

Of course, symbolism did not disappear; the most powerful image here is Rubens's blood-curdling "Saturn Devouring One of his Children" (1636-38), partly inspired by Galileo's observations. Yet, as rational knowledge expanded, the capacity of images to shuttle seamlessly between the real and the imaginary as, say, the Roman frescoes did, diminished. When Galileo looked through his telescope, he heralded the beginning of the split between science, religion and art that would accelerate during the Enlightenment. This exhibition is a rare chance to see the trio briefly reunited.



Lunar drawings by Galileo (1609)

Rachel Spence

Until August 30, tel +39 55 277 6461