OFFICINE PANERAI

museo galileo

GALILEO AND THE MEASUREMENT OF TIME

The new section of the Museo Galileo opens in Florence
Officine Panerai donates the first Jupiterium for display

The **Museo Galileo** in Florence, in partnership with **Officine Panerai**, is inaugurating a new permanent area dedicated to "**Galileo and the measurement of time**" – an interactive space consisting of three rooms, illustrating the fundamental role of Galileo's discoveries in the development of timekeeping systems.

Mechanical models, exhibits operated directly by the user and interactive touch screens illustrate the innovative intuitions and solutions through which Galileo introduced revolutionary new ideas in the architecture of the universe and the science of motion. His ideas also led to the creation of ingenious devices for transforming the primitive, mechanical clocks in use at the time into reliable instruments. Thanks to these innovative solutions, Galileo hoped to solve at last the crucial problem of determining longitude at sea.

In these three new rooms, visitors will journey along the pathways that led to Galileo's confirmation of the Copernican structure of the universe thanks to the telescope; to his definition of the strict mathematical laws that rule the phenomena of motion; and to his discovery of the isochronism of the pendulum, a true milestone in the history of timekeeping.

To celebrate Galileo's contribution to modern horology, Officine Panerai has offered fundamental support to the realisation of the interactive area. It has also constructed and donated to the Museo Galileo the **Jupiterium**, an exceptional planetary clock with a perpetual calendar, which shows the movements of Jupiter and its four satellites discovered by the Tuscan scientist. Standing at the centre of the second room, the Jupiterium shows with extreme precision the positions of the Moon, the Sun, Jupiter and the four Galilean satellites as seen by an observer on Earth, against a background of fixed stars.

The last of the three rooms in the new interactive section displays a spectacular working reconstruction of the Planetary Clock designed by Lorenzo della Volpaia for Lorenzo de' Medici and completed in 1510, in addition to the complex mechanisms of some ancient turret clocks.

"*Thanks to its fruitful and longstanding partnership with Officine Panerai* – stated Professor Paolo Galluzzi, Director of the Museo Galileo – *the Museo Galileo has opened a new section, illustrating some of Galileo's most outstanding achievements, through fascinating exhibits and interactive models. Achievements that not only revolutionised the structure of the universe and of motion, but also led to dramatic improvement in mechanical systems for measuring time, initiating the ongoing process of development that has continued up to the present day. The extraordinary mechanical complexity and absolute precision of the Jupiterium, designed and constructed by Officine Panerai and generously donated to the Museo Galileo, is an evocative example of the close bond between tradition and innovation. The Jupiterium is in fact the solution to what was one of Galileo's dreams – that of using the motion of Jupiter's satellites as a perfect planetary clock – pursued by him with extraordinary intelligence and admirable determination*".

"*We are proud* – stated Angelo Bonati, CEO of Officine Panerai – *to renew our longstanding partnership with the Museo Galileo and to contribute to disseminating knowledge of the role played by Galileo in the field of mechanical clock making. Galileo's legacy is a boundless source of inspiration to Officine Panerai, not only for our common Tuscan origins, but also for the passionate commitment to research and exploration represented by his work*".

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Opening times
Open all through the week 9:30 am - 6:00 pm; Tuesdays 9:30 am - 1:00 pm.

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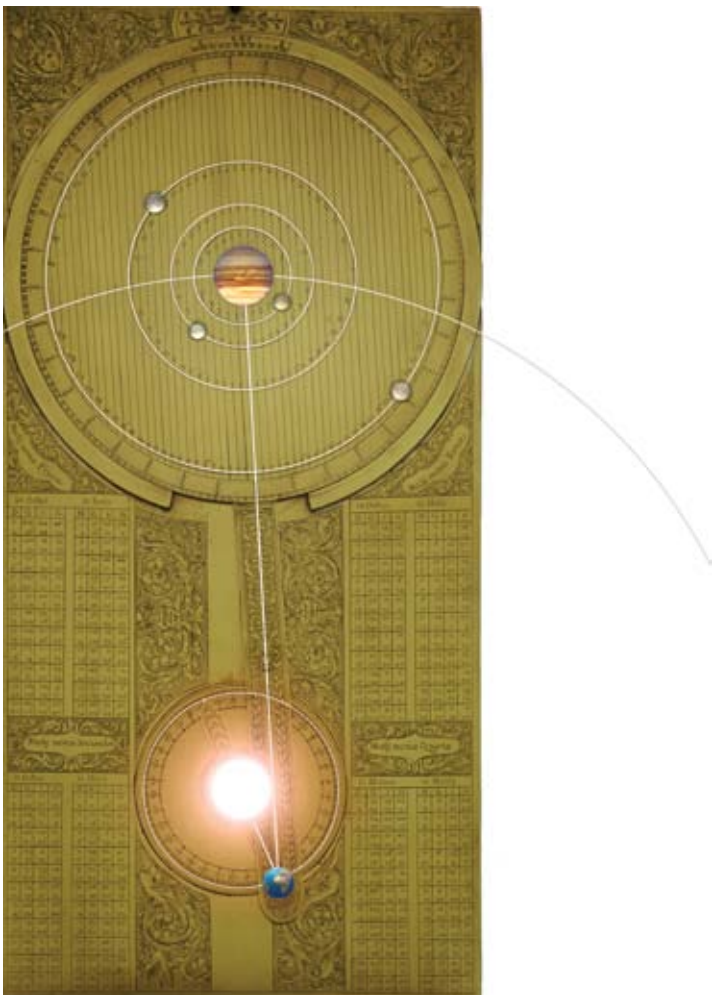
INTERACTIVE AREA
GALILEO AND THE MEASUREMENT OF TIME

A visit to the Museo Galileo concludes with the interactive area, consisting of three rooms devoted to the tangible and virtual exploration of some Galilean instruments.
The experimental component of the research conducted by Galileo is revealed by working models illustrating various aspects of astronomy, mechanics and timekeeping. This section provides a clear picture of the complex operation of scientific instruments, especially the refined mechanical solutions devised by highly inventive instrument-makers to measure the flow of time.

Room I – The Motion of Bodies: Time, Distances and Trajectories

The itinerary starts with two planetariums illustrating ancient concepts of cosmology, according to Eudoxus of Cnidus (4th century BC) and Ptolemy (2nd century AD). Galileo openly rejected these concepts, especially after his sensational astronomical discoveries.
On a touch screen visitors can see the sky as it appeared to the Tuscan scientist through the lenses of his telescope. Another touch screen allows visitors to combine the lenses in different ways and shows the chief characteristics of the solutions devised – after Galileo – by the ingenious scientists and instrument-makers who further perfected the telescope.
The other mechanical models in this room illustrate some of the experiments conceived by Galileo to discover the fundamental laws of motion: the path followed by bodies descending along an inclined plane and along a curve, and the parabolic trajectory of projectiles.

Room II – Time and Space



Basically, longitude is calculated by measuring time and observing astronomical phenomena. Galileo tried to solve this problem by observing the motion of Jupiter's satellites and applying a pendulum to a mechanical clock. He determined the motion of the satellites – illustrated in real time by the Jupiterium created by Officine Panerai – by using an instrument of his own invention, called the "jovilabe." A touch screen lets visitors use this instrument virtually.
The operation of the pendulum clock is illustrated by an enlarged reproduction of the timekeeper designed by Galileo and by a mechanical model that compares Galileo's circular pendulum with the cycloidal pendulum. Very large models of escapements, which can be directly actuated, show how mechanical clocks operate.

Room III - Ancient Mechanical Clocks

Five ancient turret clocks (16th-18th centuries) with verge or anchor escapements and pendulum regulator are displayed here.

This room also features the spectacular working replica of the Planetary Clock conceived by Lorenzo della Volpaia (1446-1512) for Lorenzo the Magnificent (1449-1492) and completed in 1510 – one of the masterpieces of Renaissance mechanical clock-making. This clock was placed for many years in Palazzo Vecchio, first in the so-called Clock Room, then in the new Guardaroba, the room where Cosimo de' Medici began to collect the splendid mathematical instruments that formed the first core of the Medicean collection today on display at the Museo Galileo. The Planetary Clock got lost in the 17th century.

The working model exhibited in this room is based on the drawings of Benvenuto della Volpaia (1486-1532), the clockmaker's son, who followed in his footsteps.

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OFFICINE PANERAI AND MUSEO GALILEO: HISTORY OF A PARTNERSHIP

The sponsorship of the new interactive area devoted to "**Galileo and the Measurement of Time**" and the donation of the Jupiterium have together written the most recent chapter of the longstanding partnership between Officine Panerai and the Museo Galileo, a shared pathway based on a passion for history, research and science.

The alliance was forged in October 2008, when the exhibition entitled "**Galileo's Telescope. The Instrument that Changed the World**" opened at the Beijing Planetarium, an event promoted and organised by the Istituto e Museo di Storia della Scienza (Institute and Museum of the History

of Science, as the Museo Galileo was then called) and sponsored by Officine Panerai. The exhibition – staged for the International Year of Astronomy 2009 – aimed to make visitors aware of the revolutionary extent of the celestial discoveries made by Galileo thanks to his astronomical observations through the telescope.

Following the great success in Beijing – over 100,000 visitors in less than three months – the exhibition on Galileo's telescope was staged at the Franklin Institute in Philadelphia, one of the leading scientific museums in the United States. This time it was further enhanced by an extraordinary collection of original works from the Museo Galileo collections, which put Galileo's discoveries within the wider context of science during the time of the Medici. The exhibition "**Galileo, the Medici and the Age of Astronomy**" (April-September 2009) boasted over one hundred exhibits: artefacts, scientific instruments and works of art, including one of the two original telescopes belonging to Galileo, which on that occasion had left Italian soil for the very first time.

The show then travelled to the Nobel Museum in Stockholm (October 2009 – January 2010), where Galileo's other original telescope was displayed. On the occasion of the inauguration, Officine Panerai gave a world preview of the first of three timepieces created to celebrate the Tuscan genius: the planetary clock **Jupiterium**, the only instrument of its kind in the world to show the motion of the Sun, Moon, Jupiter and its satellites in real time as seen by an observer on Earth. The entire "**Tribute to Galileo**" was presented at the 2010 Salon International de la Haute Horlogerie in Geneva, where also **L'Astronomo** and **Lo Scienziato**, two models with tourbillon regulator, were displayed for the first time. Together with the Jupiterium, these two highly complicated timepieces form the trio dedicated to the Tuscan genius by Officine Panerai.

The partnership continued with the participation of the Museo Galileo in the event "**Time and Space – A Tribute to Galileo Galilei**", organised by Officine Panerai at the Ex3 Centre for Contemporary Art in Florence (September 2010) and at the Shanghai Sculpture Space in Shanghai (May 2011). On these occasions, the "Tribute to Galileo" stood as the culmination of an exhibition aimed at illustrating the history of the Panerai brand, through an extraordinary collection of historical and contemporary timepieces. These events were enriched by some instruments exceptionally loaned by the Museo Galileo, and by the lectures given by Professor Paolo Galluzzi, Director of the Museum, who enabled participants to fully understand the importance of Galileo's contribution to the history of science, and particularly to the measurement of time.