GALILEO GALILEI

BIOGRAPHY

BIG HISTORY PROJECT 780L
GALILEO GALILEI

THE FATHER OF MODERN OBSERVATIONAL ASTRONOMY

Born
February 15, 1564
Pisa, Italy

Died
January 9, 1642
Florence, Italy

By Cynthia Stokes Brown, adapted by Newsela
An Italian Renaissance man, Galileo used a telescope of his own invention to collect evidence that supported a Sun-centered model of the Solar System.
Galileo Galilei was born in Pisa, Italy, in 1564. He was the first of seven children. Galileo’s father was a musician — a lute player — from a noble background.

Galileo’s wish was to become a priest, but his father pushed him to study medicine. He attended the University of Pisa.

University courses at this time were based on Aristotle’s teachings. But Galileo made clever observations and began to question some of Aristotle’s ideas.

For example, Aristotle taught that objects of different sizes fall at different speeds. Galileo observed hailstones all hitting the ground at the same time. He decided Aristotle was wrong.

Is the Earth or the Sun at the center of it all?

Galileo became a professor of mathematics. He also gave private lessons in architecture, surveying, and mechanics. He also began studying tides, and became interested in astronomy.

Most scholars at this time still agreed with Ptolemy and Aristotle that all heavenly bodies revolve around Earth. Their view was called a geocentric model.

But other views were being considered. Nicolaus Copernicus claimed that all bodies revolve around the Sun. His was called a heliocentric model. Astronomer Tycho Brahe believed that Earth stayed still but other planets orbited around the Sun.

In 1597, Galileo read a book by German astronomer Johannes Kepler that argued for a heliocentric universe. Galileo wrote a letter to Kepler saying he agreed, but was keeping quiet. He didn’t want to be mocked for his ideas.

Galileo looks at the sky

Galileo observed a remarkable event in 1604, when a large star died in an explosion. It’s called a supernova.

Aristotle had said that no change could ever take place in the heavens. The supernova proved him wrong.

From then on, Galileo began to observe the sky. He performed experiments and made his own conclusions.

In 1609, the Dutch made an early telescope. A friend who saw it described it to Galileo. He reported that it had two lenses, one on each end of a 4-foot tube. Within about a month, Galileo had made a telescope three times as powerful as the Dutch device. Galileo continued to work on his telescope, making his own lenses.

Using the telescope, Galileo saw four moons orbiting Jupiter. This contradicted Ptolemy’s idea that the Earth is the center of all orbiting bodies.

Galileo published his findings in March 1610 as The Starry Messenger. The general public was excited by what he wrote. However, most philosophers and astronomers disagreed with Galileo. They said the moons weren’t really there.

Galileo stopped teaching and became a mathematician for the royal family in Florence. It was there that he began to observe Venus.

His observations demonstrated that Venus orbits the Sun. This proved Copernicus right and Ptolemy wrong. Galileo believed that the Earth also orbits the Sun, but he had not proved it yet.
The Inquisition targets Galileo

In the 16th century, the Catholic Church was facing many problems. Some people separated from the Church because of a disagreement and became Protestants. Printers in many European cities helped ideas spread quickly. Some of these ideas went against the teachings of the Catholic Church.

To fight the spread of these ideas, the Pope set up a system of courts. It was called the Inquisition.

In 1616, the Inquisition banned Copernicus’s book because it argued for a Solar System with the Sun at the center. The Church also banned Galileo’s book because he agreed with Copernicus.

Galileo traveled to Rome. He thought the Church was making a mistake that would hurt its reputation. He believed the Catholic Church should keep science and religion completely separate. The Church did not agree with Galileo. In the end, he agreed to obey the ban.

Galileo got permission from Pope Urban II to write a book, as long as he didn’t take sides in the Earth versus Sun debate. Galileo worked on his book for six years. In the book, one character argues for a heliocentric model, and another character argues for a geocentric model. The third character was a regular person, listening to both sides.

The book appeared in Florence in March 1632. In August, an order came from the Roman Inquisition to stop all sales. The Catholic Church felt that Galileo’s book was arguing for a Sun-centered model.

In September 1632, Galileo was charged with “heresy” — disagreeing with the Church. He was ordered to come to Rome for a trial.

Galileo tried to argue that his book showed both sides. Finally, he admitted that maybe the book leaned toward the Sun-centered argument. He was threatened with torture. He had to publicly admit he was wrong. His book was banned.
Timeline of Galileo’s life

1545–1563
Council of Trent: Roman Catholic Church resists Protestant movement, establishes Index of Prohibited Books

1564
Born on February 15 in Pisa, Italy

1570
1571
Astronomer and mathematician Johannes Kepler is born in Germany

1572
Spanish conquistadors execute the last Inca leader, Tupac Amaru, in Peru

1580
1581–1585
Studies at the University of Pisa

1587
Teaches at the University of Pisa

1588
England defeats the Spanish Armada

1590
1590
Teaches at the University of Padua

1600
1600
Kepler becomes an assistant to astronomer Tycho Brahe in Prague

1609
Kepler publishes the first two of his Laws of Planetary Motion

1610
Kepler publishes the first two of his Laws of Planetary Motion

During the time of Galileo
New Amsterdam (later New York) is founded by the Dutch West India Company in 1625.

Mount Vesuvius erupts near Naples, Italy in 1631.

French philosopher René Descartes publishes *Discourse on Method* where he states, “I think, therefore I am.” in 1637.

Galileo was crushed by the harsh verdict. The Inquisition put him under house arrest at his villa outside Florence. He suffered from many illnesses. A few months after his return home, his beloved, older daughter died.

The following year, Galileo’s book was published in France, outside the grasp of the Catholic Inquisition. This allowed his ideas to reach a wide audience.

Blindness and a legacy of truth

Galileo bounced back from these serious difficulties. In 1637, he wrote a book summarizing all his ideas. The book was translated into English, and Isaac Newton read it in 1666.

By 1638, Galileo had become totally blind. He wrote many letters by dictating them to others. He died on January 9, 1642, in Florence, at the age of 77.

It took the Catholic Church 200 years to lift the ban on Galileo’s book. In 1992, Pope John Paul II apologized for how the Church treated Galileo.

Galileo may be best remembered by his own self-reflection. Here is an adapted section of a letter he wrote about his blindness:

Well, your friend Galileo has been blind these last few months. Through my remarkable discoveries and observations, I have greatly expanded our past ideas of our Universe. But now, the whole Universe for me is shrunk down to my own sensations — what I can hear, touch, smell, taste...
Sources


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An undated portrait of Galileo
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An engraving of Galileo with his telescope
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