NICOLAUS COPERNICUS

BIOGRAPHY

BIG HISTORY PROJECT
A RENAISSANCE MAN WHO STARTED A SCIENTIFIC REVOLUTION

By Cynthia Stokes Brown, adapted by Newsela
In the middle of the 16th century, a Catholic, Polish astronomer, Nicolaus Copernicus, used observational data to diagram a Sun-centered view of the Universe. His work launched modern astronomy and set off a scientific revolution.
Have you ever heard the expression “Renaissance man?” The phrase describes a well-educated person who excels in a wide variety of subjects or fields. The Renaissance is the name for a period in European history, the 14th through the 17th centuries, when the continent emerged from the Dark Ages with a renewed interest in the arts and sciences. European scholars were rediscovering Greek and Roman knowledge, and educated Europeans felt that humans were limitless in their thinking capacities and should embrace all types of knowledge.

Nicolaus Copernicus was a true Renaissance man. He became a mathematician, an astronomer, a church judge with a doctorate in law, a physician, a translator, an artist, a Catholic cleric, a governor, a diplomat, and an economist. He spoke German, Polish, and Latin, and understood Greek and Italian.

Family and studies

Copernicus was born to wealthy parents in what is now Poland on February 19, 1473. Both his parents died when he was young. His wealthy, powerful uncle adopted him and his siblings.

Copernicus studied mathematics and astronomy at the University of Krakow from 1492 to 1496. He changed his last name, Koppernigk, to its Latin version while at the university, since scholars used Latin as their common language.

He also studied law at the University of Bologna and medicine at the University of Padua. It took two months to travel from Poland to Italy by foot and horseback, but the two schools in Italy were among the best in the world at that time.

As a student, Copernicus began to question what he was taught. He learned Aristotle’s and Ptolemy’s views of the Universe. Even though his professors believed that the Earth was at the center of the Universe and it did not move, Copernicus began to question those ideas.

Even as a young university student, there is evidence that Copernicus was beginning to envision a Universe where the Earth moved.

Copernicus returned to Poland in 1503, at age 30, to live in his uncle’s castle and serve as his secretary and physician. He stayed at this job, which gave him free time to continue his observations of the heavens, until 1510, two years before his uncle’s death.

Life as a canon

In 1497, Copernicus was elected canon of the cathedral in Frombork. Canons were responsible for administering all aspects of a cathedral. He had many duties as canon, including mapmaking, collecting taxes and managing the money, serving as a secretary, and practicing medicine.

He led a half-religious, half-secular life and still managed to continue his astronomical observations from his tower apartment. He conducted these with devices that looked like wooden yardsticks joined together, set up to measure the angular altitude of stars and planets and the angles between two distant bodies in the sky. He had a simple metal tube to look through, but no telescope had yet been invented.

By 1514, Copernicus had written a short report that he gave to his astronomy-minded friends. This report, called the Little Commentary, explained his heliocentric theory. In it, Copernicus confidently said that the Earth both revolved on its axis and orbited around the Sun.

A heliocentric theory

Copernicus worked on a detailed astronomical book for 16 years. He didn’t want to publish it because he was afraid of the huge controversy it would produce. He also hoped to gather more data.
Finally, in 1541, when he was 68, he agreed to publish it after a mathematician friend helped convince him. Copernicus gave his master work the title On the Revolutions of the Celestial Spheres.

In this work, Copernicus began by describing the shape of the Universe. He provided a diagram to help the reader. In the diagram, he showed the outer circle that contained all the fixed stars, much further away than previously believed. Inside the fixed stars were Saturn, then Jupiter, and Mars, then Earth, Venus, and Mercury, all in circular orbits around the Sun in the center.

He calculated the time required for each planet to complete its orbit, and was off by only a bit. Copernicus’s theory can be summarized like this:

The center of the Earth is not the center of the Universe, only of Earth’s gravity and of the Moon. The Sun is fixed and all other spheres revolve around the Sun. Copernicus kept the idea of spheres and of perfectly circular orbits. In fact, the orbits are elliptical, which the German astronomer Johannes Kepler demonstrated in 1609. Earth has more than one motion, turning on its axis and moving in a spherical orbit around the sun.

The stars are fixed, but appear to move because of the Earth’s motion.

Death and legacy

Legend has it that Copernicus, in a sickbed when his great work was published, awoke from a coma to look at the first copy of his book when it was brought to him. He was able to see and appreciate his accomplishment, and then closed his eyes and died peacefully, on May 24, 1543. He didn’t live to hear the praise or criticism of his ideas.

The Catholic Church waited seven decades to take any action against On the Revolutions of the Celestial Spheres. Why it waited so long has been the subject of much debate. In 1616, the church banned the book and any other work that defended the movement of the Earth. In 1633, Galileo Galilei was convicted of defying Church teachings for following Copernicus’s position.

Scholars did not generally accept the heliocentric view until Isaac Newton, in 1687, formulated the Law of Universal Gravitation. This law explained how gravity would cause the planets to orbit the much more massive Sun, and why the small moons around Jupiter and Earth orbited their home planets.

How long did it take for Copernicus’s ideas to reach the general public? Does anyone nowadays still believe the apparent evidence before their eyes that the Sun moves around the Earth to set and rise? Almost everyone learns in childhood that, despite appearances, the Earth moves around the Sun.

Copernicus’s model asked people to give up thinking that they lived in the center of the Universe. For him, the thought of the Sun illuminating all of the planets as they rotated around it had a sense of great beauty and simplicity.
Timeline of Copernicus’s life

1473  
Born on February 19 in Torun, Poland (then Thorn, West Prussia)

1474  
Copernicus’s father dies

1491-1503  
Copernicus studies at various universities in Poland and Italy

1492  
Columbus sails to the Americas

1487  
The War of the Roses ends in England

1503  
Leonardo da Vinci begins painting the *Mona Lisa*

1510  
Moves to Frauenburg (now Frombork)

1514  
Copernicus circulates his *Little Commentary*, introducing his heliocentric model

1517  
Martin Luther begins the Protestant Reformation in Germany

1520  
The Teutonic Knights raze Frombork; Copernicus and the other canons work to rebuild the town

1525  
Order of Teutonic Knights dissolves

During the time of Copernicus
Council of Trent: Roman Catholic Church resists Protestant movement, establishes *Index of Prohibited Books*

1542
Pope Paul III establishes Roman Holy Office of the Inquisition

1534
Pope Clement VII excommunicates Henry VIII of England

1543
Dies in Frombork on May 24, shortly after publication of *On the Revolutions of the Celestial Spheres*

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

Sources


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Copernicus’s view of the Solar System from the 1661
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