

A Brief History of the Life and Work of Nicolaus Copernicus¹

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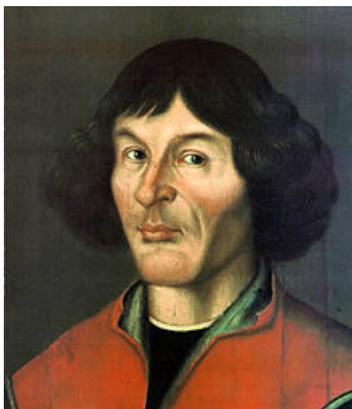
Abstract

This paper plans to celebrate Nicolaus Copernicus at 540 years from his birth. It makes part of the celebrations of important mathematical personalities and ideas, held each year at the Faculty of Mathematics and Computer Science of the Spiru Haret University.

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1. *Biography*



Nicolaus Copernicus (Mikołaj Kopernik) [4]

February 17, 1473 - May 24, 1543

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Copernicus was born in 1473 at Toruń in the Royal Prussia, part of the Kingdom of Poland.

He was the son of Nicolas Copernicus, a merchant from Krakow and of Barbara Watzenrode originar from an old family of Toruń.

At his father's death, in 1483, he is left to the care of his maternal uncle, Lukas Watzenrode.

In 1491, Copernicus enters the Academy of Krakow, where he studies *quadrivium* (arithmetic, music, geometry, astronomy) and *trivium* (grammar, rethorics, dialectics). He leaves the studies before obtaining his diploma.

In 1496, Copernicus goes to Bologna, where he studies at the university: cannonic law, civil law, medicine, philosophy and Greek.

At Bologna, he stays at the house of the astronomer Domenico Maria Novara, under whose guidance he makes his first astronomic observation: the star Aldebaran is covered by the Moon on March 9, 1497.



Aldebaran on the sky [6]

He continues his medecine studies at University of Padua.

In 1503, he obtains the title of philosophy doctor in law from the University of Ferrara, after which he returns to the cathedral in Frombrok, where he had been appointed canonical before he left to study.

Meanwhile, Copernicus's uncle had become bishop and Nicolaus would dwell in the bishop palace performing economic administrative duties and working as a physician.

Copernicus's first book (1509) is a translation into Latin from Greek of a book written by Theophylacte Simocatta (it is the first translation from Greek that was ever published in Poland).

At his uncle's death, Copernicus does not become bishop of Ermland, but continues his previous work.

Along the years, he fulfills various administrative positions, becoming in 1520 the military commander of Allenstein, when Ermland is occupied by the Teutonic Knights.

He arranges an astronomic observatory in the tower of the cathedral of Frombork and, supported by the observations he makes, he gets to consider the hypotheses of the heliocentrism instead of geocentrism.

Between 1511 and 1513, he writes *De hypothesibus motuum coelestium a se constitutis commentariolus*, manuscript he sends to his friends.

Pope Clement VII reads this paper and does not criticize it.

As he is a renown astronomer, his opinion is asked concerning the review of the calendar during the *Fifth Lateran Council*.

Around 1530, he finishes to write his main work *De revolutionibus orbium coelestium* (On the Revolutions of the Heavenly Spheres).

Before writing the definitive version, Copernicus sends Pope Paul III a draft of this book.

The paper gets to be printed only in 1543 in a Lutheran printing house, little before the author's death.

2. *Geocentric Systems*

Along the centuries, various models of geocentric systems have been proposed:

- Plato, Eudoxus of Cnidus, Heraclitus of Ephesus;
- Aristoteles proposes the division of the universe into two parts: the world below and the world above the Moon;
- Hiparchus of Nicaea, Apollonius of Perga introduce the concepts of deferent and epicycle;
- Ptolemy (II-nd century) introduces the concept of equant point;
- Tycho Brahe (1577) proves through the observation of a comet that the Aristotelian system does not stand.

3. *The Copernican Heliocentric System*

Based on his own observations, but taking into account the works of other astronomers, Copernicus states the hypotheses of a heliocentric solar system:

- The Sun is at the centre of the universe and all the planets revolve around it.
- The Earth is at the centre of the Earth-Moon system and it revolves around the Sun and rotates around an axis on the direction North-South.
- The planets have circular orbits, keeping a complex system that explains the movements of the planets using still the concepts of *deferent* and *epicycle*.



The Copernican solar system [1]

4. *The Relation between Heliocentrism and the Church*

"And the sun stood still, and the moon stopped, until the nation took vengeance on their enemies." (Bible: Joshua, 10:13; English Standard Version)

Copernicus did not have to suffer in any way because of his convictions during his lifetime.

In 1559, the Catholic Church creates the *Index*: all the books needed the Pope's and the Inquisition's authorization for publishing.

After 1610, Galileo Galilei starts to spread the heliocentric doctrine and in 1616 Copernicus's papers are passed to the Index.

In 1757, his papers are taken from the Index by Pope Benedict XIV.

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