

'ADALAH

Buletin Hukum & Keadilan

The Wild Theory of Nicolaus Copernicus

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Abstract:

Heliocentrism is one of the controversial theory which was found by Nicolaus Copernicus. This theory described that the Sun is the center of the universe and it was opposed to geocentrism, which placed the Earth at the center. This theory is contrary to the principles of the church and the contents of the Bible at that time. Some scientists oppose the formulation of Nicolaus Copernicus because it contradicts the principles of the church. Although he was in good standing with the Church. At this time, Copernicus was praised by many as the Father of Modern Astronomy. Indeed, his description of the universe was purified and improved by later scientists, such as Galileo, Kepler, and Newton. The controversy of the theory that was sparked by him made us aware of the fragility of scientific concepts that have been accepted for a long time. Through research, observation, and mathematics, Copernicus overturned a scientific and church concept that was rooted but was mistaken that the center of the solar system was the earth, an incorrect concept.

Keywords: *Heliocentrism, The Principles of The Church, Controversy*

Abstrak:

Heliosentrisme adalah salah satu teori kontroversial yang ditemukan oleh Nicolaus Copernicus. Teori ini menggambarkan bahwa matahari adalah pusat di alam semesta dan ia menentang geosentrisme, yang menempatkan bumi di tengah. Teori ini bertentangan dengan prinsip-prinsip gereja dan isi Alkitab pada waktu itu. Beberapa ilmuwan menentang perumusan Nicolaus Copernicus karena bertentangan dengan prinsip-prinsip gereja. Meskipun dia dalam posisi yang baik dengan gereja. Pada saat ini, Copernicus dipuji oleh banyak orang sebagai Bapak Astronomi Modern. Memang, uraiannya tentang alam semesta dimurnikan dan ditingkatkan oleh para ilmuwan kemudian, seperti Galileo, Kepler, dan Newton. Kontroversi teori yang dipicu olehnya membuat kita sadar akan kerapuhan konsep-konsep ilmiah yang telah diterima sejak lama. Melalui penelitian, pengamatan, dan matematika, Copernicus menjungkirbalikkan konsep ilmiah dan gereja yang berakar tetapi keliru bahwa pusat tata surya adalah bumi, sebuah konsep yang salah.

Kata Kunci: *Heliosentrisme, Prinsip-Prinsip Gereja, Kontroversi*

Prologue

There will always be debate and opposition to new theories that emerge. This indicates that humans want to continue to defend what they have learned before or because to believe in new things requires a complete explanation and accurate scientific evidence. It is home that is felt by one of the great scientists Nicolaus Copernicus. His discovery of the theory which states that the sun is the center of the solar system does not necessarily make him flattered and receive praise and acceptance from the people around him. The opposite is what he got was a tremendous opposition from the church and other scientists who thought what he concluded was very contrary to what they professed and learned earlier. Copernicus was not the first to conclude that the earth revolved around the Sun. Greek astronomer Aristarchus of Samos had put forward this theory in the third century BC. Followers of Pythagoras have taught that the earth and the Sun move around a central fire. However, Ptolemy wrote that if the earth moved, "animals and other objects would hang in the air, and the earth would fall from the sky very quickly". He added, "just thinking about those things just seems ridiculous". But even though that sounds ridiculous and does not make sense at the time. Nicolaus Copernicus as a scientist thirsty for science continued his research in the field of astronomies.

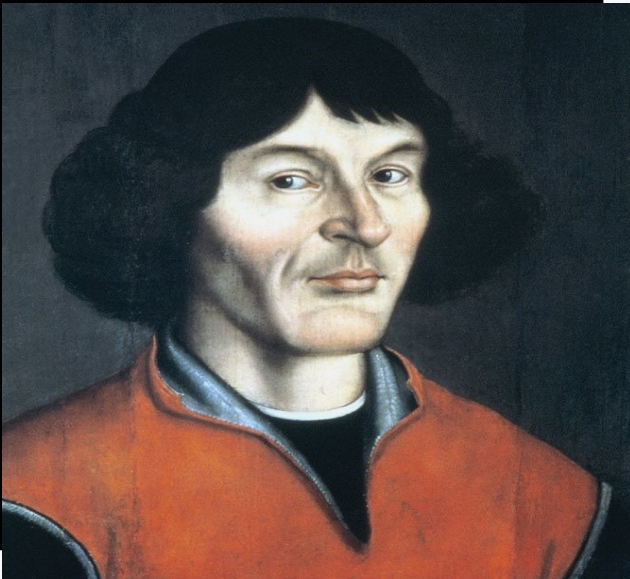
Who is Nicolaus Copernicus?

Nicolaus Copernicus was a Renaissance-era mathematician and astronomer, who formulated a model of the universe that placed the Sun rather than Earth at the center of the universe, in all likelihood independently of Aristarchus of Samos, who had formulated such a model some eighteen centuries earlier (Linton, 2004).

His book *De revolutionibus* was published just before his death in 1543, was an important event in the history of science, triggering the Copernican Revolution and making a pioneering contribu-

tion to the Scientific Revolution (Rosen, 1986).

Copernicus was born and passed away in Royal Prussia, a region that had been part of the Kingdom of Poland since 1466. A polyglot and polymath, he obtained a doctorate in canon law and was also a mathematician, astronomer, physician, classics scholar, translator, governor, diplomat, and economist. In 1517 he derived a quantity theory of money—a key concept in economics—and in 1519 he formulated an economic principle that later came to be called Gresham's law. He is one of the famous scientists who made controversy with his theory (Armitage, 1951).



Heliocentrism

Nicolaus Copernicus in his *De revolutionibus orbium coelestium* ("On the revolution of heavenly spheres", first printed in 1543 in Nuremberg), presented a discussion of a heliocentric model of the universe in much the same way as Ptolemy in the 2nd century had presented his geocentric model in his *Almagest*. Copernicus discussed the philosophical implications of his proposed system,

elaborated it in geometrical detail, used selected astronomical observations to derive the parameters of his model, and wrote astronomical tables which enabled one to compute the past and future positions of the stars and planets. In doing so, Copernicus moved heliocentrism from philosophical speculation to predictive geometrical astronomy. In reality, Copernicus's system did not predict the planets' positions any better than the Ptolemaic system (Henry, 2001).

This theory is controversial because this theory places the sun as the center of the solar system replacing the position of the earth

which has been believed to be the center of the solar system. What was conveyed by him in the heliocentric theory caused opposition especially from the teachings of the church who at that time believed that the center of the solar system was the earth, not the sun?

The first notable to move against Copernicanism was the Magister of the Holy Palace (i.e., the Catholic Church's chief censor), Dominican Bartolomeo Spina, who "expressed a desire to stamp out the Copernican doctrine". (Feldhay, 1995) But with Spina's death in 1546, his cause fell to his friend, the well-known theologian-astronomer, the Dominican Giovanni Maria Tolosani of the Convent of St. Mark in Florence. Tolosani had written a treatise on reforming the calendar (in which astronomy would play a large role) and had attended the Fifth Lateran Council (1512–1517) to discuss the matter. He had obtained a copy of *De Revolutionibus* in 1544. His denunciation of Copernicanism was written a year later, in 1545, in an appendix to his unpublished work, *On the Truth of Sacred Scripture* (Westman, 2011).

Emulating the rationalistic style of Thomas Aquinas, Tolosani sought to refute Copernicanism by philosophical argument. Copernicanism was absurd, according to Tolosani, because it was scientifically unproven and unfounded. First, Copernicus had assumed the motion of the Earth but offered no physical theory whereby one would deduce this motion. (No one realized that the investigation into Copernicanism would result in a rethinking of the entire field of physics.) Second, Tolosani charged that Copernicus's thought process was backward. He held that Copernicus had come up with his idea and then sought phenomena that would support it, rather than observing phenomena and deducing from them the idea of what caused them. In this, Tolosani was linking Copernicus's mathematical equations with the practices of the Pythagoreans (whom Aristotle had made arguments against, which were later picked up by Thomas Aquinas). It was argued that mathematical numbers were a mere product of the intellect without any physical reality, and as such could not provide

physical causes in the investigation of nature (Feldhay, 1995).

Tolosani may have criticized the Copernican theory as scientifically unproven and unfounded, but the theory also conflicted with the theology of the time, as can be seen in a sample of the works of John Calvin. In his Commentary on Genesis, he said that "We indeed are not ignorant that the circuit of the heavens is finite, and that the earth, like a little globe, is placed in the center." (Rosen, 1960) In his commentary on Psalms 93:1 he states that "The heavens revolve daily, and, immense as is their fabric and inconceivable the rapidity of their revolutions, we experience no concussion... How could the



earth hang suspended in the air were it not upheld by God's hand? By what means could it maintain itself unmoved, while the heavens above are in constant rapid motion, did not its Divine Maker fix and establish it." (Rosen, 1960) One sharp point of conflict between Copernicus's theory and the Bible concerned the story of the Battle of Gibeon in the Book of Joshua where the Hebrew forces were winning but whose opponents

were likely to escape once night fell. This is averted by Joshua's prayers causing the Sun and the Moon to stand still. Martin Luther once made a remark about Copernicus, although without mentioning his name. According to Anthony Lauterbach, while eating with Martin Luther the topic of Copernicus arose during dinner on 4 June 1539 (in the same year as professor George Joachim Rheticus of the local University had been granted leave to visit him). Luther is said to have remarked "So it goes now. Whoever wants to be clever must agree with nothing others esteem. He must do something of his own. This is what that fellow does who wishes to turn the whole of astronomy

upside-down. Even in these things that are thrown into disorder, I believe the Holy Scriptures, for Joshua commanded the sun to stand still and not the earth." (Donald dan Kobe 1998) These remarks were made four years before the publication of *On the Revolutions of the Heavenly Spheres* and a year before Rheticus' *Narratio Prima*. In John Aurifaber's account of the conversation Luther calls Copernicus "that fool" rather than "that fellow", this version is viewed by historians as less reliably sourced (Donald dan Kobe 1998).

Epilogue

To be a great scientist is not easy. There will be much opposition to what we find and propose. Time will prove to the world what we have stated because we cannot directly make them believe what we have discovered or described. As scientists, we must have patience and a high spirit to keep on trying to find new concepts that can increase the wealth of science. As scientists, we must have "wild" thinking to be able to discover and formulate new things even though the community around us or people around us might call us "fools or crazy" but that is the law of nature. Is this fair to scientists? There are even some scientists in the past who must be alienated, jailed, or even worse because of what they found. There is no profession without risk, opposition, storm, and sadness. All the positive or negative things that we experience will be extraordinary experiences that let us know that this is the world we live in.

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The Greek mathematician and astronomer Aristarchus of Samos proposed such a system during the third century BCE. (Dreyer 1953, pp. 135–48). Copernicus was aware of Aristarchus' heliocentric theory and cited him in an early (unpublished) manuscript of *De Revolutionibus* (which still survives), though he removed the reference from his final published manuscript.

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