

Biographical Encyclopedia of Astronomers

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Frisius, Gemma Reinerus

Born Dokkum, (Friesland, the Netherlands), 8 December 1508

Died Louvain, (Belgium), 25 May 1555

Gemma Frisius is mostly remembered as a mathematician, astronomer, cosmographer, and producer of globes

Until at least 1514, Frisius lived in Dokkum. Following the sudden death of his parents, he went to Groningen, where relatives took care of his education and schooling. Probably in the autumn of 1525, Frisius was sent to Louvain for higher studies. He entered the Lily and probably also took courses at the *Collegium Trilingue*. On 26 February 1526, Frisius matriculated at the Faculty of Arts, and two years later he was promoted to *Magister Artium*. In the years following this promotion, Frisius became known as the successful author of a series of cosmographical, astronomical, and mathematical treatises. For some time, he even worked exclusively as a mathematician. On 2 June 1534, he married Barbara, and in 1535 a son, Cornelius Gemma, was born

Frisius became a member of the University Council in 1535. He entered the Faculty of Medicine before August 1, 1536, and in 1541 was promoted to doctor of medicine, but he had already been given a public chair in medicine at Louvain University from 1537 onwards. In his occupation as a physician, he provided medical treatment to a noble and wealthy clientele, including Emperor Charles V. Frisius was never assigned a public chair of mathematics, but he gave private tuition in mathematics at his home. By April 1543, he had started a private course of mathematics primarily concerned with geometry and astronomy. In his *De Astrolabo*, Frisius also refers to private lessons on the use of astronomical instruments such as the *parallelogramic planisphaerium*. Gerhard Kremer mentions courses on the *theorica planetarum*. He continued teaching mathematics until at least 1547

Frisius enjoyed the support of the Court of Charles V. He was often consulted by the emperor, not only as a physician but also as an astronomer. The story goes that the emperor once pointed out a mistake on Frisius's 1540 map of the world, whereupon the mapmaker dedicated the map to him. Frisius could also rely on Johannes Dantiscus, who, as ambassador of the Polish King Sigismund I, resided at the court of Charles V from early 1531 until March 1532. Dantiscus became acquainted with Frisius, and when Dantiscus left Louvain in March 1532 and returned to Culm, he invited Frisius to come to Poland with him to meet Nicolaus Copernicus. However, for several reasons, Frisius never left for Poland.

Frisius's body of writings consists of a manuscript and a published part. The first part comprises his letters to Dantiscus and his annotations in his copy of Copernicus's *De Revolutionibus*. Several years before *De Revolutionibus* was published, Frisius knew about Copernicus's theory, as Dantiscus had informed him of it during his stay in the Low Countries in 1531/1532. The Copernicus copy with Frisius's annotations is preserved at the Provinciale Bibliotheek in

Leeuwarden, Friesland, and is the most extensively annotated copy of the 16th century. Frisius's interpretation of the heliocentric theory was not merely instrumentalist but realist as well, as is also shown by his posthumously published preface to Johann Stabius's *Ephemerides*. Here, Frisius explained that he preferred Copernicus's new theory not only because it offered more accurate predictions and showed a better agreement with observations, but also because it explained the phenomena, whereas Ptolemy's hypotheses could merely salvage them.

Among Frisius's published writings we find his reedition of Peter Apian's *Cosmographia* (Landshut, 1524), published in February 1529. In the editions of 1533, 1540, 1545, and 1548, Frisius made many significant additions to Apian's text. (For example, the addendum to Apian's chapter *De Ventis* discussed the problems of navigation and magnetic declination.) Until the end of the 16th century, the *Cosmographia* was considered a standard handbook of descriptive and practical geography and astronomy, and it went through numerous editions, reprints, and translations.

De Principiis Astronomiae et Cosmographiae, Deque usu globi ab eodem editi Item de Orbis divisione, & Insulis, rebusque nuper inventis (1530) was conceived as a commentary on a globe, and special attention was given to the simplification of astronomical observations and calculations, rather than to direct practical applications. The book consists of three parts dealing with, respectively, the principles of astronomy and cosmography (*De principiis cosmographiae*), the use of globes (*De usu globi*), and a descriptive geography of the Earth (*De orbis divisione*). The *De Principiis* also contains the first of Frisius's two most important discoveries: the determination of longitudes by means of the time difference between two different places. *The Libellus de locorum describendorum ratione et de eorum distantis inveniendis* (1533) served as a manual for topographical triangulation. Frisius explained how to establish the position of a place (longitude and latitude) in relation to other places and draw local maps by the means of trigonometry, following a method first developed by Jacob of Deventer in 1536.

In *Usus annuli astronomici* (1539), Frisius described the improvements he made to an instrument composed of a small portable equinoctial armillary sphere with three rings. He reduced the instrument to pocket size, the annulus astronomicus, popular until well into the 18th century, with movable rings for the horizon, equator, and ecliptic

In *De Radio astronomico* (1545), Frisius showed that he had already thoroughly read Copernicus' *De Revolutionibus* (1543). He clearly preferred the Copernican tables and his representation of lunar motion, compared with Ptolemy's, and he severely criticized the theory of homocentric spheres of Eudoxus, which Girolamo Fracastoro had tried to reintroduce in the 1530s.

The posthumous *De Astrolabo catholico* (1556) was conceived as a manual of the astrolabe that could be used at every latitude. It often repeated Frisius's preference for the Copernican parameters and also had a large section on astrology.

Fernand Hallyn and Cindy Lammens

Alternate name

Regnerus

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