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The Reception of Cosmography in Vienna:
Georg von Peurbach, Johannes
Regiomontanus, and Sebastian Binderlius

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The Reception of Cosmography in Vienna:

Georg von Peurbach, Johannes Regiomontanus, and Sebastian Binderlius¹

Abstract

In this paper, the importance of the cosmographical activities of the Vienna astronomical “school” for the reception of the *Tractatus de Sphaera* is analyzed. First, the biographies of two main representatives of the Vienna mathematical/astronomical circle are presented: the Austrian astronomers, mathematicians, and instrument makers Georg von Peurbach (1423–1461) and his student Johannes Müller von Königsberg (Regiomontanus, 1436–1476). Their studies influenced the cosmographical teaching at the University of Vienna enormously for the next century and are relevant to understanding what followed; therefore, the prosopographical introductions of these Vienna scholars have been included here, even if neither can be considered a real author of the *Sphaera*.

Moreover, taking the examples of an impressive sixteenth-century miscellany (Austrian National Library, Cod. ser. nov. 4265, including the recently rediscovered cosmography by Sebastian Binderlius, compiled around 1518), the diversity of different cosmographical studies in the capital of the Habsburg Empire at the turning point between the Middle Ages and the early modern period is demonstrated.

Handwritten comments in the Vienna edition of *De sphaera* (1518) also show how big the influence of Sacrobosco’s work remained as a didactical tool at the universities in the first decades of the sixteenth century—and how cosmographical knowledge was transformed and structured in early modern Europe by the editors and readers of the *Sphaera*.

Keywords: History of Renaissance cosmography, Georg von Peurbach, Johannes Regiomontanus, Vienna astronomical »school/circle« in the era of »integral humanism«, Sebastian Binderlius & Petrus Freylander.

¹ This research was done in the context of the project *The Sphere—Knowledge System Evolution and the Shared Scientific Identity of Europe* by Prof. Dr Matteo Valleriani. For further information on the project, see <https://sphaera.mpiwg-berlin.mpg.de>.

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1 Introduction

The impressive *Tractatus de sphaera* was written by Johannes de Sacrobosco around 1230 as part of his teaching activities at the University of Paris. Its reception in numerous early-modern commentaries, vernacular translations (Brévard 1979 and Crowther et al. 2015), and extended copies represents an accumulation of practical knowledge on elementary spherical astronomy and cosmography for more than five centuries (Gingerich 1990; Thorndike 1949). This important cosmological “bestseller” (Hamel 2006; Ludwig 2010)—reproduced in ca. 320 editions printed at 40 different locations from 1472 (Ferrara) until 1650 (Madrid)—was not only studied by interested Renaissance craftsmen and merchants, but notably by students of the quadrivium at universities all over Europe, where they were also commented on extensively.²

² The author of this text wants to thank Prof. Dr Matteo Valleriani and his project team (especially Christoph Sander, M.A.) for the kind invitation to participate in the *De sphaera*-project group as “visiting postdoctoral fellow.” During my stay at the MPIWG in Berlin-Dahlem (October 1, 2017–February 15, 2018), I already could use the Sacrobosco database (now open for the public: <http://db.sphaera.mpiwg-berlin.mpg.de/resource/Start>) for my research. This article is dedicated to Prof. Dr. Felix Schmeidler (1920–2008), who introduced me to the topic in Munich in 2005. It was only possible due to the financial help of the Portuguese Foundation for Science and Technology (FCT) and is strongly connected with my Postdoc research at the CIUHCT/FCUL in Lisbon about “Maps, Globes and Texts: Cosmographical knowledge in early Modern Europe” (FCT SFRH/BPD/85102/2012). Many fruitful discussions with my colleagues at the CIUHCT, in particularly Prof. Dr Henrique Leitão, Dr Samuel Gessner and Dr Luís Tirapicos as well as with Prof. Dr Thomas Paul Brysch (Viana de Castelo) enabled me to complete this study.

2 Astronomical Studies at the University of Vienna: Heinrich von Langenstein and Johannes von Gmunden

One of the oldest universities in the Holy Roman Empire north of the Alps is the University of Vienna, established by “the Founder” Duke Rudolf IV (1339–1365) and his two brothers, the Austrian Dukes Albert III (1349–1395) and Leopold III (1351–1386), on 12th of March 1365 (von Aschbach 1865, 1–42; Mühlberger and Niederkorn-Bruck 2010; Shank 2015, 184–90). But only with its reorganization in 1384, under the patronage of Albert III, was the “Alma Mater Rudolphina Vindobonensis” installed, containing its own university building in the “Stubenviertel” inside the city walls of Vienna (Kink 1854, vol. 1, 20–30; Shank 2015, 190–93; Uiblein 1985). At the same time, the faculty of theology was organized: The scholastic philosopher and mathematician Heinrich von Langenstein (Henry [Heinbuche] of Hesse the Elder, 1325–1397),³ who had studied and worked at the Sorbonne in Paris, accepted the invitation of the Austrian duke to teach there as a professor in 1384 (Sommerfeldt 1908, 292). The *Doctor conscientuosus*, who became rector of the Vienna university in 1393/1394, not only translated and published various theological texts;⁴ he also brought with him nominalistic and aristotelic-thomistic ideas as well as astronomical instruments (Grössing 1983a, 49, 71). He discussed and criticized the epicycle theory of the planets first presented by Ptolemy; however, he believed that the planets were embedded in solid crystalline spheres, although their motions were controlled by the sun. Furthermore, this scholar was strongly interested in astrology (Pruckner 1933; see also his *Quaestio de Cometa*, 1386) and even made astronomical observations at the tower of the *Collegium Ducale* in Vienna (Mühlberger 1996, 14).

Together with the Austrian mathematician and instrument maker Johannes von Gmunden (ca. 1384–1442), Langenstein can be seen as a representative of the first astronomical “school”⁵ in Vienna, which influenced the mathematical-astronomical studies in Europe for

³ (Tannstetter 1514, fols. aa3v–aa6v) names Henricus de Hassia Germanus in his *Viri Mathematica quos inclytum Viennense gymnasium ordine celebres habuit*, see also (Graf-Stuhlhofer 1996, 156–57).

⁴ However, the research by (Hohmann 1975, 235) shows that the direct participation of Langenstein in these attributive manuscripts has been overrated for a long time. See also (Kreuzer 1987).

⁵ This scientific term was invented by the German natural scientist Adam Wilhelm Siegmund Günther already in 1885. It was again used in the dissertation by Helmuth Grössing (Grössing 1983a) and various studies until today (Binder 1996). The term was criticized by (Shank 1985), but (Grössing 2012, 54) showed that one can indeed speak of a “school” when defining this term as a union of people with the same interests. It may be better in the future to use the term “mathematical/astronomical circle.”

nearly two centuries (Klug 1943; von Khautz 1755, 27–32, Simek and Klein 2012; Shank 2015, 195–203; Uiblein 1999). Johannes hailed from Gmunden in Upper Austria, where he was born around 1384. He received his Magister Artium at Vienna University in 1406 and lectured there from 1408 to 1412 and again from 1419 onwards. More than 600 Latin manuscripts document his voluminous opus and the “corpus astronomicum,” containing a compilation of planetary tables, calendars (reproduced with woodcuts), and instructions for the building of astronomical instruments (Chlench 2006; Kren 1983; Firneis 2006), that he used didactically in his courses. Johannes was able to restrict his teaching to the specialized field of the mathematics of astronomy. This is why *De Sphaera* as well as the Ptolemaic opus played a significant role in his lectures on the *Theorice Planetarum* (1420 and repeated in 1422 and 1423; directly excerpted from the Italian astronomer Campanus of Novara (died 1296) (Benjamin 1954), on the *Sphaera materialis* (1425), and on the use of the astrolabe (1434) (Lhotsky 1965, 154; Kunitzsch 2008).

John Mundy summarized that von Gmunden “did not appreciably add to the basic knowledge provided by his sources, but, by adding and changing tables to suit the longitude and latitude of Vienna, he made them demonstrable [i.e., used them for didactic purposes] and so made them part of the scientific apparatus of Central Europe” (Mundy 1943, 199). In the canon Johannes von Gmunden (elected at St. Stephans Cathedral in 1425) one recognizes the first link to humanism in Vienna (Lhotsky 1965, 153–62). This is impressively documented in many astronomical and mathematical manuscripts in the Austrian National Library (Grössing 1983b).⁶

⁶ For the first links to humanism, see especially the astronomical miscellany (Cod. 5266), composed in Klosterneuburg in 1429, which also contains circular schemata of the planetary movements (Shank 2015, 200–1).

3 Georg von Peuerbach

Georg Aunpekh, a native from Peuerbach in Upper Austria (1423–1461), matriculated at Vienna University four years after the death of Johannes von Gmunden. We do not know much about his early scholastic education, but it is most likely that the priest of his hometown, Dr. Heinrich Barucher, recognized the extraordinary talent of the young scholar and in the early 1440s brought him in contact with the Augustinian provost of Klosterneuburg Monastery, Georg Muestinger (died 1442), a friend of Gmunden who was extremely interested in cartography (Grössing 1983a, 79; Samhaber 1999, 41).⁷ At the University of Vienna, Georg attended his first lecture about the *Theoricae Planetarum*, which was taught by the Benedictine Magister Johannes (also from Peuerbach).⁸

On 2nd of January 1448, Georg received his bachelor's degree in Vienna and traveled afterwards through Italy giving lectures on astronomy, mainly at the universities of Padua,⁹ Bologna, and Ferrara, where he met the leading Italian astronomer of the day, Giovanni Bianchini (1410–ca. 1469). It is also documented that he visited Rome in 1450, where he probably became a friend of the important German philosopher and Prince-Bishop of Brixen Nikolaus von Kues (Nicolaus Cusanus, 1401–1464) (Meuthen 1983, 666, Nr. 961; Samhaber 2000, 50–61).¹⁰ As a legate, Cardinal Cusanus had made a long journey through the German

⁷ Under the direction of Muestinger, the so-called 'Klosterneuburg Fridericus Map' was produced using more than 700 polar coordinates, which can be found in (Codex Latinus Monacensis/Clm 14583) at the Bavarian State Library in Munich. See (Durand 1933; 1952, 56–61; Horst and Brunner, 2012) and the reappraisal by (Gautier Dalché 2009, 180–83).

⁸ For a complete list of all 74 students at Vienna coming from Peuerbach in the years between 1401 and 1500, see (Mühlberger 2002, 168–70). Sacroboscus *Sphaera* circulated at that time in various manuscripts, as a copy demonstrates that was made around 1440 in the Benedictine monastery in Mondsee and today is preserved in the Austrian National Library (Cod. 4778, fols. 284r–330r).

⁹ Fifteenth years later, in 1464, Peuerbach's student Regiomontanus gave an inaugural oration (*Oratio Johannis de Monteregio habita Patavii in praelectione Alfragani*, printed 1537 in Nuremberg by Johanne Schöner) about the astronomy of al-Farghani at the same university (Schmeidler 1972, XIV–XVI, 43–53; Byrne 2006). Therein, he praised the studies of his teacher, who had strongly influenced the astronomy of his time (Samhaber 1999, 47–62). On the relationship between the two astronomers, see also (Grössing 1980a).

¹⁰ Another piece of evidence for this connection is a letter which Peuerbach wrote to Johann Nihil Bohemus in 1456; therein, one reads, "Judicium cometis domini Nicolai nondum habeo, id tamen habiturus prope diem sum, quod ad vos mittam" (Czerny 1888, 302–3; Wallner 1947, 38–40). It is also possible that Peuerbach came in contact with the Florentine mathematician Paolo dal Pozzo Toscanelli (1397–1482), as a letter from Cusanus to Toscanelli with *De Quadratura circuli dialogus* suggests, "Detur venerabili nostro fidelio dilecto magistro Georgio Peurbachio astronomo" (Grössing 2002, 3; Schmeidler 1972, 430).

lands in order to conduct a reform in the monasteries.¹¹ It is most likely that in the wake of his “Great Legation,” Georg travelled back to Vienna, where Cusanus was welcomed at the university by its rector, Thomas Ebendorfer von Haselbach (1388–1464), on 1st or 2nd of March 1451 (Meuthen 1996, 764–67, Nr. 1068).

Georg was awarded there with the Magister Artium on 28th of February 1453.¹² In the following year, he was appointed as court astrologer¹³ for the young King Ladislas V of Bohemia and Hungary (Ladislaus “the Posthoumous”; 1440–1457), who resided primarily in Prague and Vienna, allowing Georg to maintain his position at the University of Vienna. After the death of Ladislas, Georg served as *Astronomus caesaris*¹⁴ for the Holy Roman Emperor Frederick III (reigned 1452–1493), a position which he held until his death on 8th of April 1461 in Vienna. At the imperial court of Wiener Neustadt, Georg quickly made contacts with early humanists (Großmann 1929, 245–50), gathering around the secretary in the imperial chancery, Eneas Silvio Piccolomini (1405–1464), who in 1458 was elected as Pope Pius II. In fact, it was Eneas who negotiated the marriage between Frederick III and the Portuguese Infanta Leonor (Eleanor of Portugal, 1436–1467), which took place on 16th of March 1452 in Rome (Horst 2017, 10). Before this event, around 1450, a horoscope for Leonor was ordered (*Judicium Johannis de monte regio super nativitate imperatricis Leonorae, uxoris imperatoris Friderici III*). It is preserved in two codices of the Bavarian State Library (Clm 453, fol. 78r–85v; Clm 960, fol. 11r–20v) (Schmeidler 1972, XI–XII, 2–33), the older originating from the library of the Nuremberg humanist Hartmann Schedel (1440–1514), who identified it as an autograph of a student of Peuerbach, Johannes Müller von Königsberg, better known as Regiomontanus (1436–1476). But it would be rather strange to assign this responsible task to a fourteen-year-old boy who had only arrived in Vienna in spring 1450.¹⁵ This is why we suppose that this horoscope was

¹¹ Altogether, Cusanus visited 277 places in Germany and the Netherlands in 456 days (31st of December 1450–5th of March 1453), see (Meuthen 1995).

¹² Vienna University Archive (Acta facultatis artium, Vienna 1453, fol. 65v). Afterwards, Georg was allowed to give lectures about the Roman Poets Horaz and Juvenal in Vienna, see (Pfändtner 2007, 124).

¹³ Due to the help of the former astrologer of the king, Johannes Nihil Bohemus (died ca. 1457/1458), see also his letter (written in Wiener-Neustadt in 1453) to Peuerbach and edited in (Czerny 1888, 289–92). Grössing (1983a, 105, 265–66) mentions that according to the correspondence with Bohemus (Czerny 1888, 298), we also know that Peuerbach made excerpts of a cosmography together with a map.

¹⁴ For the dedication of the *Epitoma in Almagestum*, see (Schmeidler 1972, 60).

¹⁵ After the birth of Maximilian I (1459–1518) another horoscope was made by Regiomontanus, see (Bues 1984, 30; Hayton 2010, 43).

probably made in cooperation with Peurbach, who at least acted as an agent (Grössing 1983a, 81, 86–91; Hack 2012, 149).

In the following years, when Georg also gave astronomical lectures at the “Bürgerschule” (*Collegium Civium*) of St. Stephan, the “Gothic humanist” (Grössing 1985, 38–39; Grössing 2002, 9) was very productive as a mathematician,¹⁶ astrologer,¹⁷ astronomer,¹⁸ instrument maker,¹⁹ and poet,²⁰ publishing a variety of different studies.²¹

¹⁶ We attribute to him not only arithmetical (e.g., the adoption of precise sine panels into astronomy) but also trigonometrical studies, which also allowed him to construct innovative instruments; see also (Kern 2010, 107).

¹⁷ (Grössing 1983a, 107–8; 2002, 6) mentions also the production of calendars and blood-letting papers (*cedulae minuciorum/Aderlaßzettel*). It is important to mention that Peurbach distinguished between legal and unauthorized astrology.

¹⁸ In 1456, Halley’s Comet appeared on the sky and was observed by Peurbach on the nights of the 9th/10th and 13th/14th of June, who reported on it to the arts faculty (Austrian National Library, Cod. 4756, fols. 20r–25r), see (Großmann 1965/1966, 206–16). In line with the Aristotelic tradition, he regarded comets not as celestial bodies, but as meteorological phenomenon. He is the first scholar who tried to estimate the size of the comet and its distance to the earth (Lhotsky and d’Ochieppo 1960, 290). Peurbach also published annual astronomical year-books (*Ephemerides*), a work with many tables, continued by Regiomontanus from 1475 to 1506 (Schmeidler 1972, XX–XXI, 535–64; Malpangotto 2008, 55–56) and especially by the astronomer Johannes Engel (died 1512, also: Johannes Angelus) (Grössing 1986; Bennett and Bertoloni Meli 1994, 18–19, cat. no. 4) in Vienna (1510 and 1512); see also (Dobrzycki and Kremer 1996). Moreover, in 1514, Georg Tannstetter published the *Tabulae eclipsium* of Peurbach together with his *Viri Mathematici*, where he lists more than 20 works by him (Tannstetter 1514, fols. aa3v–aa4r; von Khautz 1755, 45–57).

¹⁹ In 1451, Georg constructed a sundial for St. Stephan’s Cathedral. A special portable sundial, which he invented (*horologia locabilia*), bearing the compass (including the magnetic declination) and the motto „AEIOU” of Frederick III is preserved in the Tiroler Landesmuseum Ferdinandeum in Innsbruck (Inv. No. U 5); a later one (made of brass) can be found in the Steiermärkische Landesmuseum Joanneum in Graz (No. 4525). But Georg also constructed other instruments, such as astrolabes (1457, today at the Germanisches Nationalmuseum in Nuremberg, Inv. No. WI 129) (Samhaber 2000, 196–97, 242–43), three theoretical studies (*Compositio Quadrantis Astrolabii*, *Usus Varii Super Astrolabio* and *Canones Astrolabii*), armillary spheres, and a *Quadratum geometricum* (for height determination; see Grössing 1983a, 102–7; Samhaber 1999, 68–73; Zinner 1938/1990, 19–20). It is also possible that he built a *Sphera Solida* (celestial globe) in Buda (Grössing 2002, 27–29).

²⁰ In 1458, Georg, who wrote Latin poems in elegiac and heroic meters and taught at the university about Roman poets (namely on Virgil’s Aeneid in 1454 and 1460 and the Juvenal in 1546), defined the *positio et determinatio* of poetry and so also did philologic studies (Grössing 1985, 38).

²¹ A complete list of his publications can be found in (Graf-Stuhlhofer 1996, 158–59; Grössing 1983a, 107–16).

4 A Revised Edition of the Ptolemaic Almagest and a New Theory of the Planets

In 1460, Cardinal Basilius Bessarion (died 1472) (Mohler 1923), an erudite Platonist and student of the Greek humanist Georgios Gemistos Plethon (died 1452),²² was sent to Vienna by the Pope with the diplomatic mission to discuss the dangerous threat from the East (Fall of Constantinople, 1453).²³ On this occasion, Bessarion met with Austrian scholars and convinced Georg to undertake the preparation of a new abridgment of Ptolemy's *Syntaxis Mathematica*, the *Almagest* (Aiton 1987, 5). This work was mainly known to the astronomers of the fifteenth century in its Arabic versions and its Latin translation, made around 1175 by Gerard of Cremona (ca. 1114–1187).²⁴ The revised edition of the original Greek text was planned to receive a new translation,²⁵ as Bessarion thought that a shorter and more clearly written version of the opus would make a suitable teaching text.

Peuerbach accepted the task (even though his knowledge of the Greek language was not sufficient) and worked on it—together with Regiomontanus—until his death, at which time six volumes had been prepared. The project was completed by his student in 1462 (the final version comprises 13 volumes): the *Epytoma Joannis de Monte Regio in Almagestum Ptolemei* was printed in Venice in 1496 for the first time; its front page shows Ptolemy on the left and Regiomontanus on the right, sitting under an armillary sphere (Figure 1) (Heitzmann 2008, 46–48, Nr. 14; Shank 2015, 208–9). Therein one can also find current research of the Vienna astronomers by adding later observations, revised computations, and critical reflections.²⁶ The

²² Plethon, who stood in the tradition of Platonism, presented during the Council of Florence (1438–1439) the contradiction between Aristotle and Plato. He was also interested in geography and introduced the antique geography of Strabo to the West (where it had hitherto been unknown). This indirectly played a role in the discovery of America (Anastos 1952; Diller 1947; Goldstein 1965).

²³ Bessarion looked for support in a crusade to reclaim Constantinople from the Turks.

²⁴ Peuerbach possessed a copy, which can be found in the Austrian National Library (Cod. 4799). On the Arabic translations of the *Almagest* and the Latin translations based on these, see (Kunitzsch 1974, 11–112). In general, see (Pedersen 2010).

²⁵ The only existing Latin translation of the *Almagest*, made by the Greek humanist (and Bessarion's philosophical rival) George of Trebizond (1396–1485), was considered unsatisfactory, as it was inaccurate and badly translated: see (Schmeidler 1972, XVI).

²⁶ Particularly concerning the failure of Ptolemy's lunar theory to represent the appearances, see (Aiton 1987, 6) and the facsimile-edition by (Schmeidler 1972, 55–274).

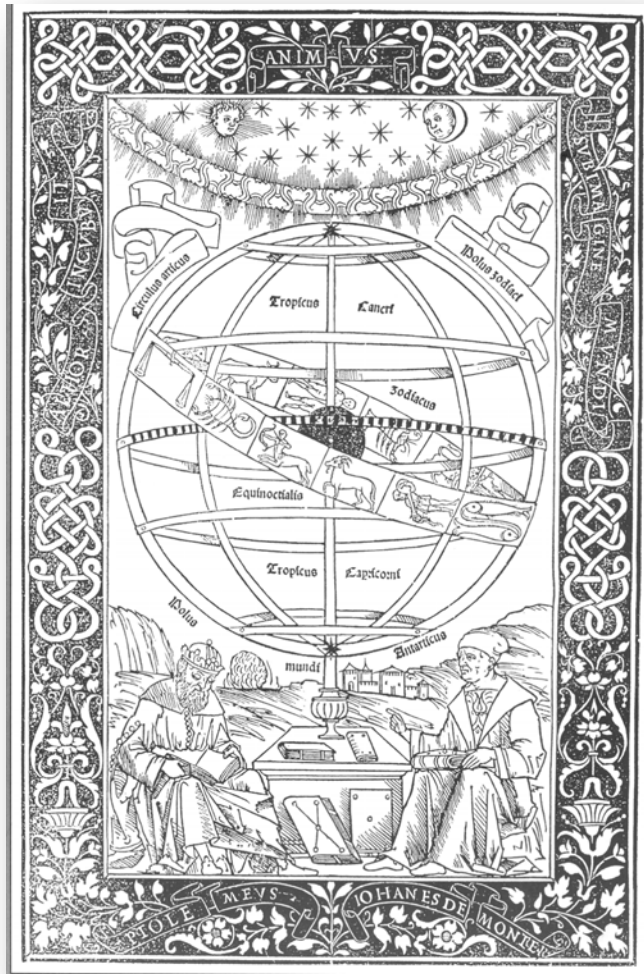


Figure 1: The title cover of the 1496 Venice print *Epytoma Joannis de Monte Regio in Almagestum Ptolemei* shows Ptolemy on the left and Regiomontanus on the right, sitting under an armillary sphere. Incunable, printed by Iohannes Hamann de Lundoid. From (Samhaber 2000, 119).

1990, 22), and so broke with medieval ideas and contributed fundamentally to pre-Copernican astronomy (Grössing 2002, 24).²⁸

²⁷ This work is generally ascribed to Gerard of Cremona, but we have no evidence to back this up (Pedersen 1981). The standard introduction to theoretical astronomy provides the reader with astronomical knowledge needed for the study of the *Canones*, the *Alfonsine Tables* and other astronomical treatises (such as those of al-Battani and al-Farghani) (Bennett and Bertoloni Meli 1994, 12–13, cat. no. 1).

²⁸ As (Malpangotto 2016) has shown, Albert of Brudzewo (1445–1497), an eminent figure at Cracow University, adopted Peurbach’s text together with a *commentariolum* of his own. This commentary eventually led Copernicus to the motion of the earth and the heliocentric theory (Barker 2013). On the celestial orbs from Peurbach

outcome of this study was a whole new planetary theory, which later served as a starting point for the new conception of the universe proposed by Copernicus (Zinner 1943/1988; Hassinger 1950, 28–30). Peurbach’s *Theoricae novae planetarum* is based on a series of lectures given by him in the *Collegio Civium* in 1454. It was designed to replace the popular medieval *Theorica Planetarum* (written by a thirteenth-century author)²⁷ while introducing his students (with *De sphaera*) to spherical astronomy and astronomical cosmography at the beginning of the Renaissance (Nothaft, 2019). In fact, Georg did not propound a new theory, as he did not break with the prevailing Ptolemaic ideas and still was lodged in scholastic traditions; but he considered new views, especially on the

precession of the equinoxes (Zinner

The original autograph of the *Theoricae novae planetarum* is unfortunately lost, but in the Austrian National Library in Vienna (Codex 5203, fols. 1r–24r) survived the earliest copy in a calculation-book, written by Regiomontanus on 30th August 1454.²⁹ In the following years, more manuscript copies (and commentaries) had been written, including one illustrated version for Cardinal Bessarion in 1460 (Malpangotto 2012a, 369–78).

The first printed edition of the text was published around 1473 in Nuremberg (Karthäusergasse) (Figure 2), where Regiomontanus established his own printing workshop (Schmeidler 1972, 753–93). The new planetary theory was divided into nine chapters, dealing with the sun, the moon, *De Draconae lunae*, *De tribus superioribus*, the planets Venus and Mercury, *De passionibus planetarum diversis*, declination and latitude, and finally the motion of the eighth sphere (Pedersen 1984, 164).

This opus (together with 29 illustrating figures/geometrical diagrams, e.g., of the planet Mercury) (Malpangotto 2013; Pantin 2012, esp. 6; Shank 2015, 205) had a broad diffusion over centuries throughout Europe: it can be found altogether in fifty-six editions³⁰ from around 1473 to 1653 (Samhaber 2000, 247–48), and even was translated into French (Oronce Fine: *La theorique des cielz, mouvemens et termes pratiques des sept planètes*, first published in Paris in 1528 and again in 1557, 1607, and 1619), into Hebrew (1546), and into Italian (Oratio Toscanella, 1566). It is interesting to see that Peuerbach’s original text was often bound

to Copernicus, see (Barker 2011); on his astronomic activities, see (Carmody 1951; Shank 1998). For a re-examination of the great reputation of Peuerbach and Regiomontanus in general, see (Thorndike 1929, 142–50).

²⁹ The text (Austrian National Library, Cod. 5203, fol. 24r) ends: “finiunt Theoricae novae per magistrum Georgium de peurbach edite anno domini 1454 Wienne in Collegio civium penultima mensis Augusti.” For a description of this manuscript, see also (Folkerts 1980, 176–86; 1990, 366–67; Malpangotto 2012a, 344–46; Nothaft 2019). In the printed version (1472), a section on Thabit ibn Qurra’s theory of trepidation was added (by Regiomontanus?), see (Aiton 1987, 6; Grössing 1983a, 95–102, 110). The miscellany also contains *De reprobatione eccentricorum et epicyclorum* by Heinrich von Lagensteins, wherein the *Theorica* is criticized (Shank 2015, 210).

³⁰ Among them, we have to highlight the printed commentaries by Albert of Brudzewo (1495), Johannes Capuanus (1495, 1499, 1503, 1508, 1518), Erasmus Reinhold (1542, 1553, 1555, 1558, 1562, 1580, 1601, 1604, 1653), Oswald Schreckenfuchs (1556), Philipp Imsser (1556), and Pedro Nunes Salaciense (1566, 1573); see (Aiton 1987, 7).

together with Sacrobosco's *Sphaera* from 1482 to 1537³¹ (see appendix)³² and that it was printed in the workshop of the cosmographer Peter Apian (1495–1552) in Ingolstadt.³³ Both treatises contain various hand-colored diagrams,³⁴ making astronomy visible and vivid, well suited for use as didactic tools for the teaching of early modern students (Table 1).³⁵

Figure 2: Title cover of Peurbach's *Theoricae novae planetarum*, published in the Nuremberg printing press by his student Regiomontanus around 1473. The diagram demonstrates the theory of the solar system. From (Peurbach [ca. 1473], fol. 17r). Bavarian State Library Munich 2°Inc. s. a. 1010, urn:nbn:de:bvb:12-bsb00030432-6.



³¹ In an edition of the *Sphaera* that was published in 1508 in Venice (<http://doi.org/21.11103/sphaera.100915>), the commentary of the Italian astronomer and bishop Francesco Capuano di Manfredonia (died ca. 1490) to Peurbach's texts was for the first time printed in a compendium and became very popular; see also the re-visions with the same annotations in 1518 (<http://doi.org/21.11103/sphaera.101057>), 1531 (<http://doi.org/21.11103/sphaera.100999>), and 1583 (<http://doi.org/21.11103/sphaera.101101>). Compare also Angela Axworthy's book project on this topic (forthcoming).

³² The appendix at the end of this paper lists altogether 18 treatises of the *Sphaera* that were published together with the commentaries by Peurbach or/and Regiomontanus in the years between 1482 and 1629.

³³ Compare the versions from 1528 and 1537 (Bennett and Bertoloni Meli 1994, 83, cat. No. 47–48). On the printing press of the cosmographer Peter Apian, see especially (Schottenloher 1930).

³⁴ (Crowther and Barker 2013; Gingerich 1988; 1999). A detailed study of the diagrams in the printed reception of *De sphaera* has yet to be done—a topic which now could be realized easier with the help of the database at the MPIWG. For astronomical and cosmological diagrams in medieval manuscripts, see (Müller 2008, 203–51, 253–71).

³⁵ A list of documented 20 lectures at Vienna University about *Theoricas Planetarum* given between 1472 and 1511 can be found in Table 1.

5 Johannes Regiomontanus and his astronomical works

A closer connection between the natural sciences and humanism can be seen in the age of the Renaissance astronomer Regiomontanus (1436–1476), who was active in Italy and Hungary.³⁶

Johannes Müller was born on 6th of July 1436 in Königsberg in Lower Franconia, ca. forty kilometers away from Bamberg in the Haßberge hill chain. He later latinized his name after this little town into *Monte Regio* (thus Regiomontanus).³⁷

At the age of only eleven, he was already (1447–1450) a student at the University of Leipzig in Saxony (founded 1409). There he computed (using the Alfonsine Tables) his *Ephemerides* (astronomical daily position tables for the planets for the years 1448 to 1463) (Austrian National Library, Cod. 4988).

On 15th of April 1450, *Johannes molitoris de kunigsperg* matriculated at Alma Mater Rudolphina in Vienna. He graduated there with the Magister Artium three years later³⁸ and began collaborating extensively with Peurbach in his astronomical and mathematical works.³⁹

In September 1461, only a few weeks after the death of Peurbach (6th of July 1476), Regiomontanus left Vienna; he had been invited to accompany Bessarion on his journey to Italy. Due to the illness of the cardinal, they only arrived in Rome in November. There, Regiomontanus could continue his studies on Ptolemy in Bessarion's voluminous library: with 482 Greek and 264 Latin manuscripts, this was the largest private library in Europe at the time!

In the following years, Regiomontanus traveled (as a member of Bessarion's household) around Northern Italy (Grössing 1980b; Rigo 1991), where he made the acquaintance of the leading Italian mathematicians Paolo dal Pozzo Toscanelli and Giovanni Bianchini in Ferrara,

³⁶ For biographical information about Regiomontanus, see (Bues 1984; Hamann 1980; Malpangotto 2008, 21–31; Mett 1996; Zinner 1938/1990). His importance as an astronomer is also highlighted by (Swerdlow 1990).

³⁷ Johannes was born probably in the small village Unfinden near Königsberg. It was the German Lutheran reformer Philip Melanchthon (1497–1560) who used the name *Regiomontanus* in the preface of the *Liber Iohannis de Sacro Busto, de Sphaera*, printed in 1531 in Wittenberg by Joseph Klug (1490–1552), see <http://doi.org/21.11103/sphaera.100138>. According to the database, in total 85 books of the *Sphaera* also include an excerpt of the third book of the *Epitome* of Ptolemy's *Almagest*, starting with Sacrobosco's edition of 1531 (Hamel 2014, 101, No. 81) until the Wittenberg edition of 1629, which was printed by the heirs of Zacharias I. Schürer (1600–1626), see <http://doi.org/21.11103/sphaera.100303> and (Hamel 2014, 132, No. 220).

³⁸ Regiomontanus received his degree on 28th of February 1453, but as he was too young, he only was included in the arts faculty at the age of twenty-one, on 11th of November 1457. There he gave lectures on optics (1458), ancient literature, and the first book of Euclid.

³⁹ Both scholars observed celestial phenomena (such as lunar eclipses) to correct the astronomical tables (*Tabulae eclipsium*): see (Bennett and Bertoloni Meli 1994, 22–25, cat. No. 6).

with whom he corresponded scientifically in 1463 and 1464 (Gerl 1989).⁴⁰ In 1464, he also met the Polish astronomer Martin Bylica of Ilkusch (ca. 1433–1493), who served as an astrologer at the curia and followed him later to Hungary (Hayton 2010).⁴¹ In this period, Regiomontanus is known to have constructed astrolabes⁴² and solar clocks,⁴³ to have given a lecture about *De scientia stellarum* at the University of Padua,⁴⁴ and to have established the basis for modern spherical trigonometry with his *De Triangulis Omnimodis Libri Quinque* (printed in Nuremberg in 1533) (Hughes 1967; Malpangotto 2008, 36–40; Schmeidler 1972, XVII–XIX, 275–413).⁴⁵ In 1467, Johannes accepted an invitation from the Hungarian humanist János Vitéz (John Vitéz de Zredna, ca. 1408–1472, archbishop of Esztergom starting in 1465), who had founded a new university (*Universitas Istropolitana*) in Preßburg (today Bratislava) and had installed an astronomical observatory in his palace. During his stay in Hungary (1467–1471), Regiomontanus calculated (together with Martin Bylica) extensive astronomical tables (such as the *Tabulae directionum et profectionum* for the calculation of horoscopes and finding astrological houses, printed in 1490 by Ratdolt in Augsburg)⁴⁶ and built astronomical instruments (a big astrolabe and a torquetum) (Horst 2019b; Strohmeier and Wolfschmidt 1976, 46–47; Zinner 1956, 177–83).

⁴⁰ In his second letter (December 1453), Regiomontanus mentions three of his works, which are connected: The *Tabulae Primi Mobilis* (Malpangotto 2008, 49–51), its description in the *Canones* (both printed in Vienna in 1514) and his explanatory statement *Fundamentum Operationum* (only printed in Neuburg an der Donau in 1557). A fourth study, the *Problemata Almagesti* (containing thirteen books), is lost (Bues 1984, 33–34; Schmeidler 1972, XVII).

⁴¹ Here began a fruitful collaboration (Markowsky 1973, 134). They jointly developed astronomical tables and the *Disputationes inter Viennensem et Cracoviensem super Cremonensia in planetarum theoriae deliramenta*, a critical discussion between himself and his friend Martin Bylica about an obsolete astronomical book. Bylica also became the official astrologer of Matthias Corvinus in spring 1468. Later, the Bavarian astronomer Johannes Tolhopff (died 1503), who offered his *Stellarium* (1480, about the movements of the planets) to the ruler of Hungary, worked in Buda. See (Heitzmann 2008, No. 16, 54–56).

⁴² On the astrolabe, which he presented for Cardinal Bessarion in 1462, see (King and Turner 1994).

⁴³ (Bues 1984, 36) mentions a horseshoe-shaped solar-clock, that can be found in the Germanisches Nationalmuseum in Nuremberg (Inv. No. W 17).

⁴⁴ This was a brief introduction to astronomy by the Arabic writer al-Farghānī (Alfraganus, 800–870). We only have the inaugural oration by Regiomontanus on all the mathematical sciences (Malpangotto 2008, 42–43, 129–46; 2012, 109–14; Swerdlow 1993, 142–66)

⁴⁵ For his mathematical works in general, see (Folkerts 1977; Glowatzki 1990; Kaunzner 2002; Malpangotto 2008, 69–124; Schmeidler 1980); on the instruments of his time compare the exhibition catalogue by (Strohmeier and Wolfschmidt 1976).

⁴⁶ These tables were meant to allow astrologers to predict the future based on one's date of birth (Bennett and Bertoloni Meli 1994, 32–44; Malpangotto 2008, 51–52).

In 1467/1468 he stayed at the court of the Hungarian and Croatian king Matthias Corvinus (reigned 1458–1490) in Buda (Cermann 2014),⁴⁷ where he also observed the planets and compiled his *Tabulae primi mobilis*.

On behalf of the king, Regiomontanus went to the Free City of Nuremberg in Franconia to get in contact with other astronomers (Lindgren 2002; von Stromer 1980).⁴⁸ He arrived there between 15th of March and 2nd of June 1471 (Bues 1984, 38). Together with the Nuremberg merchant Bernhard Walther (1430–1504), Regiomontanus observed the comet of 1472, which was visible for fifty-nine days. In Nuremberg he also founded his own printing press, the first ever printing house dedicated to the printing and publishing of scientific books (Eisenstein 1979, 586–87), where he printed around 1473 the *Theoricae novae planetarum* of his teacher Georg von Peurbach (including 29 mathematical figures). We still have the editorial program (1473/1474) of the works planned to be published in this workshop (Haebler 1929, 8–10; Shank 2015, 210–11),⁴⁹ but unfortunately Regiomontanus could not complete all his interesting projects. However, in his printing press there were published successfully much sought-after calendars⁵⁰ as well as a pamphlet against the planetary theory of Gerard of Cremona, which Regiomontanus had already finished in summer 1464 (Schmeidler 1972, XIX, 513–30): The illustrated dialogue (with diagrams) between a fictitious astronomer from Vienna (himself) and his friend from Cracow (Malpangotto 2008, 155–62) is known as *Disputationes contra deliramenta Cremonensia* and has been printed altogether in eighteen editions (Shank

⁴⁷ In Buda, the Austrian instrument maker Hans Dorn also worked (died 1509); he created a celestial globe in 1480 (Ameisenowa 1959; Samhaber 2000, 252–53; Zinner 1956, 292–97).

⁴⁸ On 29th of November 1471, Regiomontanus was accepted by the council to live in the Free City of Nuremberg until Christmas 1472 (Bues 1984, 39). However, it is doubtful if Regiomontanus also established an observatory in Nuremberg; Felix Schmeidler always claimed that he only used portable instruments.

⁴⁹ It bears the title *Hec opera fient oppido Nuremberga Germaniae ductu Joannis de Montereio* and lists altogether 29 books of other authors and 22 personal works, including maps (Bagrow 1947) and instruments. From these planned projects only nine were published by his own printing press (Schmeidler 1972, XX, 533; Malpangotto 2008, 147–54). Zinner (1938/1990, 59) could not find any traces or references to maps made by Regiomontanus himself, but it is sure that he had contacts with German scientists (such as Donnus Nicolaus Germanus) and book printers living in Rome, where the first Ptolemy atlas (with maps) was published by Arnold Bucking in 1478.

⁵⁰ As blockbooks in the German language (Zinner 1937). As an example, see the incunable at the University Library of Erlangen (Cim. M 17).

2012)—often bound together with the new planetary theory of Peurbach and Sacrobosco’s *Sphaera* (starting in 1482).⁵¹

We need to emphasize here that neither Peurbach nor Regiomontanus ever commented on Sacrobosco’s treatise. In fact, their new and intensive astronomical works were intended to replace the *Tractatus de Sphaera* (Heitzmann 2008, 47).

In summer 1475, Regiomontanus was called to Rome by Pope Sixtus IV (reigned 1471–1484) to give expert advice on the planned calendar reform (Reich 1990, 355). On his way to the Holy City, stopping in Venice, he commissioned his publication of his *Kalendarium novum*, which was printed in the following year by the Augsburg book printer Erhard Ratdolt (1442–1528, active in Venice 1476–1486) (Malpangotto 2008, 55; Redgrave 1894).

But it all came to naught, since Regiomontanus died only a few months after his arrival in Rome, at the age of only forty-one, on 6th of July 1476.⁵² It was Bernhard Walther who bought all his books and observation devices in Nuremberg, where he continued observing the planets and eclipses until he died in 1504. The results of these observations were published only four centuries later, in a 1544 print by the Franconian polymath Johannes Schöner (1477–1547).

⁵¹ See in the appendix at the end of this article, listing altogether eighteen treatises of the *Sphaera* that were published together with the commentaries by Peurbach or/and Regiomontanus in the years between 1482 and 1629.

⁵² The rumour that Regiomontanus has been poisoned by relatives of his contrahend George of Trebizond is not very credible, as we know that at the time of his death, a pestilent epidemic (as result of a flooding) spreaded in Rome. Moreover, this gossip only arised decades after his passing.

6 Cosmographical activities in Vienna in the era of “integral humanism”

The diversity of cosmographical activities in Vienna can especially be followed in the sixteenth century, when humanistic science was transformed locally into the so-called “integral humanism.” Grössing (1983a, 12, 25–28, 44–45) denotes with this term the period between ca. 1500 and ca. 1550, emphasizing the local phenomenon in Vienna that combined the quadrivium with humanistic methods. Even if this term should not be generalized, we think that for the peculiar case of Vienna it is of relevance.

This can be shown by reference to an impressive opus in the Austrian National Library: Cod. ser. nov. 4265.⁵³ This miscellany contains in total thirty-seven manuscripts and printed works dealing with multiple treatises, which were bound together (as its book cover suggests) and to which numerous marginalia were added during the Renaissance.

The elaborated astronomical/cosmographical compendium contains inter alia a manuscript text by the prior at the *Collegium ducale* in Vienna, Sebastian Binderlius (died ca. 1528, also called Bunderl, Winderl, Winderlin),⁵⁴ who contributed—as did fellow students like the Swiss scholar Joachim von Watt (Joachim Vadian, ca. 1484–1511) (Gamper 2017)—not only with a poem for the Vienna edition of Peurbach’s eclipse tables and the *Tabulae Primi Mobilis*, edited by Georg Tannstetter (Collimitius, 1482–1535) in 1514 (Tannstetter 1514),⁵⁵ but also with two orations published on the occasion of the First Congress of Vienna (1515).⁵⁶ Both scholars,

⁵³ The miscellany was bought in Munich from the antiquariat Rosenthal in 1905. For a detailed description see (Mazal 1975, 132–39).

⁵⁴ Binderlius (from Gallneukirchen, a small village in Upper Austria), matriculated at the University of Vienna in 1512 and was a student of the famous humanist Georg Tannstetter (Collimitius, 1482–1535) (Göhler 1932, 506 [No. 320]; Graf-Stuhlhofer 1996). The author of this article plans to publish an article about his biography separately. First findings on Binderlius have already been presented at the “Österreichische Gesellschaft für Wissenschaftsgeschichte” (Austrian Society for the History of Science) on 12th of May 2016 in Vienna (ÖGW Res Novae IX/April 2016, 9; online available via http://wissenschaftsgeschichte.ac.at/files/resnovae/09_2016.pdf; accessed: 26 February 2019).

⁵⁵ This book was printed by Johannes Winterburger (died 1519) (Reske 2015, 1047–48), who had a printing workshop in Vienna starting in 1492. The preface of this print was written by the astronomer, mathematician, and theologian Andreas Stiborius (Andreas Stöberl, 1464–1515), who also was concerned with the reform of the calendar (Graf Stuhlhofer 1996, 125–28). Stiborius used for his lectures in Vienna “foregrounded instruments in both his own teaching and in the practical tasks of astrologers and physicians” (Hayton 2015, 73, 96): “His students included some of the most important instrument makers of the sixteenth century.” Among them can be found Peter Apian (1495–1552), Georg Hartmann (1489–1564), and Johannes Werner (1468–1522).

⁵⁶ The ORATIONES VIENNAE AVSTRIAE ad Dium MAXIMILIANVM Caes. Aug. alios[que] illustrissimes Principes, habitae. In celeberrimo trium Regum ad Caes. conuentu. Anno. M.D.XV. (Vienna: Hieronymus Vietor, Leonhard & Lukas Alantsee, 1516) contain two orations by Binderlius, which were already completed on 25th of June 1514

Binderliius and Vadian, also compiled two unknown cosmographical manuscripts around 1518, which were probably used as didactic tools for their teaching at Vienna University:

- (1) the *Cosmographiae introductorium compendiarium tum utile non sine elegantia ex illustribusque quibusque autoribus Cosmographiae concinne congestum* by Binderliius⁵⁷ deals mainly with cosmographical topics, but—in the tradition of Sacrobosco—astronomy plays a role here as well;
- (2) the *Introductorium sive Epithome in Geographiam* (Cod. ser. nov. 4265, fols. 251v–264v, 309v–310r) on the other hand, written by Vadian in twenty-six chapters and preserved in two versions (Horst et al. 2018, 55–56), which was used for teaching in St. Gall before 1521, predominantly treats geographical questions.

That is why it is worth having a closer look at the first manuscript, as it is probably directly linked to the reception of *De Sphaera* in “integral humanism” in Vienna and so can indirectly give us information about the early-modern readers of the *Sphaera*.

6.1 The cosmographical introduction by Binderliius (1518/1519)

As the *subscriptio* of the text tells us, the cosmographical introduction by Binderliius was finished on the *duocecimo kalen[dis] Septem[bris]* (21st of August 1518) and written by the *conventore Burse agni Vienne*, Magister Petrus Freylander.⁵⁸ Contrary to this date, another copy of the text, which is preserved in a contemporary miscellany in the Zentralbibliothek in Zurich (Druckschriften RY 318,6 fols. 39r–67r), is dated *Tertii Calendas Martii* (27th of February

(for Mary from Hungary, 1505–1558) and on 24th of February 1515 (for Cardinal Matthäus Lang von Wellenburg, 1468–1540).

⁵⁷ (Cod. ser. nov. 4265, fols. 202r–29v), rediscovered recently by (Horst 2019a).

⁵⁸ (Cod. ser. nov. 4265, fol. 229v). Petrus Freylander (also: Freylender) came from Wolfsberg in Carinthia and is firstly named in the (Acta Facultatis Artium IV) on 8th of April 1506, when he was accepted for determination at Vienna University: see (Maisel 2007, 93 [24379/b-22]). In winter-semester 1511, he was obliged as a magister to read about *De sphaera* (ibid., 137 [25500/p-54]). Until 1523, he gave diverse cosmographical courses at the university, where the “*Libri Posterioris*” and the “*Sphaera materialis*” (1516), see (Maisel 2007, 151 [26017/p-33], 162 [26444/p-26]), the “*Parva Logicalia*” (1517), see (Maisel 2007, 168 [26655/p-18]), the “*Liber Physicorum*” (1518), see (Maisel 2007, 171 [26772/p-16]), the “*Liber de celo et mundo*” (1519 & 1520), see (Maisel 2007, 178 [27010/p-17], 184 [27214/p-17]), and the “*Perspectiva communis*” (1523), see (Maisel 2007, 195 [27525/p-9]) were taught. In the 1516 print, Freylander also contributed with an oration for Christopherus Rauber (died 1536, the second Bishop of Laibach/Ljubljana). For an overview of the students’ houses (*bursae*) in Vienna, see (Mühlberger 1993).

1519).⁵⁹ As both miscellanies also contain the printed Vienna 1518 edition of the *Opusculu[m] de Sphaera clarissimi philosophi Ioannis de Sacro busto*,⁶⁰ we need to take a closer look at its contents.

The cosmographical text of Binderlius starts with a short poem and contains altogether ten chapters with various illustrations and tables. In the preamble of the text, the aim of the opus becomes apparent: it is not a compilation, but rather an independent work. Binderlius tried to introduce the reader to the cosmos. In doing so, he moves from the macro- to the microcosm. He first informs us about the seven planets (including the twelve signs of the zodiac) and describes the position of the earth in the center of the cosmos (*de Sphere Axe Centro & Polis*) (Figure 3).⁶¹ Then Binderlius introduces the circles of the sky (*de circulis*): the equator, the polar circles, the tropics of cancer and but also visualized with small diagrams how classical ideas (for instance the new geographical knowledge in the Age of Discovery—a contemporary question which goes much beyond Sacrobosco.

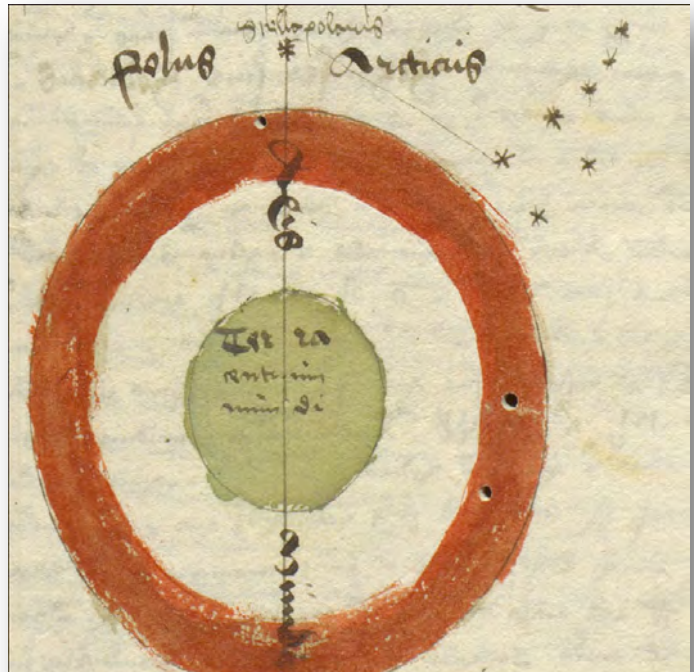


Figure 3: Sketch in the Zurich copy of the cosmographical introduction by Binderlius, showing both celestial poles and the axis of the cosmos dividing the earth. From (*Catullus* [1514], fol. 41r), Zürich Central Library, Ry 318,6, <http://doi.org/10.3931/e-rara-13393> / Public Domain Mark.

capricorn and the zodiac are not only described (Horst et al. 2018). Furthermore, it is shown question of unaccessible antipodes) diverge with

⁵⁹ My investigations led me finally to a third, seventeenth century copy of the cosmographical text, located in the University Library in Berne (ZB Inc. V 106, fols. 1r–37r), see (Horst et al. 2018, 56).

⁶⁰ Printed by Johann Singriener and Lukas Alantsee. Listed also in the appendix of this article.

⁶¹ This is illustrated with a colored sketch in the Zurich copy, showing both celestial poles and the axis of the cosmos dividing the earth. One can clearly see the stars of the *Ursa Major* as reference points here. In the copies in Vienna and Berne, which are both uncolored, this scheme is in each case upside down.

The third chapter of the cosmography deals with parallel circles (*de Parallelis*):⁶² Since Antiquity, the seven climates (Honigmann 1929) were the essential part of each geographical description of the world, so it is no surprise that *de climatib[us]* introduces us to the classical climatic zones here.⁶³ This is followed by a description of the winds (*de Ventis*), which are illustrated with a classical wind rose showing twelve directions and surrounding the vignette of an imaginary city (Figure 4) (Horst et al. 2018). Unfortunately, the short text of the sixth chapter (*Quemadmodum hec o[mn]ia de quib[us] hactenus dict[um] e[st] in Typis Cosmographicis et num[er]is & aliis rep[er]antur*) is very fragmentary. Afterwards, Binderlius discusses the size of the terrestrial sphere (*de Universe Terre magnitud[in]e et me[n]sura*) and mentions both data for the circumference of the earth, the one given by Eratosthenes (252.000 stadia) and the 180.000 stadia by Poseidonius, which were also used by Ptolemy. The next chapter, *Partitio terra[e] habitate in suas partes proprias*, speaks about the division of the habitable earth into three continents (Asia, Europe, and Africa) and is illustrated with an ordinary T-O-Map (oriented already to the north). In *quomo[do] milliariu[m] int[er] duo loco magnum emat[us]*, numerous coordinate tables of selected geographical places (listing

⁶² The length of the longest days increases from the equator to the polar circle. Each latitude is defined by a specific length of the day. In the *Geographike Hyphegesis*, Ptolemy lists 21 polar circles, see (Stückelberger and Mittenhuber 2009, 232–34).

⁶³ Binderlius refers not only to the Latin grammarian Gaius Julius Solinus (third century) but also to Alexander the Great.



Figure 4: The fifth chapter of the *Cosmographiae introductorium* by Binderlius is illustrated with a classical wind rose showing twelve directions and surrounding the vignette of an imaginary city. From (Binderlius [ca. 1519], fol. 216v). Austrian National Library, Cod. ser. n. 4265.

their geographical latitude and longitude) are given, while the last chapter (*de oceano et que ab eo mariam terra[m] infindunt[ur]*) deals with the ocean and the seas.⁶⁴

As the titles of the chapters indicate, this cosmographical text was only partially influenced by Sacrobosco's *Sphaera*, which probably was used for the astronomical parts at the beginning. Nevertheless, this text needs to be seen in the context of teaching cosmography in Vienna: while focusing on the microcosm and geographical topics, the introduction even complements the *Tractatus de sphaera*.

This is impressively documented in the Zurich miscellany: Here one can see a handcolored map of the hemisphere, illustrating the text of Binderlius with the outline of the continents (Figure 5). The model of this illustration can be found in the same miscellany (Druckschriften RY 318,5): It comes from the only Sacrobosco edition to be printed in Vienna (by Johannes

⁶⁴ For example, it is discussed whether the Caspian Sea is an inland sea or not (Horst et al. 2018, 57).

Singriener for Leonhard Alantsee in 1518), out of which this exact graphic was cut; but it is also available in the Vienna miscellany, which even bears additional handwritten notes (referring inter alia to the habitable and inhabitable zones) (Figure 6a & b). The prototype of this illustration can be found on the cover of the not so well-known cosmographical treatise *Der welt kugel. Beschrybu[n]g der welt und deß ga[n]tze[n] Ertreichs*, which was printed by Johann Grüninger in Strasbourg in 1509 (Figure 7). This print, which also exists in a Latin version (*Globus mundi. Declaratio siue descriptio mundi et totius orbis terrarium*) of the same year, was compiled by the German cartographer Martin Waldseemüller (died 1520) and published with a small print run ([Waldseemüller] 1509). It serves as an important link for the transfer of cosmographical knowledge between tradition and modernity in the Age of Discovery (Lehmann 2013, 88) and needs to be seen together with the production of his gores for a terrestrial globe in 1507 and his famous world map of the same year (Horst 2009, 24–25; Lehmann 2011).⁶⁵

Figure 5: In the Zurich copy of the Cosmographiae introductorium, a colored map of the hemisphere illustrates the cosmographical text of Binderlius—taken from (Horst et al., 2018, fig. 18). Original from (Catullus [1514], 58r), Zürich Central Library, Ry 318,6, <http://doi.org/10.3931/e-rara-13393> / Public Domain Mark.

⁶⁵ Waldseemüller was a student of Gregor Reisch, a German Carthusian writer (died 1525) who was one of the famous representatives of scholastic Realism.

Figure 6a & b: This map also appears in the Vienna edition of the *Opusculu[m] de Sphaera* clarissimi philosophi Ioannis de Sacro busto (1518), out of which it was probably cut in the Zürich miscellany (image on the right) and used as a model for Figure 5. From (Catullus [1514], fol. Diii), Zürich Central Library, Ry 318,6, <http://doi.org/10.3931/e-rara-13393> / Public Domain Mark and from (Binderlius [ca. 1519], fol. 136r). Austrian National Library, Cod. ser. n. 4265.

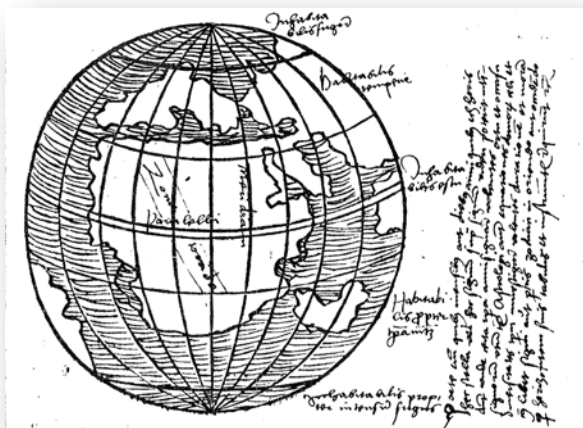




Figure 7: The model of this hemispherical map (Figure 5 and Figure 6a & b) can be found already on the title page of Waldseemüller's description of the *Globus mundi* (Strasbourg, 1599). German version: *Der welt kugel. Beschrybu[n]g der welt und deß gā[n]tze[n] Erreichs*. From ([Waldseemüller] 1599, fol. 1). Bavarian State Library Munich Rar 1482, urn:nbn:de:bvb:12-bsb00004842-7.

6.2 A humanistic compendium with cosmographical treatises in Vienna: Cod. ser. nov. 4265

The *Cosmographiae introductorium* of Binderlius is part of an extensive miscellany, which contains numerous marginal notes on various books (mostly printed by the same printing houses) and probably belonged to the Vienna scholar Petrus Freylender, who is listed in the “Acta Facultatis Artium” from 1506 to 1523. A closer analysis of this compendium could help us understand how cosmography was defined in the era of “integral humanism” in sixteenth-century Vienna.

Moreover, with the help of the diverse texts in Cod. ser. nov. 4265, we are now able to reconstruct which books were used at the university for teaching the quadrivium, especially cosmography. Besides the handwritten introduction by Binderlius, the following parts of the miscellany can be highlighted here, even if not all of them deal with cosmography:

- (fols. 2r–69v): the codex starts with the philosophical text of the *Naturalia* by the famous German philosopher Albertus Magnus (died 1280). The first pages (including the title page and a poem by Vadian) of this print, which was published by Johannes Singriener for Leonhard Alantsee in Vienna on 13th of December 1514 (Alantse 1514; Denis 1782, 115–16, No. 120),⁶⁶ are missing. At its end, on fol. 69v, a handwritten *Vita Alberti* describes the life of the “*doctor universalis*.” This could be a clue that the commentator on the text, who could be identified as Magister Petrus Freylender (compare his subscription on fol. 229v), probably sympathized with the “*Via Antiqua*.”⁶⁷
- (fols. 70r–77v): In 1513, Peurbach’s *Institutiones in Arithmetica* was printed in Nuremberg by Johannes Weyssenburger (Peurbach 1513).⁶⁸ With this algorithm, the

⁶⁶ A collection of the works by *Alberti Magni Germani principis philosophi* (together with poems by Vadian and Binderlius) was printed by Hieronymus Vietor and Johannes Singriener only a few days before. See (Denis 1782, 104–5, No. 111).

⁶⁷ The University of Vienna was predominated since its founding by the “*Via Moderna*,” i.e., nominalism. But the end of the fifteenth century also witnessed the entrance of realism and there were even “plans for funding a house for realists (*bursa realisitarum*) should there be enough students” (Gabriel 1974, 458); see also (Bauch 1903, 94–116, esp. 96–97; Uiblein 1974, 68–69) and Vienna University Archive (Acta Facultatis Artium IV, fol. 10r–11r [8th of August 1499]), transcribed by (Maisel 2007, 18–19). However, as (Ritter 1963, 121) has shown, the so-called “*Wegestreit*” (Hoenen 1995; Oberman 1987) played only a secondary role for the composers of cosmographical textbooks in Vienna—at least in the period around 1520!

⁶⁸ This work was for the first time edited in Vienna two years earlier by Johannes Marius Rhetus. It was printed by Hieronymus Vietor and is described in (Denis 1782, 59, No. 63; von Khautz 1755, 53; Samhaber 2000, 249).

students could learn the basics of algebra (addition and multiplication). In this print, a former reader notes at the beginning that he has heard a lecture about the *Algorithmus* in 1518 by Magister Petrus Grienbald (“*Algorithmus auditus [...] Anno d[omi]ni 1518 a m[a]g[ist]ro Petro Grienbald*”) and has even detected an error on fol. 73r: four multiplied by eight gives 32 and not 34! Furthermore, on the title page (fol. 70r), Freylander has added short biographical information about the life of Peurbach: “*Floruit hic Georgius Peurbachius Vienne A[nn]o Friderico 3 ro[manorum] im[peratorum] patre Maximiliani fuitq[ue] p[rae]ceptor Joannis de monte regio. Quor[um] utriq[ue] sue etat[is] p[rae]stantissim[us] fuit Mathematicus qui natur[am] finem fecit sexto id[us] Aprilis anno 1461.*”

- (fols. 80r–83v): In 1512, Hieronymus Vietor (ca. 1480–1546) (Reske 2015, 1048–49), who was a joint partner of Johann Singriener from 1510 to December 1514 and later became a famous printer in Cracaw (Buřhak 1990; Świerk 1976), published in Vienna the *Algorithmus linealis* (Denis 1782, 78, No. 80). This miscellany contains a second version of the text by an itinerant teacher from Lübeck, Johannes Cusanus (Cusanus 1514; Denis 1782, 116, No. 121). At the end of this, mathematical print Freylander has again added numerous handwritten marginal notes (about *Temporis species*, the measurement of times, on fol. 83v).
- (fols. 84r–94v): The *Computus nouus [et] ecclesiasticus totius fere Astronomie fundamentu[m] pulcherrimum co[n]tinens. Clerico no[n] minus vtilis qua[m] necessarius: cum additionibus quibusdam nouiter apressis* informed the students about the principles of chronology. This astronomical/calendrical treatise, which goes back to a primary version of Petrus de Cracovia (printed 1487/88 in Leipzig), was reprinted many times: The present print seems to be the only existing copy of this Vienna edition,⁶⁹ which was published by Hieronymus Vietor and Johann Singriener in 1517 and once again bears many manuscript notes.
- (fols. 96r–104v): This is a small manuscript handbook with astronomical pen drawings, showing among other things the solar circle (*circulis solaris*), the *littera dominicales*,

⁶⁹ The version that appeared there in 1513 by Hieronymus Vietor and Johannes Singriener (Denis 1782, 78, No. 92) is well known, which is not the case for the version of 1517 (Denis 1782, 176, No. 186), which is bound together into this miscellany.

and the *Typus totius universi*, representing the cosmos with its spheres (Figure 8). The *rota* reveals the conjunction; and further information about the calendar is given to the reader here.

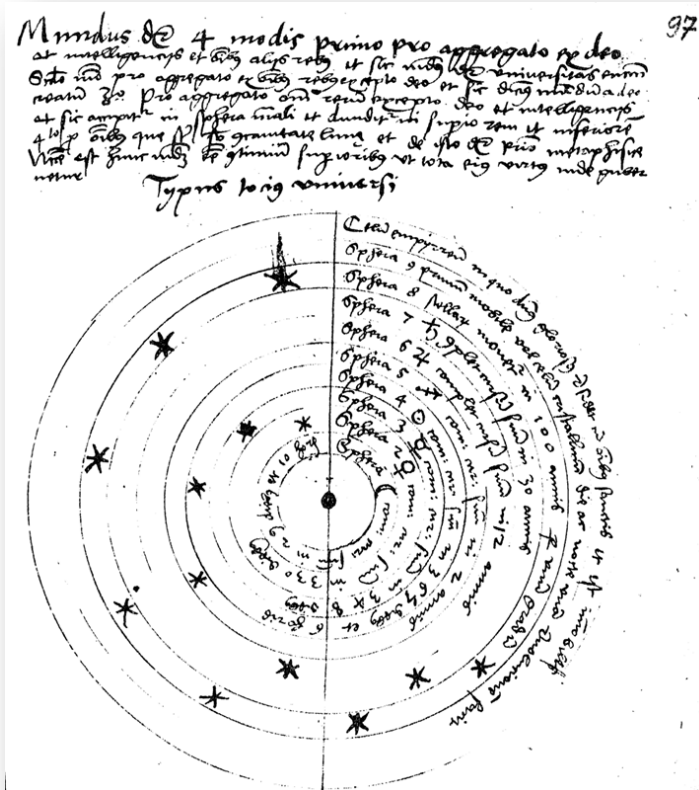
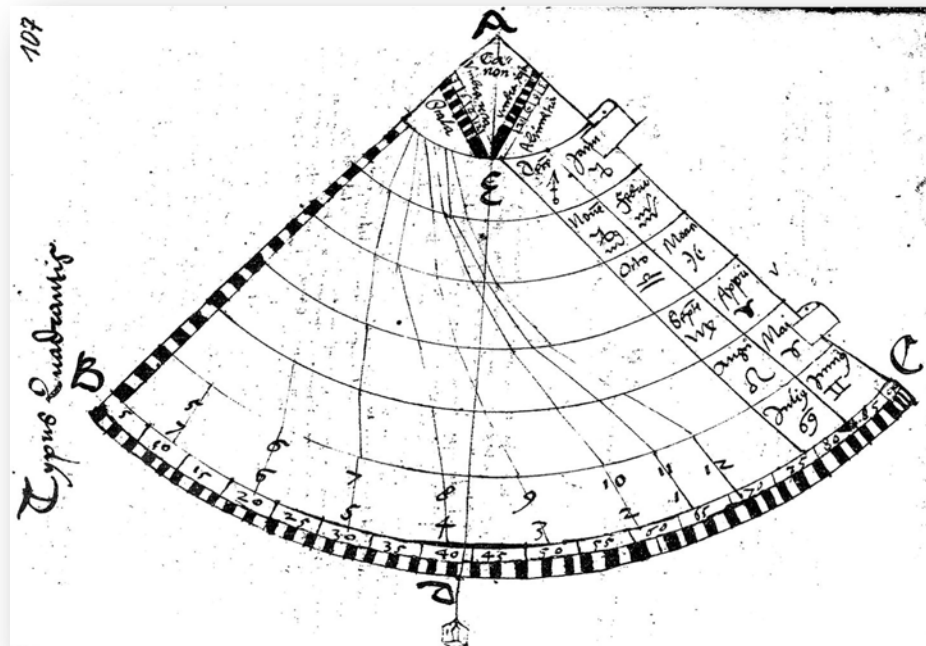


Figure 8: Cosmographical diagrams also can be found in the Vienna miscellany. Therein, the cosmic sections are given in a non-standard and non-Ptolemaic order, where the planet Mercury is placed next to the sun and Venus next to the moon. This conservative choice could be a scribal error, as the symbols of these plantes are very similar, but also could be done on purpose. From (Binderlius [ca. 1519], fol. 97r). Austrian National Library, Cod. ser. n. 4265.

- (fols. 105r–107r, 233v–241r): A short, illustrated manuscript essay about the quadrant (*Ad modu[m] componendi Quadrante[m] quinq[ue] capitula*) (Figure 9) and about the construction of the new quadrant (*Regula ab fabrica[n]du[m] q[ua]dra[n]tem; Compositio quadra[n]tis novi*). This interesting section corresponds with the handwritten texts on (fols. 230r–33r), telling the reader how sundials (*horologium*) were fabricated and



used. Figure 9: The miscellany also contains an illustrated chapter about the construction of the Quadrant. From (Binderlius [ca. 1519], fol. 107r). Austrian National Library, Cod. ser. n. 4265.

- (fols. 192r–201v): This part of the miscellany deals with genealogy. The Vienna print by Johann Winterburger, who published the text of Johannes Andreae's *Arbor consanguinitatis* in 1505 (Andreae 1505; Denis 1793, 32–33, No. 751), is again linked with other manuscript notes inside of the miscellany, which can be found on (fols. 108r–111v).
- (fol. 112r–117v): The 1515 Vienna print (Johannes Singriener for Lucas Alantsee) of the *Somnium Scipionis*, edited with an addition by Petrus Moravus de Radisch (1515) (Denis 1782, 126, No. 135),⁷⁰ is also annotated.

⁷⁰ The Dream of Scipio, a text written by Cicero as the sixth book of his *De re publica*, describes a fictional dream vision of the Roman general Scipio Aemilianus two years before the destruction of Carthage in 146 BCE.

- (fols. 118r–191v): This section leads us finally to the *Opusculu[m] de Sphaera clarissimi philosophi Ioannis de Sacro busto* in the Vienna edition, written by Johannes Singriener for Leonhard Alantsee (Sacrobosco 1518; Denis 1782, 183–84, No. 192): It starts on (fol. 118v) with an introductory poem by Philipp Gundel (1493–1567) who became professor of poetics at Vienna University the same year.⁷¹ The print, which is accompanied with the *Theoricae (Novae) Planetarum* by the *excellentissimi astronomi* Georg Peurbach, is again annotated with numerous marginal notes.

The cosmic section appears twice: On (fol. 120r) (Figure 10), between the coat of arms (originally blank spaces in the print, ascribed here to Austria and Vienna), we read: “Anno domini 1518 8 Kalen[*das*] Novem[*bris*] complevi Sphaera[m] m[a]g[*ist*]ro Sebastiano Eynspar gu[b]er[*na*]tore b[*ursa*?] Lili[*orum*?],”⁷² while the left inscription below the diagram refers to the death of Emperor Maximilian I: “Fato concessit illustris princeps ac Ro[*manorum*] imp[*erator*] Maximilianus Austrie dux in oppido Wels 4 miliaribus sup[*er*] Lintz a Castra 12 die Januarij Anno d[*omi*]ni 1519.” On the right-hand side, however, the founder of Vienna University, Rudolf IV, is immortalized: “Rudolphus [...] imp[*erator*] dux Austrie Studii Vien[*nensis*] fundato[r] Anno d[*omi*]nic[*a*]e incarnationis 1366.” On the other hand, above the second cosmic section on (fol. 123v), we are informed about the Ottoman expansion in Central Europe: “Obsedit Vienna[m] Austriae im[*m*]anissim[*us*] Turcorum Tyran[*nus*] Selim anno Christi [et]c[*etera*] 30 me[n]se 7briet[*cetera*].”⁷³ Beneath the diagram, further contemporary events (such as the coronation of Charles V in 1530) are mentioned.

⁷¹ For further information on the professor of poetics Philipp Gundel, see (Posch 1961).

⁷² Magister Sebastian Eynspar appears for the first time in the (Acta Facultatis Artium IV) in the Vienna University Archive, fol. 61r–v as “Sebastianus Crucificis” from Weltzen, who was approved for determination on 3rd of January 1509. In winter semester 1514, he gave a lecture about “librum De anima” and four years later taught about Sacrobosco’s *Sphaera* in Vienna (Table 2), so it is most likely that he also used the 1518 print for doing so (Maisel 2007, 114 [24819/b-4], 151 [26015/p-31], 171 [26770, p-14], 194–95 [27523/p-7], 200–1 [27664/p-6], [27692/p-10], [27716/p-13], [27915/p-3]). Eynspar became new decan in winter semester 1530, see (Maisel 2007, 212 [27964/p-1]) and in the following semester appears for the last time, as thesaurar (Maisel 2007, 214 [27997/p-2]).

⁷³ On 30th of September 1520, Suleiman the Magnificent (1494–1566) was proclaimed sultan of the Ottoman Empire. Nine years later, during the Siege of Vienna, he was unable to capture the imperial city on the Danube river (Dürriegl 1979; Hummelberger 1976). However, it is unclear why here the date is given as September 1530, the same year when the authentic round view of Vienna was mapped by the Nuremberg printer Nikolaus Melde-mann (died 1552) (Dürriegl 1980).



Figure 10: The Vienna edition of the *Opusculum de Sphaera clarissimi philosophi Ioannis de Sacro busto* (1518) is annotated with numerous marginal notes in the Vienna miscellany (probably annotated by Petrus Freylander), who filled out the blank spaces. From (Binderlius [ca. 1519], fol. 120r). Austrian National Library, Cod. ser. n. 4265.

Due to the “Acta facultatis artium,” we also know when the “*speram materiam*” (probably a cosmographical course about globes which also uses the second chapter of *De sphaera*) was lectured at Vienna University: If we analyze these dates (Table 2), we find again the Vienna magisters Petrus Grienbald and Petrus Freylander as academics, but also Joachim Watter (=Vadian!) and especially Magister Sebastian Eynspar, who lectured on cosmography in the winter semesters of 1517, 1518, and 1519 (Maisel 2007, 135 [25456/p-10], 136 [25479/p-33 & p-35], 137 [25500/p-54]).



Figure 11: Another page from the Vienna edition of the *Opusculum de Sphaera clarissimi philosophi Ioannis de Sacro busto* (1518), also annotated with numerous marginal notes. The Model for this page was Figure 1. From (Binderliius [ca. 1519], fol. 121r). Austrian National Library, Cod. ser. n. 4265.

Roberto de Andrade Martins also mentions on his useful homepage⁷⁴ a doubtful edition of Sacrobosco's *Sphaera* from 1511; but as long we have no other information about this possible Vienna print⁷⁵ we must remain skeptical of its existence. Against the hypothesis of a 1511 forerunner edition is the fact that the second illustration of the planetary system on the Vienna print (fol. 122r) leads us to the year 1517.

Moreover, the coat of arms of Georg Tannstetter, a star inside a ring that is included in the diagram showing an armillary sphere on (fol. 121r) (Figure 11), could be a hidden hint that it was probably Collimitius who initiated this print (Hayton 2015, 80). Therefore, Tannstetter should be recognized as the author in the background of this edition. However, due to the dates mentioned in the text, the marginals in this print could not have been added before 1530 (*terminus post quem*).

- (fols. 245v–251r): This is a short excerpt of a manuscript, compiled by Petrus Freylander, of the first book of *De Imagine Mundi*, an encyclopedia of popular cosmology and geography combined with a chronicle of world history, that was widely-used for teaching of the Quadrivium (Flint 1983; Kugler 1997; Von den Brincken 1994). The famous opus, written around 1120 by the Christian theologian Honorius Augustudonensis (1080–1154), has been translated (like the *Tractatus de sphaera*) also into many different vernacular languages. Freylander, however, attributes the geographical text cited here (a compilation of Latin and non-Latin literature) to Saint Fulgentius (486–533), who was bishop of Ruspe, a Roman province in North Africa.⁷⁶
- (fols. 251v–264v, 309v–310r): the *Introductorium sive Epithome in Geographiam* was used by Joachim Vadian for his geographical lectures at the University of Vienna and later formed the basis for his *Epitome* (Horst et al. 2018, 55–58). His text is known to exist in five manuscript copies; one of them can also be found in the Swiss miscellany (Zentralbibliothek Zürich, Ry 318.6, 2r–38r); another one is at the University library of Vienna (II-193091). The version in the present miscellany was finished on Sunday, 3rd

⁷⁴ Roberto de Andrade Martins (2010), Homepage: Johannes de Sacrobosco. Editions of the *Tractatus de Sphaera*: <http://www.ghtc.usp.br/server/Sacrobosco/SB1511b.htm> (accessed 26 February 2019).

⁷⁵ The doubtful *Sphaera* edition of 1511 is further described by (Houzeau and Lancaster 1882/1889, 507–8, No. 1650), but not in (Denis 1782).

⁷⁶ There is a continuing debate whether the bishop can be identified with the contemporary fifth/sixth century Latin writer Fabius Planciades Fulgentius, but there is little evidence for this hypothesis (Hays 2003).

of April 1519 (*"Anno 1519 dominica letarem bursa Liliorum"*). It was Vadian who (before his return to St. Gall in 1518) also published together with Ulrich Faber:

- (fols. 291r–304v): a short treatise about natural philosophy by Petrus von Dresden, the *Parvulus Philosophiae Naturalis*, which was printed in Vienna by Johannes Singriener (Vadian and Faber 1516); see (Denis 1782, 150, No. 164). This work is illustrated in the miscellany with a beautiful handdrawn picture of a human head, showing the locations of the sins.⁷⁷ On the other hand, another print, the
- (fols. 265r–290v): *Elementarius Dialectice*, published in Augsburg (Eck 1517), contains only minor handwritten notes. Its author, the German theologian Johannes Maier von Eck (1486–1543), was one of the adversaries of Martin Luther (1483–1546) and is widely known as defender of Catholicism during the Protestant Reformation.
- (fol. 313v): The last page of the miscellany, containing many other notes, is a manuscript supplement of a later time and describes the epitaph for Baron Sigismund von Herberstein (1486–1566), who is well known for his extensive writing on the geography, ethnography, and history of Russia, where he was sent as ambassador of the Holy Roman Emperor and lived for nine months to study a hitherto largely unknown Russian society (Pferschy 1989). The results of his travels are reported in his book *Rerum Moscoviticarum Commentarii* (1549; *"Notes on Muscovite Affairs"*), which became the main early source of knowledge about Russia in Western Europe (Kämpfer 1999). This part, which was added later, shows that the elaborate miscellany presented here goes much beyond cosmography.

The compendium provides us with an insight into the context in which the *Tractatus de sphaera* was taught: Vienna at the beginning of the sixteenth century. As the various parts of the elaborate miscellany demonstrate, early-modern cosmography was understood as a term of the *"Studia Humanitas"* and thus included much more than astronomy in the *Sphaera*: It also encompasses mathematics, arithmetic, geometry, astronomy, astrophysics, astrology, genealogy, theology, dialectics/logics, the fabrication of instruments, especially globes, quadrants, and sundials; but primarily geography, geology, and cartography.

⁷⁷ This illustration reminds us of an equal figure (Reisch 1515, book 10, fol. ciiv) in the *Margarita Philosophica noua*, by Gregor Reisch. On the illustrations in this encyclopedia, see (Büttner 2003).

The special role of the Vienna book printers Lucas Alantsee (Tegniphilus, flourished 1505–1522) and Johannes Singriener I (“the Older,” ca. 1480–1545), who printed in their workshop in Vienna most of the cosmographical treatises in this miscellany (including the *Opusculu[m] de Sphaera clarissimi philosophi Ioannis de Sacro busto* in 1518) for the local market (Reske 2015, 1047–50), should be a topic for future research, even if we do not have many sources on their lives. However, it can be stated that only one print of the *Tractatus de Sphaera* was published in the imperial city of Vienna (Sacrobosco 1518), which is quite strange, especially if we compare it to other printing places (such as Leipzig or later Wittenberg), where the reception of the *De sphaera* can be followed in numerous prints. But this was probably enough for the Viennese students, who from 1518 to 1527 during a crisis at the university (Maisel 2014; Mühlberger 1996)—in the epoch of decline before the Siege of Viena (1529), that was plagued by the Black Death—could only hear ten courses on cosmographical topics (see Table 2).

6.3 Cartographical activities surrounding Vadian's reception of Pomponius Mela

In this context, another important geographical textbook from Antiquity needs to be mentioned. It was compiled by Joachim Vadian, who gave a course about the Roman geographer Pomponius Mela at the University of Vienna in summer semester 1514 (Horst et al. 2018, 53), and again in winter semester 1517/1518.⁷⁸ In *de orbis situ libri tres, adiectis Joachimi Vadiani Helvetii in eosdem Scholiis*, Vadian edited the famous Mela chorography with own comments (Vadian 1518). His book was printed by Johannes Singriener for Lucas Alantsee in May 1518 (Denis 1782, 186–88, No. 196); a second edition was published in Basel by Andreas Cratander in January 1522.

An international research group (Horst et al. 2018) could identify in total eight copies of this important treatise, each of which illustrated with the traditional twenty-six regional maps of the Ptolemaic *Geographike Hyphegesis*. These manuscript maps were handdrawn by an unknown author in the circle around Vadian in Vienna, who used the maps of the so-called “Strasbourg Ptolemy”-print of 1513, edited by the cartographer Martin (Waldseemüller 1513) as a model. We can only assume that these manuscript maps, which were included as a visual appendix to the cosmographical print, were used for pedagogical reasons at the university: it is even possible that these map copies (partially similar in their layout) were drawn by Vadian's students during the course directly from the printed edition. Another hypothesis is that they were produced directly in the circle of the Vienna publishing house, which sold these illuminated appendixes as an extra, if requested by the client. However, only one copy (preserved at the university library in Vienna, II-193091) gives the reader the complete image of the earth with a map of the whole world (Horst 2016). Furthermore, on the back of one of the map copies, in the National and University Library of Slovenia in Ljubljana (G II 1225), we find short cosmographical notes, which were written by none other than *Magister Petrus Freylander carinthius ex Wolfsperg tunc et conventor b[ursi] agni*. This information impressively documents that it probably was the scholar Petrus Freylander who connected the cosmographical and cartographical activities in Vienna.

⁷⁸ To the contemporary teaching of geography at Vienna University, see (Klecker 2012, 92–98).

7 Conclusion and perspectives for future research

As is well known, Sacrobosco's *Tractatus de sphaera* was the "most popular elementary textbook" on astronomy "throughout Western Europe for over four hundred years" (Johnson 1953, 290). The database at the MPIWG (bibliographic data of 320 books that contain, or are related to, the text by Sacrobosco and were printed between 1472 and 1650) and the appendix to this paper clarifies that the text of *De sphaera* was often accompanied by extensive commentaries.

Already during the fifteenth century, an astronomical circle in Vienna—mainly Georg Peurbach and his student Johannes Müller/Regiomontanus—made astronomical observations and enlarged the topic with important new publications: notably, Peurbach's *Theoricae novae planetarum* (around 1473) and the *Disputationes contra deliramenta Cremonensia* by Regiomontanus (ca. 1475) appear together in the reception of the printed editions of the *Sphaera* as a supplement to the Venice print (1482, by Erhard Ratdolt).

Both treatises are also important for understanding the methods of the authors who edited the early-modern prints of the *Sphaera*. However, neither Peurbach nor Regiomontanus, whose texts are included in many editions, ever commented on Sacrobosco themselves.

It was only decades later, in the era of "integral humanism," that the unique treatise of the *Sphaera* was printed in the imperial city on the Danube river by Lucas Alantsee and Johannes Singriener in 1518. This is curiously the only Sacrobosco edition which was ever edited in Vienna and we have some hints that Georg Tannstetter could have been the editor behind this text.

Moreover, a unique compendium (Cod. ser. nov. 4265) that probably belonged to Magister Petrus Freylander at Vienna University was obviously used for teaching the quadrivium, as this codex with its various treatises (analyzed here for the first time) is annotated extensively by Freylander and other readers. These notes offer us an interesting insight into how the *Sphaera* print from 1518 was utilized by contemporary scholars in Vienna: probably as a didactic tool for teaching cosmography, which was visualized together with a set of manuscript maps illustrating the contemporary printed edition of Pomponius Mela (Vadian 1518). However, these cartographic products are also closely connected to the author of the Vienna edition of 1518,

as the *Cosmographiae introductorium* by Binderlius (written by Petrus Freylander) re-uses a diagram of the world from that print.

The various manuscripts and prints in the Vienna miscellany complement Sacrobosco's work and impressively demonstrate what kind of cosmographical knowledge was taught at the university (compare also with Table 2). Only further analyses of the network of Vienna scholars and the circulation of the various text outputs of antique and medieval works printed by Alantsee and Singriener, as well as their use for pedagogical techniques and private study in general, can lead us to a new perception of epistemology at universities in the sixteenth century.

But we still know too little about this important topic, especially about the "readers in the classrooms:" Richard Oosterhoff (Oosterhoff 2015) has studied the use of the *Tractatus de Sphaera* not only by the Alsatian humanist Beatus Rhenanus (1485–1547) but also by the Swiss polymath Henricus Loriti/Glareanus (1488–1563). From Glarean's collection we also have a miscellany (preserved in the University library of Munich, 4 Inc.lat.310) that has not been studied yet in detail but looks most interesting in terms of the reception of the *Sphaera*, as here are seven different editions of Sacrobosco bound together;⁷⁹ the miscellany is even accompanied with his *Algorismus* (Sacrobosco, 1501).

Especially in the years between 1490 and 1520, we notice a transition period at the European universities, when the didactics were enriched with printed textbooks then finding their way into the classrooms and appearing with commentary and numerous lecture notes inscribed. For that purpose, a further understanding of the readers and adapters of the *Sphaera* and their networks and contexts can be most helpful.

Only the meticulous transcription of Renaissance miscellanies with marginalias (as written by the reader Petrus Freylander after 1520 in the 1518 print of the *Sphaera*) and a closer study of the network of the authors, commentators, and printers that together disseminated cosmographical knowledge will allow us to find a new epistemological understanding of

⁷⁹ The incunabula preserved at the University library of Munich (4 Inc.lat.310) contains the following editions, which were bound together only in modern times: (1) Leipzig, 1489: Konrad Kachelofen; (2) Venice, 1478: Franciscus Renner; (3) Venice, 1488: Johannes Lucilius Santritter and Hieronymus de Sanctis; (4) Venice, 1490: [Bonetus Locatellus] for Octavianus Scotus; (5) Venice, 1491: Guilelmus Anima Mia, Tridinisensis; (6) Paris, 1493: Georgius Mittelhvs; (7) Cologne, 1505: Quentel.

Renaissance cosmography, which plays a major role not only in the history of the reception of the *Sphaera* and the history of printing, but also in the history of science in general.

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Clm 453

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Clm 14583

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Rar 1482

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4 Inc. lat. 310

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10 Table 1: Teaching of the “Theoricis Planetarum” at Vienna University from 1472 to the 1520s

After examination of Acta Facultatis Artium III and IV in the Vienna University Archive, Cod. Ph 8 & 9, see also (Maisel 2007).

1472:	Mag. Johannes Tichtl (de Grein) Mag. Andreas Gebolff/Gewolff (de Straubing)
1474:	Mag. Johannes Kupherperger (de Küpherperig) Mag. Martinus (de Laibaco)
1475:	Mag. Bernardus (de Mistelpach) Mag. Johannes Arcuficis (de Cibinio) Mag. Johannes Flechtner (de Hiersperg/Imsperg)
1476:	Mag. Udalricus (de Teyblicz)
1477:	Mag. Fridericus Gresel/Gräsel (de Haidenhaim)
1478:	Mag. Jodocus Herler (de Egra)
1480:	Mag. Jodocus Herler (de Egra)
1481:	Mag. Fridericus Gresel/Gräsel (de Haidenhaim)
1484:	Mag. Michael Zoys (de Mansee)
1485:	Mag. Fridericus Gresel/Gräsel (de Haidenhaim)
1488:	Mag. Johannes Wann (de Buda)
1491:	Mag. Johannes Muntz/Müntz (de Plabeyren)
1494:	Mag. Maximilianus Seeleitter (de Patavia)
1502:	Mag. Paulus Rockner (de Vienna)
1505:	Mag. Georgius Tannstetter
1511:	Mag. Georgius Tannstetter (Hayton 2015, 79–80).
1517:	Mag. Andreas Perlach ⁸⁰
1524:	Mag. Andreas Perlach

⁸⁰ To Tannstetter's student Andreas Perlach (1490–1551) from Slovenia, “a master at the University of Vienna and an adviser to the Habsburg court in Vienna who for more than a decade produced astrological almanacs and ephemerides that supported the Habsburg political agenda,” see (Hayton 2015, 12, 145–69, 186–95).

11 Table 2: Teaching of the “Speram materialem” at Vienna University from 1472 to the 1520s

After examination of Acta Facultatis Artium III and IV in the Vienna University Archive, Cod. Ph 8 & 9, see also (Maisel, 2007).

- 1472: Mag. Andreas (de Osgocia/Ostocia)
Mag. Andreas Rosmulner (de Ruspach)
Mag. Ulricus Rauch (de Lu)
Mag. Blasius (de Waradino)
Mag. Ulricus Rampek (de Lanczhuta)
- 1474: Mag. Paulus Pachamer (de Süffring)
Mag. Leonardus Seydel (de Stain)
- 1475: Mag. Andreas Rosmulner (de Ruspach)
Mag. Martinus (de Laybaco)
Mag. Johannes Lachamer (de Dinckelspuchel)
Mag. Sixtus Sibenhar (de Estenbach)
- 1476: Mag. Georius Kerntner (de Wildan)
Mag. Petrus Purger (de Halstadt)
Mag. Cristannus Stengel (de Lanfelden)
Mag. Mathias Reusel (de Gundersdorff)
- 1477: Mag. Andreas Rosmulner (de Ruspach)
Mag. Jodocus Herler (de Egra)
Mag. Michel Schespurg (de Septem Castris)
- 1478: Mag. Cristannus Stengel (de Lanfelden)
Mag. Johannes Slosser (de Hambach)
Mag. Federicus Pewsmair (de Perching)
- 1479: Mag. Johannes (de Kuppferberg)
- 1480: Mag. Martinus Brünn/Prunner (de Rackndorff)
Mag. Georius Peirel (Jorius Peyerl de Waidhoffen)
Mag. Nicolaus Bernicz (de Rudolfswierd)
Mag. Oswaldus Stelczer (de Gmunden)
- 1481: Mag. Andreas Rosmulner (de Ruspach)
Mag. Leonardus Kuttner (de Pusonio)
- 1482: Mag. Petrus Zeckel (de Czibinio)

- Mag. Johannes Neuman (de Vienna)
- 1487: Mag. Martinus Brünn/Prunner (de Rackndorff)
Mag. Wenczeslaus (de Budweis/Wudweis)
- 1488: Mag. Valentinus Krauss (de Corona)
- 1489: Mag. Johannes Trapp (de Vienna)
- 1490: Mag. Martinus Brünn/Prunner (de Rackndorff)
- 1491: Mag. Johannes Hohenprunner (de Lintz)
- 1492: Mag. Johannes Muntz/Müntz (de Plabeyren)
Mag. Nicolaus Civis (de Buda)
- 1493: Mag. Johannes Fabri (de Weißenburga)
- 1494: Mag. Erasmus Sundleuter (de Pewrbach)
- 1497: Mag. Johannes Pengel (de Weissenburga)
- 1498: Mag. Johannes Fabri (de Weißenburga)
Mag. Johannes Scheck (de Tagersheym)
- 1502: Mag. Johannes Fabri (de Weißenburga)
Mag. Thomas Resch (de Krembs): speram mundi!
Mag. Paulus Haug/Hynnach (de Riedewerg)
Mag. Paulus Thuennsteter (de Vienna)
- 1505: Mag. Joannes Saltzman (de Stiria): speram mundi!
Mag. Wolfgangus Camerinus (de Zwetel)
- 1506: Mag. Stephanus Mauss (de Gwnderstorff)
- 1511: Mag. Christophorus Piscatoris (de Liczinng?)
Mag. Erhardus Hetzendorffer (de Holabrun)
- Mag. Joachimus Watter/de Watt/Vadian**
- Mag. Petrus Freylander**
- 1514: Mag. Thomas Stratzinger (de Neunburgoforensi)
Mag. Steffanus Raisperger (de Tulnensis)
Mag. Ludwicus Kornhueber
- 1516: **Mag. Petrus Freylander**
- 1517: **Mag. Sebastianus Einspar (Currificis de Weltzen)**
Mag. Ciprianus Coster (de Stertzing)
Mag. Sebastianus Kunzel (de Osbest?)
- Mag. Petrus Gruewalt/Gribolt/Grienwaldt (de Perg)**
Mag. Joannes Hain/Heyn (de Vienna)
- 1518: **Mag. Sebastianus Eynspar (Currificis de Weltzen)**

- Mag. Sebastianus Gleyss (de Purgkhstal)
- 1519: **Mag. Sebastianus Eynspar (Currificis de Weltzen)**
Mag. Nicolaus Treitbein/Truchwein (de Studgardia)
- 1520: Mag. Johannes Newpek/Nupek (de Hailprunn)
- 1523: Mag. Joannes Winter (de Lauffen)
- 1524: Mag. Stephanus Mauss (de Gwnderstorff)
Mag. Petrus Gruewalt/Gribolt/Grienwaldt (de Perg)
- 1526: Mag. Mauritius Marchweg (de Tanbergmunster?)
- 1527: Mag. Bartholomäus Gebel (de Franckfordensis)

12 Appendix: 18 Treatises of the *Sphaera* (1482–1629), published together with the commentaries by Peurbach or/and Regiomontanus

Sacrobosco, Johannes de. 1482. Nouicijs adolesce[n]tib[us]: ad astronomica[m] remp[ublicam] capessenda[m] aditu[m] impetra[n]tib[us]: p[ro] breui rectoq[ue] tramite a vulgari vestigio semoto: Iohannis de sacro busto sphaerico[m] opuscul[um]. Co[n]traq[ue] cremone[n]sia i[n] planetar[um] theoricas delyrame[n]ta Joannis de monte regio disputationes ta[m] acuratiss[imam]. q[uam] utiliss[imam]. Necno[n] georgij purbachij i[n] eoru[n]de[m] mot[us] planetar[um] acuratiss[imi] theorice: dicatu[m] op[us] vtili serie [con]text[um] inchoat. [Venice]: Erhardt Ratdolt Augustensis.

Hamel 2014, 75, No. 8; doi.org/21.11103/sphaera.100692

Contains:

- (1) 7[8]–40⁸¹ [fols. a2r–c2r]: [Tractatus de Sphaera].
- (2) 41–70 [fols. c2r–e1r]: Disputationu[m] Joannis de monte regio co[n]tra cremonensia i[n] planetar[um] theoricas delyramenta praefatio.
- (3) 70–125 [fols. e1r–b4v]: Theoricae novę planetar[um] Georgij Purbachij astronomi celebratiss[imi].

Literature: Bennett/Bertoloni Meli 1994, 14–15, cat. No. 2.

Sacrobosco, Johannes de. 1485. Noviciis adol[sc]scentib[us]: ad astronomicam rempu[blicam] capessenda[m] aditu[m] impetra[n]tib[us]: p[ro] breui rectoq[ue] tramite a vulgari uestigio semoto: Iohannis de sacro busto sphaericum opusculu[m]. Georgiiq[ue] Purbachij i[n] mot[us] planetar[um] acuratiss[imi] theorice Necno[n] contra Cremonensia in eorundem planetar[um] theoricas delirame[n]ta Joan[n]is de monte regio disputatio[n]es ta[m] acuratiss[imam] q[uam] utiliss[imam] dicatu[m] opus utili serie context[um] inchoat. [Venice]: Erhardi Ratdolt Augustensis.

Hamel 2014, 75–76, No. 10; doi.org/21.11103/sphaera.101123

Contains:

- (1) fols. 1r–32r: [Tractatus de Sphaera].
- (2) fols. 32v–64v: THEORICAE NOVAE PLANETARVM GEORGII PVRBACHII ASTRONOMI CELEBRATISS[IMI]. [an English translation of this text can be found in Aiton 1987, 9–43].
- (3) fols. 64v–80v: DISPUTATIONVM IOANNIS DE MONTE REGIO CONTRA CREMONENSIA IN PLANETARVM THEORICAS DELIRAMENTA PRAEFATIO.

Sacrobosco, Johannes de. 1488. SPAERAE MVNDI Co[m]pendiu[m] FOELICITER INCHOAT. Nouiciis adolescentibus: ad astronomica[m] remp[ublicam] capessenda[m] aditum impetra[n]tibus: pro breui recto q[ue] tramite a vulgari uestigio semoto: Ioha[n]nis de sacro busto sphaerico[m] opusculu[m] una cu[m] additionib[us] no[n]nullis littera A sparsim ubi intersertae sint signatis Contraq[ue] cremone[n]sia in planetar[um] theoricas delyramenta Ioha[n]nis de monte regio disputatio[n]es ta[m] acuratiss[imam] q[uam] utiliss[imam]. Nec no[n] Georgii purbachii i[n] eoru[n]de[m] mot[us] planetar[um] acuratiss[imi] theoricae: dicatum opus: utili serie contextum fausto sidere inchoat. Venetiis: Santritter Iohannes & de Sanctis Hieronymo.

Hamel 2014, 76–77, No. 12; doi.org/21.11103/sphaera.100822

Contains:

- (1) 7–64: [Tractatus de Sphaera; annotated by Anonymous].

⁸¹ The numbers in this list given here before the folio numbers refers to the page numbers of the PDF in the *Sphaera* database of the MPIWG.

- (2) 65–92: DISPUTATIONVM IOHANNIS DE MONTE REGIO CONTRA CREMONENSIA IN PLANETARVM THEORICAS DELIRAMENTA PRAEFATIO.
- (3) 93–140: THEORICAE NOVAE PLANETARVM GEORGII PURBACHII ASTRONOMI CELEBRATISS[IMI].
- (4) 141: Carmina in impressor[um] hui[us] opusculi laudem.

Further Literature: Heitzmann 2008, Nr. 15, 49–50.

Sacrobosco, Johannes de. 1490. SPHAERAE Mundi compendium foeliciter inchoat. Nouiciis adolesce[n]tibus: ad astronomica[m] re[m]p[ublicam] capessenda[m] aditu[m] impetra[n]tibus: p[ro] breui rectoq[ue] tramite a uulgari uestigio semoto: Ioha[n]nis de sacro busto sphaericu[m] opusculu[m] una cu[m] additio[n]ibus no[n]nullis l[itte]ra A sparsim ubi intersertae sint signatis: Co[n]traq[ue] cremone[n]sia i[n] planetar[um] theoricas delyramenta loa[n]nis de mo[n]teregio disputatio[n]es tta[m] acuratis[simam] q[uam] utilis[simam]. Nec no[n] Georgii purbachii: i[n] eoru[n]de[m] motus planetar[um] acuratiss[imi] theoricae: dicatum opus: utili serie co[n]textu[m]: fausto sidere inchoat. Venetiis: Octauiani Scoti [for Bonetus Locatellus].

Hamel 2014, 77–78, No. 16; doi.org/21.11103/sphaera.100823

Contains:

- (1) 10–49: [Tractatus de Sphaera; annotated by Anonymous].
- (2) 50–66: *Disputationum Joannis de monte regio contra cremonensia in planetarum theoricas deliramenta praefatio.*
- (3) 67–102: *Theoricae novae planetar[um] Georgii purbachii astronomi celebratiss[imi].*

Sacrobosco, Johannes de. 1491. SPHAERA MVNDI. SPHAERAE mundi compe[n]dium foeliciter inchoat. Nouiciis adolesce[n]tibus: ad astronomica[m] re[m]p[ublicam] capessenda[m] aditu[m] impetra[n]tibus p[ro] breui rectoq[ue] tramite a uulgari uestigio semoto: Ioan[n]is de sacro busto sphaericu[m] opusculu[m] una cu[m] additio[n]ibus no[n]nullis l[it]tera A sparsim ubi intersertae sint signatis: Co[n]tra q[ue] cremone[n]sia i[n] planetar[um] theoricas delyramenta loa[n]nis de monteregio disputat[i]o[n]es ta[m] acuratis[simam] quam utilis[simam]: Nec no[n] Georgii purbachii: in eoru[n]de[m] motus planetar[um] accuratis[simi] theoricae: dicatu[m] opus: utili serie co[n]textu[m]: fausto sidere i[n]choat. Venetiis: per Magistrum Gullielmum de Tridino de Monteferrato.

Hamel 2014, 80, No. 20; doi.org/21.11103/sphaera.100824

- (1) 10–49: [Tractatus de Sphaera; annotated by Anonymous].
- (2) 50–66: *Disputationum Joannis de monte regio contra cremone[n]sia in planetar[um] theoricas deliramenta praefatio.*
- (3) 67–102: *Theoricae novae planetar[um] Georgii purbachii astronomi celebratiss[imi].*

Sacrobosco, Johannes de. 1494. SPHAERAE mundi compendium foeliciter inchoat. Nouiciis adolesce[n]tibus: ad astronomicam re[m]p[ublicam] capessenda[m] aditu[m] impetra[n]tibus: p[ro] breui rectoq[ue] tramite a uulgari uestigio semoto: loa[n]nis de sacro busto sphaericu[m] opusculu[m] una cu[m] additio[n]ibus no[n]nullis l[itte]ra A sparsim ubi i[n]tersertae sint signatis: Co[n]traq[ue] cremone[n]sia i[n] planetar[um] theoricas delyramenta loa[n]nis de mo[n]teregio disputat[i]o[n]es tta[m] acuratis. q[uam] utilis: Nec no[n] Georgii purbachii in eoru[n]de[m] motus planetar[um] accuratis[simi] theoricae: dicatu[m] opus: utili serie co[n]textu[m]: fausto sidere i[n]choat. Venetiis: mandato & expensis nobilis uiri Octaviani scoti [Ottaviano Scoto I].

doi.org/21.11103/sphaera.100885

Contains:

- (1) 7–46: [Tractatus de Sphaera; annotated by Anonymous].
- (2) 47–63: *Disputationum Ioannis de monte regio contra cremonensia in planetarum theoricas deliramenta praefatio.*
- (3) 64–98: *Theoricae novae planetar[um] Georgii purbachii astronomi celebratiss[imi].*

Sacrobosco, Johannes de. 1499. *Sphaera Mundi* cu[m] tribus Commentis nuper editis v[ideli]z[et] Cicchi Esculani, Francisci Capuani de Manfredonia, Iacobi Fabri Stapulensis. [Venice: Simone Bevilacqua].

Hamel 2014, 83–84, No. 31 (lists two variants!). doi.org/21.11103/sphaera.100273

Contains:

- (1) 2–52 [Annotated part to the *Sphaera* by Cecco d'Ascoli]: *Cicchi Esculani viri Clarissimi in Sphaeram Mundi Enarratio*.
- (2) 54–55 [Dedication Letter of F. Capuano to Laurentio Donato]: *Quaestori Patauino Laurentio donato Patricio Veneto Franciscus Capuanus Sipontinus Artium ac Medicinae Doctor S.P.D.*
- (3) 56–135 *Tractatum de Sphaera quattuor capitulis distinguimus* [by Jacobi Fabri].
- (4) 136/137 *Index Libri*.
- (5) 138–139 [Introduction by Jacques Lefèvre d'Étaples, first published in 1494/1499]: *INTRODVCTORIA ADDITIO. Nonnullae ad sequentia notae*.
- (6) 140–172 [Annotated Part by Jacques Lefèvre d'Étaples, first published in 1494]: *IACOBI Fabri Stapulensis in Astronomicum introductorium Ioannis de sacrobosco Co[m]mentarius co[n]sequenter autoris litterae: cui seruit. adiunctus. Argumenti autoris*.
- (7) 174–292 Peurbach's *Theoricae novae planetarum* (annotated by Francesco Capuano di Manfredonia, but not named in the index)

Sacrobosco, Johannes de. 1501. *Sphaera mundi*. SPHAERAE MVNDI COMPENDIVM FOELICITER INCHOAT. Nouitiis adolescentibus: ad astronomica[m] re[m]pu[blicam] capessenda[m] additu[m] impetrantibus: pro breui rectoq[ue] tramite a vulgari uestigio semoto: loa[n]nis de sacro busto sphaericu[m] opusculum una cu[m] additionibus nonnullis littera A sparsim ubi intersertae sint signatis. Contraq[ue] cremone[n]sia in planetarum theoricas delyramenta Ioannis de monteregio disputationes tam acuratis[simam] q[uam] utilis[simam]: Nec non Georgii purbachii: in eorundem motus planetarum acuratiss[imi] theoricae: dicatum opus: utili serie contextum: fausto sidere inchoat. Venetiis: per Io. Baptista Sessa [Giovanni Battista Sessa I.].

Hamel 2014, 86, No. 36. doi.org/21.11103/sphaera.100892

Contains:

- (1) fols. 1r–21v: [Tractatus de Sphaera; annotated by Anonymous].
- (2) fols. 22r–30r: *Disputationum Ioannis de monte Regio contra Cremonensia in planetarum Theoricas deliramenta praefatio*.
- (3) fols. 30v–47r: *Theoricae novae planetarum Georgii Purbachii astronomi celebratiss[imi]*.

Sacrobosco, Johannes de. 1508. *Nota eorum quae in hoc libro continentur*. Oratio de laudibus astrologiae habita a Bartholomeo Vespucio florentino in almo Patauio Gymnasio anno. M.d.vi. TEXTUS SHAERAE IOANNIS DE SACROBVSTO. Expositio sphaerae Eximii artium & medicinae doctoris Domini Frau[n]cisci Capuani de Manfredonia. Annotatio[n]es no[n]nullae eiusde[m] Bartholomei Vespucii hic ide iterserta.

Iacobi frabri [sic!] stapulensis Commentarii in eandem sphaera[m].

Reverendissimi D[omi]ni Petri de aliaco Cardinalis & episcopi Cameracensi i[n] eandem quaestiones subtilissimae numero xiiii. Reverendissimi episcopi D[omi]ni Roberti linconie[n]sis sphaerae co[m]pendiu[m]. Disputationes loa[n]nis de regio monte co[n]tra cremonensia delirame[n]ta. Theoricarum nouarum textus cu[m] expositione eiusdem Francisci Capuani omnia nuper diligentia summa emendata. Veneta: Per Ioannem Rubeum et Bernardinum fratres Vercellenses [Giovanni & Bernardino Rosso; published by Giuntino Giunta].

Hamel 2014, 90, No. 47. doi.org/21.11103/sphaera.100915

Contains Peurbach's *Theoricae novae planetarum* (annotated by Francesco Capuano di Manfredonia) and the following parts:

- (1) fols. a2r–a3r: [Oratio on Astrology by B. Vespucci in Padua in 1506]: *Bartholomei Vespucci Florentini minimi inter artium & medicinae doctores: oratio habita in Celeberrimo Gymnasio Patauino: Pro sui prima lectione. Anno domini M.D.VI. Laudes prosequens Quadrivii ac presertim astrologiae quam ibi publice profitetur.*
- (2) fol. a3v: [Dedication letter of Sylvius Laurentius to Bartholomeus Vespucci]: *Sylvius Laurentius a portu Caballenus: Clarissimo artium Doctori: ac Astrologiae consultissimo domino Bartholomeo Vespuccio foelicitatem.*
- (3) fol. a4r: [Dedication Letter of F. Capuano to Laurentio Donato]: *Quaestori Patauino Laurentio donato Patricio Veneto Franciscus Capuanus Sipontinus Artium ac Medicinae Doctor S.P.D.*
- (4) fols. a4r–a4v & 1r–54r: [Annotated Part by Francesco Capuano di Manfredonia, first published in 1499]: *Ioannis de Sacrobusto Astrologi [sic!] Celeberrimi Spericum Opusculum cum breui & utili expositione Eximii Artium ac Medicinae Doctoris Domini Francisci Capuani de Manfredonia astronomiam in Patauino Gymnasio Puplice Foeliciter Incipit. Finis: Ioannis de sacrobusco Anglici Sphaerici operis: & super eodem. Domini Francisci Capuani de Manfredonia scripti.*
- (5) fol. 54r [Dedication letter of Jacques Lefèvre d'Étaples to Carolum Borram, first published in 1494]: *JACOBI Fabri Stapulen[sis] Commentarii in astronomicum Ioha[n]nis de Sacrobosco ad splendidum uirum Carolum Borram Thesaurarium Regium.*
- (6) fols. 56r–56v [Introduction by Jacques Lefèvre d'Étaples, first published in 1494/1499]: *INTRODVCTORIA ADDITIO. Nonnullae ad sequentia notae.*
- (7) fols. 56v–70v: [Annotated Part by Jacques Lefèvre d'Étaples, first published in 1494]: *IACOBI Fabri Stapulensis in Astronomicum inductorium Ioannis de sacrobosco Co[m]mentarius co[n]sequenter auctoris litterae: cui seruit. adiunctus. Argumenti auctoris.*
- (8) fols. 71r–87r: [Annotated Part by Pierre d'Ailly, first published in 1498 – in other version]: *Reverendissimi domini Petri de aliaco cardinalis & episcopi Cameracensis doctorisque celebratissimi quaestio prima.*
- (9) fols. 87r–89v: [Compendium of Robert Grosseteste]: *Reverendissimi Episcopi Roberti linconiensis Sphaerae compendium.*
- (10) fols. 90r–94v: *Disputationu[m] Ioannis de monte regio contra cremonensia in planetar[um] theoricas deliramenta praefatio.*
- (11) fols. 95r–160r (paginated 1r–65r): [Annotated Part by Francesco Capuano di Manfredonia]: *Theoricae novae planetaru[m] Georgii Purbachii astronomi celebratissimi. Ac i[n] eas Eximii Artium & medicinae doctoris Domini Francisci Capuani de Manfredonia: in studio Patauino Astronomiam publice legentis: sublimis expositio & lucentissimum scriptum.*

Sacrobosco, Johannes de. 1513. SPHERAE MUNDI COMPENDIVM FOELICITER INCHOAT / Nouitiis adolescentib[us]: ad astronomica[m] re[m]pu[blicam] capessenda[m] aditu[m] impetra[n]tibus: p[ro] breui rectoq[ue] tramite a uulgari uestigio se moto: Ioha[n]nis de sacro busto sphaericu[m] opusculum una cu[m] additio[n]ibus nonnullis littera A sparsim ubi i[n]ter sertae sint signatis. Co[n]traque cremonensia in planetar[um] theoricas deliramenta Ioannis de monte regio disputatio[n]es tam acuratis. q[uam] utilis.: Nec no[n] Georgii purbachii: in eorundem motus planetaru[m] acuratiss[imi] theoricae: dicatu[m] opus utili serie contextum: fausto sidere inchoat. Venetiis: per Melchiorem Sessa [Melchior Sessa I.].

Hamel 2014, 93, No. 56; doi.org/21.11103/sphaera.101023

- (1) 8–47: [Tractatus de Sphaera, annotated part by Anonymus].
- (2) 48–64: *Disputationem Ioannis de monte Regio contra Cremonensia in planetarum Theoricas deliramenta praefatio.*
- (3) 65–113: *Theoricae novae planetarum Georgii Purbachii astronomi celebratiss[imi].*

Sacrobosco, Johannes de. 1518. *Sphaera cum commentis in hoc volumine contentis. videlicet. Cichi Esculani cum textu Expositio Joannis Baptiste Capuani in eandem Jacobi Fabri Stapulensis Theodosij de Speris Michaelis Scoti Quae[stion]es Revere[n]dissimi domini Petri de Aliaco etc. Roberti Linchontensis Compendium Tractatus de Sphaera solida Tractatus de Sphaera Campani Tractatus de computo maiori eiusdem Disputatio Joannis de monte regio Textus Theorice cu[m] expo[siti]one Joa[n]nis Baptiste Capuani Ptolemeus de Speculis.* [Venice: Heirs of Ottaviano Scotto I.]

Contains:

- (1) fol. 2r–3r: [Oratio on astrology by Bartholomeo Vespucci]: Bartholomaei Vesputij Flore[n]tini minimi i[n]ter artiu[m] et medicine doctores: Oratio habita in celeberrimo Gymnasio Patavino: p[ro] sui prima lectione. Anno d[omi]ni 1506. Laudes prosequens Quadrivij ac praesertim astrologie quam ibi publice profitetur.
- (2) fol. 3r: [Dedication letter of Sylvius Laurentius to Bartholomeo Vespucci]: Syluius Laurentius a Portu Caballenus: Clarissimo artiu[m] Doctori: ac Astrologie co[n]sultissimo domino Bartholomeo Vespuccio felicitatem.
- (3) fol. 3v–4r and 5r–23r: [Annotated part to the *Sphaera* by Cecco d’Ascoli]: *Cicchi Esculani viri Clarissimi in Sphaeram Mundi Enarratio.*
- (4) fol. 23v: [Dedication letter by Francesco Capuano to audience and clerics]: Ioa[n]nes Baptista Capuanus de Manfredonia Canonicus regularis suis Auditoribus dilectis et Can[on]icis Honorandis S.P.D.
- (5) fol. 23v: [Epigram by Francesco Capuano ad lectorem]: *Liber alloquitur Lectorem.*
- (6) fol. 23v: [Epigram by Constantinus Placentinus ad lectorem]: *Constantini Placentini Canonici regularis as Lectorem.*
- (7) fols. 24r–77r: [Tractatus de Sphaera, annotated by Francesco Capuano di Manfredonia]: Ioannis de Sacrobusto Astronomi celeberrimi Sphericu[m] opus cu[m] expositione D[omi]ni Joa[n]nis Baptiste Capuani de Manfredonia Canonicis regularis ordinis sancti Augustini epi[sco]pi co[n]gregationis Laterane[n]sis felicit incipit.
- (8) fol. 77v: [Introduction by Jacques Lefèvre d’Étaples, first published in 1494/1499]: *Introductoria additio. Nonnullae ad sequentia note.*
- (9) fols. 78r–91r: [Annotated Part by Jacques Lefèvre d’Étaples, first published in 1494]: *Jacobi Fabri Stapule[n]sis in Astronomicu[m] introductorium Ioannis de Sacrobosco Co[m]mentarius c[on]sequen[ter] Autoris littere: cui seruit. adiunctus. Argumentum Autoris.*
- (10) fols. 91v–104r: [Annotated by Theodosius of Bithynia, Part I: Chapter 1 & 2]: *Incipit liber primus Theodosij de sphaeris.*
- (11) fols. 104v–115v: [Annotated Part by Michael Scot]: *Eximij atq[ue] excelle[n]tissimi physico[rum] motuu[m] cursus[que]: siderei indagatoris Michaelis Scoti super Auctore sphere cu[m] qu[est]ionib[us] dilige[n]ter emendatis. Incipit expositio c[on]fecta Illustrissimi Imp[er]atoris D[omi]ni D. Federici precibus.*
- (12) fols. 116r–131v: [Annotated Part by Pierre d’Ailly, first published in 1498 – in other version]: *Revere[n]dissimi d[omi]ni Petri de Aliaco Cardinalis & ep[iscop]i Cameracensis doctorisq[ue] celebratissimi Questio p[ri]ma.*
- (13) fols. 131v–133v: [Compendium of Robert Grosseteste]: *Reverendissimi Episcopi Roberti Linconiensis Sphere Compendium.*
- (14) fols. 133v–139r: [Annotated by Theodosius of Bithynia, Part II: Chapter 3]: *Tractatus tertius Theodosii de sphaeris.*
- (15) fols. 139r–139v: [Anonym]: *De figura sectore.*
- (16) fols. 139v–143r: [Campanus of Novara]: *Tractatus de Sphaera Solida.*
- (17) fols. 143r–153v: [Blasius of Parma: *Theoricae Planetarum Co[n]clusiones & Demo[n]strationes planetarum*].
- (18) fols. 153r–158v: [Campanus of Novara]: *[Incipit] tractatus de Sphaera editus a mag[ist]ro Campano.*

- (19)fols. 159r–177r: [Computus by Campanus of Novara]: [*Incipit*] *Computus maior Campani Navariensis*.
- (20)fols. 177r–180v: [Ioannes Regiomontanus]: *Disputationu[m] Ioa[n]nis de Monte regio co[n]tra Cremonen[s]ia in planetaru[m] theoricas deliramenta*.
- (21)[Absence of fols. 181r–200v].
- (22)fols. 201r–250v: [Georg von Peurbach and Giovanni Battista (Francesco) Capuano de Manfredonia]: *Theorice nove Planetaru[m] Georgii Purbachii Astronomi Celeberrimi cu[iu]s expositione D. Ioa[n]nis Baptiste Capuani de Manfredonia Canonici regularis ordinis s[an]c[t]i Aug[usti]ni ep[iscop]i Co[n]gregationis Lateran[ensis] feliciter i[n]cipiut*.
- (23)fols. 250v–252v: [Pseudo-Ptolemy]: [*Incipit*] liber Ptolemei de Speculis dividit[ur] in duos libros.
- (24)fols. 252v–253v: [Anonym]: *Diffinitiones*. [Archimedean hydrostatics by Pseudo-Archimedes: De ponderibus archimedis et intitulatur de incidentibus in humidum????].
- (25)fols. 253v: [Ode by Johannes Baptista Bracteoli to Hieronymus Nucerelli]: *Ioannes Baptiste Bracteoli In laudem Hieronymus Nucerelli Physici Excellentis[simi] ac Medici*.

Hamel 2014, 95–96, no. 63–64. doi.org/21.11103/sphaera.101057

The copy in the database contains also an appendix with two further treatises: “Thebit de imaginatione Sphere” (PDF, 472–473) and “Theorica planetarum Ioannis Cremonensis” (PDF, 473–478).

Notes:

According to Axworthy (forthcoming) this compilation was printed three times:

- By the heirs of Ottaviano Scotto: (a) Venice, 19.01.1484 and (b) Venice, 19.01.1518.
- By Lucantonio Giunta: (c) Venice, 30.06.1518.

Title: Sphaera mundi novit[er] recognita cu[m] co[m]me[n]tariis et authorib[us] in hoc volumine co[n]te[n]tis v[ideli]cet. Cichi Eschulani cum textu. Ioannis Baptistae Capuani. Iacobi Fabri Stapulensis. Theodosii de Spheris cum textu. Michaelis Scoti questiones. Petri de Aliaco Cardinalis Quaestiones. Roberti Linconiensis Compendium. Theodosii iterum de sphaeris cum textu. Tractatus de Sphaera solida. Theoricae planetarum conclusiones cum expositione. Campani tractatus de Sphaera. Eiusdem tractatus de computo maiori. Ioannis de monte regio in cremone[n]sem disputatio. Theorice Textus cu[m] Ioa[n]nis Baptiste Capuani expo[siti]one. Ptolemaeus de Speculis. Theorica Planetarum Ioannis Cremonensis: plurimum faciens ad disputationem Ioannis de monte regio: quam in alijs hactenus i[m]pressis non reperies.

[doi.org/21.11103/sphaera.100047].

As the differences of both 1518 editions will be shown in detail by Axworthy (forthcoming), we will not list them here. For further literature see (Dell’Anna 1991a, 1991b, 1993).

Sacrobosco, Johannes de. 1518. Opusculu[m] de Sphaera clarissimi philosophi Ioannis de Sacro busto. Theoricae planetaru[m] excellentissimi Astronomi Georgii Purbachii Magistri Viennensis, quo Ioannes de Monte regio olim usus est praeceptore. FIGVrae item summa diligentia suis ubiq[ue] locis appositae, ex quibus perfacile autoris sensus utrobq[ue] intelligi potest.). Viennae Pannoniae: per IOanne[m] Singrenium. Expensis vero LVcae Alantsae Bibliop. Viennen[sis]. [Johann Singriener d. J. & Lukas Alantsee]

Contains:

- (1) fol. a1v: [Carmen by Philippus Gundelius to the students in astronomy]: *PHILIPPVS GVNDELIVS ASTRONOMIAE studiosis*.
- (2) fol. a2r–g3v: *TRACTATVS DE SPHAERA VENERABILIS uiri, Magistri Ioannis de sacro busto*.
- (3) fol. g3r–n5v: *Theoricae Novae Planetaru[m] Georgii Purbachii astronomi Vienn[en]sis celebratiss[ime]*.

Hamel 2014, 96–97, no. 65. doi.org/21.11103/sphaera.100883

Zentralbibliothek, Zurich, Druckschriften RY 318,5: <http://www.e-rara.ch/zuz/content/titelform/4065768>

Austrian National Library, Vienna, Cod. ser. nov. 4265, fol. fols. 118r–191v and http://digital.onb.ac.at/OnbViewer/viewer.faces?doc=ABO_%2BZ178845904

Note: This edition does not contain the disputatio of Regiomontanus!

Sacrobosco, Johannes de. 1519. SPHERAE MVNDI COMPENDIVM FOELICITER INCHOAT. Nouitiis a adolesce[n]tib[us]: ad astronomica[m] re[m]pu[blicam] capessenda[m] additu[m] impetra[n]tibus: p[ro] breui rectoq[ue] tramite a vulgari vestigio se moto: loa[n]nis de sacro busto sphericu[m] opusculum vna cu[m] additionib[us] no[n]nullis littera A sparsim vbi interserte sint signatis Co[n]traq[ue] Cremonen[sia] in planetaru[m] theoricas deliramenta loa[n]nis de mo[n]te regio disputationes tam acuratis[simam]. qua[m] vtilis[simam]: Nec no[n] Georgii purbachii: in eorundem motus planetaru[m] accuratis[simam]. theorice: dicatu[m] opus vtili serie contextum: fausto sidere inchoat. Venetiis: p[er] Iacobu[m] pe[n]tiu[m] de Leucho [Giacomo Penzio].

Contains:

- (1) fols. 2r–21v: [Tractatus de Sphaera, annotated part by Anonymus]: *Tractatum DE SPHAERA quattuor capitulis distinguim[us]*.
- (2) fols. 22r–30v: *Disputationem Ioannis de monte Regio contra Cremonensia in planetarum Theoricas deliramenta praefatio*.
- (3) fols. 30v–47v: *Theoricae novae planetarum Georgii Purbachii astronomi celebratiss[imi]*.

Hamel 2014, 97, no. 68. doi.org/21.11103/sphaera.100992

Sacrobosco, Johannes de. 1531. Sphaerae tractatvs. Ioannis de Sacro Bvsto Anglici viri clariss[imi]. Gerardi Cremonensis theoricae planetarvm veteres. Georgii Purbachii theoricae planetarvm novae. Prosdocimi de beldomando patauini super tractatu sphaerico commentaria, nup[er] in lucem diducta per. L. GA. nunq[ue] amplius i[m]pressa. Ioannis baptistae capuani sipontini expositio in sphaera & theoreticis. Ioannis de monte regio disputationes contra theoreticas gerardi. Michaelis scoti expositio brevis & quaestiones in sphaera. Iacobi fabri stapulensis paraphrases & annotationes. Campani co[m]pendium super tractatu de sphaera. Eiusdem tractatulus de modo fabricandi spheram solidam. Petri cardin[alis] de aliaco epi[scopus] cameracensis. 14. Quaestiones. Roberti linconiensis epi[scopus] tractatulus de sphaera. Bartholomei uestutii glossule in plerisq[ue] locis sphaere. Eiusdem oratio. De laudibus astrologie. Lucę Gaurici castigaciones & figure[m] toto opere dilige[n]tissime reformatę. Eiusde[m] questio Nunquid sub aequatore sit habitatio. Eiusde[m] Oratio de inue[n]toribus & laudibus Astrologie. Reuerendissimo cardin[alis] ep[iscop]o. D. Bernardo Tridentinor principi dicata. Alpetragii Arabi theorica planetarvm nvperrime Latinis mandata literis a calo calonymos hebreo neapolitano, ubi nititur saluare apparentias in motibus Planetarum absq[ue] eccentricis & epicyclis.

Hamel 2014, 100–101, no. 80. doi.org/21.11103/sphaera.100999

This compedium, printed in Venice by Lucantonio Giunta, will be described in detail by Axworthy (forthcoming).

Sacrobosco, Johannes de. 1569. ERASMI OSVALDI SCHRECKENFUCHSII Commentaria, in SPHAERAM IOANNIS DE SACROBVSTO, ACCVRATISSIMA, QVIBVS NON SOLVM EA QVAE IN autoris contextu sunt, sed alia etiam ad Sphaericam doctrinam necessaria, explicantur: Tabularumq[ue] constructio, ex suis principijs per demonstrationum seriem clarę dilucideq[ue] docetur. HIS ADIECTI SVNT EIVSDEM AVTORIS CANONES, quibus usus Tabularum, quae operi ex libro Directionum Ioannis Regiomontani, passim inseruntur, ad pulcherrimas inquisitiones Astronomicas, luculentissimę continentur. Reliqua ad consummatam doctrinam hanc pertinentia, ex illum PRIMO MOBILI, eadem forma edito, petes.

Basileae: Ex officina Henric Petrina [Heinrich Petri].

Hamel 2014, 118, no. 153. doi.org/21.11103/sphaera.101080

Contains:

- (1) fol. a1v: [Greek Carmen by Johann Hartung to Schreckenfuchs]: *IN D. OSVALDI SCHRECKENVCHSII DOCTISSIMA SCHOLIA IN SPHAERAS. Ioannes Hartungus.*
- (2) fol. a1v: *IN ERASMI OSWALDI SCHRECKENFUCHSII, apud Friburgum Brisgoiae Mathematicos Professionis, commentaria quae in Sphaeram materialem scripsit, carmen [...].*
- (3) fol. a1v: [Carmen by Johannes Städler]: *M. IOANNES STADLERVS AVGVSTANVS.*
- (4) fols. a2r–a4r: [Dedication letter of Schreckenfuchs to Iacobo Curtio]: *HUMANISS. ATque pientissimo uiro, D. Iacobo Curtio, VTRIVSQVE IVRIS DOCTORI EMINENTISS. ECCLESIAE CATHEDRALIS Constantiae, Canonico, uitae sanctimonia celeberrimo, Eras. Osualdus Schreckenfuchsius Austrius S. D.*
- (5) pp. 1–290: [Annotated Part by Schreckenfuchs]: *COMMENTARIA ERASMI OSVALDI SCHRECKENVCHSII IN SPHAERAM IOANNIS de Sacro Busto.*
- (6) pp. 290–[315]: [Canons on the Use of the Astronomic Tables]: *CANONES IN omnes Tabulas, quae Commentariis Sphaerae insertae svnt.*

Note: This edition does not contain the planetary theory of Regiomontanus!

Sacrobosco, Johannes de. 1583. *Specvlvm Astrologiae, Comprehendens Commentaria in Theoricis Planetarvm, et in Sphaeram Ioannis de Sacro Bosco: Vnà cum tabulis de Eclipsibus Georgii Purbachii, & supputationibus motuum Planetarum, secundum decreta Alphonsii Regis Hispaniae: & Nicolai Copernici, cum diuersis aliis tractatibus Astrologicis.* Avtore Francisco Ivnctino Florentini S.T.D. ac Eleemosynario ordinario Serenissimi Principis Francisci Valesii, Henrici filij, Francisci Nepotis, ac Christianiß Francoru[m], ac Poloniae Regis fratris vnici, Andegauensis Ducis, &c. Saluo per omnia iudicio sanctae sedis Apostolicae. Tomvs posterior. Ludguni: In Officina Q. Phil. Tinghi, Florentini [Lyon, by Symphorien Béraud].

Hamel 2014, 124, no. 181. doi.org/21.11103/sphaera.101101.

Contains (in total 24 parts):

- (1) fols. 3–5: [Dedication letter by Francesco Giuntini to Gasparus Arlunus, 1581]: *ADMODUM NOBILI AC OMNI GENERE VIRTVTIS INSIGNITO D. GASPARI ARLVNO PATRITIO MEDIOLANENSI, FRANCISCVS IVNCTINVS FLORENTINVS THEOLOGVS. S. P. D.*
- (2) fol. 6: [Poetry: Distich on Giuntini]: *IN FRANCISCVM IVNCTINUM ASTROLOGVM CELEBERRIMVM.*
- (3) fol. 6: [Poetry: Octostichon by Johannes Chevignaeus of Beaunois; another version apperas already in 1577!]: *In theoricis planetarum, doctissimis D. Francisci Ivnctini lucubrationibus explicatas, Ioannis Chevignaei Belnen[sis] OKTOΣTIXON.*
- (4) fols. 7–534: *GEORGII PVRBACHII ASTRONOMI CELEBERIMI THEORICAE PLANETARVM LIBER, COMENTARIIS FRANCISCI IVNCTINI Theologi, ac Mathematici peritissimi illustratus.*
- (5) fols. 535–636: *FRANCISCI IVNCTINI FLORENTINI SACRAE THEOLOGIAE DOCTORIS, Commentaria in Sphaeram Ioannis de Sacro Bosco accuratissima.*
- (6) fol. 536: [Dedication letter by Giuntini to Francesco Spina]: *D. FRANCISCO SPINAE, VIRO CLARISSIMO, NOBILITATE GENERIS, magnanimitatéque praestanti, nationis Florentinae Consuli in Lugdunensi ciuitate meritissimo, Franciscus Ivnctinus salutem & nominis immortalitatem D.*
- (7) fols. 637–746: *FRANCISCI IVNCTINI FLORENTINI SACRAE THEOLOGIAE DOCTORIS. In Capitulum Secundum Sphaerae Ioannis de Sacro Bosco Commentarius.*
- (8) fols. 747–854: *FRANCISCI IVNCTINI FLORENTINI SACRAE THEOLOGIAE DOCTORIS, Commentaria in tertium Capitulum Sphaerae Ioannis de Sacro Bosco.*
- (9) fol. 748: [Preface by Giuntini, dedicated to Marco Bonavolta]: *AD HVMANISSIMVM NOBILEMQVE D. MARCVM BONAULTAM FLORENTINVM, FRANCISCI IVNCTINI THEOLOGIAE Doctoris, in tertium capitulum Sphaerae Ioannis de Sacro Bosco, Praefatio.*
- (10) fols. 855–916: *FRANCISCI IVNCTINI FLORENTINI SACRAE THEOLOGIAE DOCTORIS, Commentaria in quartum Capitulum Sphaerae Ioannis de Sacro Bosco.*
- (11) fols. 904–906: [Two treatises on Eclipses, attributed to Proclus]: *DE EXLIPTIBVS EX PROCLO.*
- (12) fols. 906–913: [Various calendaric and astronomical calculations]: *Novilunium per Epactam facile computare.*

- (13) fols. 913–915: *PETRI NONII SALASIENSIS annotatio in extrema verba capitis de Climatibus, Elia Vineto interprete.*
- (14) fol. 915: [excerpt of the third book of the Epitome of Ptolemy's *Almagest* by Regiomontanus]: *EXPOSITIO XXII. EX LIBRO TERTIO EPITOMAE IOANNIS DE REGIO MONTE IN ALMAGESTUM PTOLEMAEI* [this excerpt was printed in the reception of the *Sphaera* according to the database altogether 85 times from 1531 to 1629!]
- (15) fol. 916: [Elements of Astronomy (Liber de aggregatione stellarum) by al-Fargānī, Aḥmad Ibn-Muḥammad, Part Fragment by John of Seville]: *EX ALFRAGANO DE ORTU & OCCASU PLANETARUM, & DE OCCULTATIONIBUS EORUM SUB RADIIS SOLIS. Differ. 24.*
- (16) fol. 917: [Epilogue by Giuntini, dedicated to Franciscus Renuatus and Knight Imbertu]: *AD D. FRANCISCVM RENATVM, ARCIS LUGDVNENSIS SIGNIFERVM, ET D. IMBERTVM Equitem Melitensem Salutios Fratres, Francisci Iunctini Peroratio.*
- (17) fols. 918–932: [Calendaric treatise by Francesco Giuntini]: *SYNOPSIS DE RESTITVTIONE CALENDARII. Authore Francisco Iunctino Florentino, sacrae Theologiae Doctore: Ad sereniss[imum] Principem Ducem Andegauensem & Alenconium, fratrem vnicum Christianiss[imum] Regis Francorum.*
- (18) fols. 933–1076 [1105]: [Compendium on the observations of fixed stars by Giuntini]: *COMPENDIUM DE STELLARVM FIXARVM OBSERVATIONIBVS. Opus Mathematicae studiosis vtilissimum, ab Auctore recognitum, ac locupletatum. Auctore Francisco Iunctino Florentino, sacrae Theologiae doctore, ac Eleemosynario Serenissimi Principis FRANCISCI Valesii Christianissimi Francorum ac Poloniae regis Fratris unci, Andegavensis, Alenconiorum &c. Ducis[imum].*
- (19) fols. 1077–1081: *HIPPOCRATES DE SIGNIFICATIONE MORTIS, & vitae, secundum motum Lunae, & aspectus Planetarum.*
- (20) fols. 1106–1123: [Astrological treatise on lunar eclipses by Giuntini]: *PARAPHRASES ET ANNOTATIONES IN CLAVDII PTOLEMAEI Alexandrini enunciatum 24 Centiloquii super luminum eclipsibus.*
- (21) fols. 1124–1140: [Astrological treatise on comets by Giuntini]: *ANNOTATIONES IN COMETIS, quas Mundus nunquam impunè vidit: ex obseruationibus veterum Astrologorum.*
- (22) fols. 1140–1167: [Astrological calendar by Giuntini]: *CALENDARIVM ASTROLOGICVM, HISTORICVM ET POETICVM, ex omnium nationum annalibus, Chronicis, & Historijs, magna diligentia excerptum. In quo singulorum dierum, aeris co[n]stitutiones, Pontificum, Imperatorum, Regum, Principum, virorumq[ue] illustrium nativitates & obitus, breuiter & dilucidè continentur. Omnibus Historiarum amatoribus, singulis diebus lectu iucundum & vtilissimum.*
- (23) fols. 1168–1197: [Epilogue by Giuntini, dedicated to Michael Antonius Salutius]: *AD CLARISSIMVM, ILLVSTRISSIMVMQUE VIRVM, MICHAELM ANTONIVM Salutium Mantae Dominum, apud Christianissimum Regem amplissimi ordinis Equitem, Legionariorum militum trans Alpes, ac Lugdunensis Arcis Regium praefectum, Francisci Iunctini Theologi Florentini peroratio.*
- (24) fol. 1171: [Poetry: Poem by Antonius Armandus dedicated to Michael Antonius Salutius]: *AD MICHAELM ANTONIVM SALVTIVM MANTAE DOMINVM, REGII ordinis Equitem, & Lugdunensis Arcis Praefectum, &c. Antonius Armandus Medicus.*

Sacrobosco, Johannes de. 1616. *DE SPHAERA, SEU PRIMI MOBILIS RUDIMENTIS LIBELLUS Ad usum Scholarum maximè accomodatus: accurata methodo & breuitate conscriptus M. THOMAE BLEBELIO BUDISSINO. Et nunc ab infinitis propè mendis liberatus, Tabulisq[ue] correctis instructus. Adjectus ad calcem est Canon Sinuum Ioh. Regiomontani, ad semidiametrum 10000000. VVittenbergae: Typis Kelnerianis, Impensis Haeredum Samuel Selfisch [published by the heirs of Samuel Selfisch. As Andreas Kelner was active only until 1591, it probably was printed by his heirs].*

Hamel 2014, 60. doi.org/21.11103/sphaera.100453

Contains (cf. editions from 1576 onwards):

- (1) fols. a2r–a2v: [Letter by Bartholomäus Schönborn to Blebel]: *DOCTRINA ET VIRTUTE ORNATISSIMO VIRO DN. M[AGISTRO] THOMAE BLEBELIO, Concrectori Ludii Curiensis, amico suo carissimo S. D.*

- (2) fols. a3r–c1v: [Dedication letter of Blebel to his pupils]: *INGENIUS ET BONA INDOLE AD VIRTUTEM PRAEDITIS Adolescentibus, prima pietatis, artium & linguarum elementa in Schola Curiana feliciter discentibus, Filijs, & Discipulis suis charissimis. S.P.D. M. Thomas Blebelius.*
- (3) fols. 1–129: [Blebel's four books on the *Sphaera*]: *DE SPHAERA LIBER [PRIMUS – QUARTUS].*
- (4) fols. 130–152: [Blebel's treatise to calculate distances between places]: *METHODUS DE distantiiis locorum, in terra computandis.*
- (5) fols. 153–162: [Table of latitude and longitude of various cities]: *TABULA LONGITUDINIS ET LATITUDINIS QUARUNDAM CIVITATUM SECUNDUM ordinem Alphabeti disposita.*
- (6) fols. 163–178: [Various astronomical tables connected to Blebel's treatise]: *TABULAE OSTENDENTES INGRESSUM SOLIS IN XII. SIGNA ZODIACI AD SINGULOS DIES ANNI prisci seculi: Item cum quoto Eclipticae gradu stellae insigniores olim oriebantur & occidebant. ITEM. Ascensionem Rectarum & Obliquarum ad Elevationem poli 51 & 52 Grad. Adiectae sunt Tabulae Declinationis Solis. Item maximorum Dierum ad singulas elevationes Poli. Ac denique convertendi horas & horarum Minuta in Gradus & Minuta AEquinoctialis.* [This treatise was first published in 1588].
- (7) fols. 179–206: [Calendar and table on the position of the fixed stars connected to Blebel's treatise]: *CALENDARIUM POETICUM GENERALE, EXHIBENS PRAECIPUARUM STELLARUM fixarum, cum vero loco Solis, Ortus & Occasus, Matutinos ac Vespertinos, ad singulos dies totius anni, in elevatione poli 51 graduum conscriptum à M. THOMA BLEBELIO Budißino. Adjecta est in fine Tabula generalis, exhibens praecipuarum Stellarum fixarum Longitudines, Latitudines, Delcinationes & Magni[tu]dines.* [These tables were first published in 1588].
- (8) fols. 207–252: [Sine panel by Regiomontanus]: *CANON SINVVM Iohannis Regiomontani Ad Semidiam: 10000000.* [only in 1616 & in 1629].

Sacrobosco, Johannes de. 1629. *DE SPHAERA, SEU PRIMI MOBILIS RUDIMENTIS LIBELLUS. Ad usum Scholarum maximè accomodatus: accurata methodo & brevitate conscriptus M. THOMA BLEBELIO BUDISSIONO. Et nunc ab infinitis propè mendis liberatus, Tabulisq[ue] correctis instructus. Adjectus ad calcem est Canon Sinuum Joh. Regiomontani, ad semidiametrum 10000000. Witenbergae: Typis Fincelianis, Impensis Haeredum Samuel Selfisch.* [published by the heirs of Samuel Selfisch and printed by Hiob Wilhelm Fincelius].

Hamel 2014, 60. doi.org/21.11103/sphaera.100455

As this edition is very close to the one of 1616 we do not list here the single parts.

Treatises of the *Sphaera* which claim to contain Peurbach/Regiomontanus, but do not

Even if announced on the title pages of the following prints (published between 1489 and 1515), the *Theoricae* by Peurbach and the *Disputationum* by Regiomontanus against Gerard's *Theoricae* – due to an analyze on the PDFs in the database – are **NOT** part of the following editions of *De Sphaera*. They build a special group in the reception, as they contain only the uncommented treatise of Sacrobosco, that were written by an unknown author. The printing plates probably were lent between the publishers and so circulated between Paris and Strasbourg:

Sacrobosco, Johannes de. 1489. *NOVITIIS ADOLESCENTIBVS: AD ASTRONOMICA[m] rempu[blicam]. capessenda[m] additu[m] impetra[n]tib[us]: p[ro] breui rectoq[ue] tramite a vulgari vestigio semoto. Ioha[n]nis de sacro busto sphericu[m] opusculu[m] Georgiiq[ue] Purbachii in motus planetar[um] accuratiss[ime] theorice Necno[n] co[n]tra Cremone[n]sia in eoru[m]de[m] planetar[um] theoricas delirame[n]ta Ioha[n]nis de mo[n]te regio disputatio[n]es tam accuratiss. q[uam] utilis. dicatu[m] opus vtili serie co[n]textu[m] inchoat.* [Paris]: per me Vuolffgangu[m] hopill [Wolfgang Hopyl].

Hamel 2014, 78, No. 14; doi.org/21.11103/sphaera.100821

Sacrobosco, Johannes de. 1490. Tractatus de sphaera. Nouitiis adolescentibus ad astronomica[m] rempu[blicam] capesse[n]da[m] aditu[m] impetra[n]tib[us]: p[ro] breui rectoq[ue] tramite a vulgari vestigio semoto. Ioh[an]is de sacro busto sphericu[m] opuscul[um]. Georgijq[ue] Curbachij [sic!] in mot[us] planetar[um] accuratiss[ime] theorice Necno[n] contra Cremonensia in eoru[n]de[m] planetar[um] theoricas deliramenta Johannis de monte regio disputatio[n]es ta[m] accuratiss. q[uam] vtiliss.: dicatu[m] opus vtili serie co[n]textum inchoat. [Strasbourg: in officina Henrici Stephani calchographi//Martin Flach I.].

Hamel 2014, 78, No. 15; doi.org/21.11103/sphaera.100823

The only known copy is preserved in the Library of the London Oratory, No. 12456 [fragmentary?].

Sacrobosco, Johannes de. 1493. Tractatus De Sphaera. Nouitiis adolescentibus ad astronomica[m] rempu[blicam] capesse[n]da[m] additu[m] impetra[n]tib[us]: p[ro] breui rectoq[ue] tramite a vulgari vestigio semoto. Ioh[annes] de sac[r]o busto sphericu[m] op[us]culu[m] Georgijq[ue] Curbachii [sic!] in mot[us] planetar[um] accuratiss[ime] theorice. Necno[n] contra Cremonensia i[n] eor[un]de[m] planetar[um] theoricas de lirama[n]ta Joha[n]nis de monte regio disputatio[n]es ta[m] accuratiss. q[uam] vtiliss. dicatu[m] op[us] vtili serie contextu[m] inchoat. Paris: Georgius Mittelhvs.

Hamel 2014, 80, No. 21; doi.org/21.11103/sphaera.101125

The only known copy is preserved in the University Library of Munich (4 inc. lat. 310_6).

<http://data.cerl.org/istc/ij00411000> and <https://epub.ub.uni-muenchen.de/11720/>

Sacrobosco, Johannes de. [1493]. Tractatus de sphaera. Nouitiis adolesce[n]tibus ad astronomica[m] re[m]pu[blicam] capescendam additu[m] impetra[n]tib[us]: pro breui rectoq[ue] tramite a vulgari vestigio semoto. Ioha[n]is de sacro busto sphericu[m] opusculu[m]. Georgijq[ue] Curbachii [sic!] in motus planetar[um] accuratiss[ime] theorice Necno[n] contra Cremonensia i[n] eoru[n]de[m] planetar[um] theoricas delirame[n]ta Joh[ann]is de monte regio disputat[i]o[n]es ta[m] accuratiss. q[uam] vtiliss.: dicatu[m] op[us] vtili serie c[on]textum i[n]choat. [Paris: Antoine Caillaut].

Hamel 1924, 80–81, No. 22; doi.org/21.11103/sphaera.100825

The only known copy is preserved in the Bibliothèque Municipale de Bourges: Inc 159 Rec 271 p 12.

Sacrobosco, Johannes de. [1494]. Tractatus de Sphaera. Nouitiis adolescentibus ad astronomica[m] re[m]pu[blicam] capescendam aditum i[m]petrantibus: pro breui rectoq[ue] tramite a vulgari vestigio semoto. Iohannis de sacro busto sphericu[m] opusculu[m] Georgijq[ue] Curbachij [sic!] in motus planetar[um] accuratiss[ime] theorice: necnon co[n]tra cremonensia in eorumde[m] planetar[um] theoricas deliramenta Joh[an]is de monte regio disputationes ta[m] accuratiss. q[uam] vtiliss. dicatum opus vtili serie contextum inchoat. Paris: Félix Baligavlt.

doi.org/21.11103/sphaera.100270

The copy in the British Library: IA.40494 is not complete. The Disputatio against Gerard of Cremona by Regiomontanus as well as the *Theoricae novae* by Peurbach are announced at the beginning, but the text contains only the original tract of Sacrobosco. Other exemplars can be found in New York Public Library and Oxford Bodleian Library.

Sacrobosco, Johannes de. 1515. TRACTATUS DE SPHERV. NOUITIIS | AD OLESCENTIBVS AD ASTRONOMICAM rem publicam capescendam aditum impreta[n]tibus: pro breui rectoq[ue] tramite a vulgari vestigio semoto. Iohannis de sacro busto sphericu[m] opusculu[m] Georgijq[ue] Purbachij in motus planetarum accuratiss[ime] theorice: necnon contra cremonensia in eorundem planetarum theoricas deliramenta Iohannis de monte regio disputationes tam accuratiss. q[uam] vtiliss. dicatum opus utili serie contextum inchoat. Paris: Frères de Marnef.

doi.org/21.11103/sphaera.100989

<http://gallica.bnf.fr/ark:/12148/bpt6k859370n.r=Tractatus%20de%20sphaera?rk=64378;0>

Note: The illustration of a globe and a lion appears for the first time in the Paris edition of 1498 (published by Jean Petit I and printed by Guy Marchant). See Hamel 2014, 82–83, No. 29. Online available at: <http://mdc.cbuc.cat/cdm/ref/collection/incunableBC/id/48374>

Biography Dr. Thomas Horst

Thomas Horst (CIUHCT/FCUL, University of Lisbon) studied History and Anthropology at the Universities of Munich and Vienna. In 2003 and 2005 he carried out twice an ethnological field research on the descendants of the Mundurukú Indians in the Amazon region (Brazil). After his PhD Thomas specialized in the analysis of old globes (2010 “Fiorini-Haardt-Prize”) and maps (2012 “Georges Erhard Prize of the Société de Géographie” for his book about the atlas of Gerhard Mercator). He is editor of the book review section for the International Journal for the History of Cartography, *Imago Mundi*, and contributing special editor for *ISIS CB* for “History of Cosmography: Maps, Atlases, Globes, Instruments and Texts” (2018–2020). From October 2017 to February 2018 he was Visiting Postdoctoral Fellow at the MPIWG in Berlin.

He is also connected with the Institute of Geodesy at the Bundeswehr University in Munich. Occasionally, he gives courses within the frame of the Studium Plus in Neubiberg (<https://www.unibw.de/zentralinstitut-studiumplus/lehre/seminare/dozentinnen-und-dozenten/thomas-horst>) as well as at the Historical Institute, Dept. Auxiliary Sciences of History at the Ludwig Maximilians University in Munich (https://www.hgw.geschichte.uni-muenchen.de/personen/lehrbeauftragte/thomas_horst/index.html).

His main areas of interest include the history of early modern science (in particularly cosmography, cartography and instruments as globes), climate history, the history of the relations between Portugal and Germany in the Early Modern Period as well as cultural anthropology.

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