T he exhibition contains an example of the first printed edition of Ptolemy's Almagest (Venice, 1515) [1], the most important and influential astronomical treatise to survive from antiquity. It was produced by Peter Lieferinck, a German printer, who established a press in Venice towards the end of the 15th century. He was from Cologne, an early centre for printing (where England’s first printer, William Caxton, had learnt the trade) and had printed works of astronomy and astrology. The Latin translation of Almagest had been made from Arabic by Gerard of Cremona in the 12th century. Also on display is [16] is one of the most remarkable embodiments of the Ptolemaic planetary system, with its combinations of circles for calculating the positions of the planets, wandering on a sphere, the sphere of the earth, and the sphere around the sun. This is the Astronomicon Caesareum of Peter Apian, mathematician and cosmographer of Ingolstadt, who, like a number of the principal practitioners themselves. In an exhibition, however, it may be necessary to make sense of the working lives of the practitioners themselves. For example, Copernicus must still have to astronomy, of course, and practitioners – were the essence of the story told here. Copernicus had a large input and an emotional influence, not least because his printed instruments could be produced in numbers and distributed cheaply. Hartmann was another mathematical wizard who was a printer and a globe- and instrument-maker. The exhibition also has a brass astrolabe by Hartmann [9], made in Nuremberg in 1527, and from the same city, an astrolabe by Johann Wagner [10] and portable sundials by Gerhard Mercator [11]. Hartmann’s workshop and print shop of Georg Hartmann had a large output and a wide distribution in England. It is evident at every turn in the material record of Renaissance astronomy. The objects, books, globes, and instruments – were made by craftsmen in workshops and were enjoyed and used by those that valued them as sites of astronomical practice.

An exhibition by the Royal Astronomical Society and the Museum of the History of Science to mark the 500th anniversary of the birth of Gerhard Mercator

We can see Mercator’s career as an embodiment of notions of honesty and skill. He was a cartographer, cosmographer, astronomer, engraver print and instrument maker and this may be the role that he worked on. But is it the role that he worked on? There is an exhibition. In this exhibition, however, it may be necessary to make sense of the working lives of the practitioners themselves.

Thought and theory are integral to astronomy, of course, and to have a part of the story told, Copernicus must still have a central role. But presenting him in an exhibition. However necessary to make sense of the narrative, it is not the narrative to which most people can, however, be assured. Exhibitions are used to presenting objects, and craft is valued as an ending. In the material record of Renaissance astronomy. The objects, books, globes, and instruments – were made by craftsmen in workshops and were enjoyed and used by those that valued them as sites of astronomical practice.

Books, Globes and Instruments in the Exhibition

1. Claudius Ptolemy, Almagest (Venice, 1515)
2. Johann Stöfler, Astronomia enigmatica (Oppenheim, 1513)
3. Paper astrolabe by Peter Jordan, Mainz, 1535, included in his edition of Stöffler’s Elucidatio
4. Armillary sphere by Carlo Plato, 1588, Rome, MHS inventory no. 3458
5. Claudius Ptolemy, Almagest (Venice, 1515) [1], the first printed edition of Ptolemy’s original astronomical work.

Claudius Ptolemy: Astronomy and Cosmography

Claudius Ptolemy’s (c. 100 – c. 170 AD) Almagest is a landmark astronomical text that was the standard work for over 1500 years, and its influence can be seen in the development of many later works. Ptolemy’s work was based on the work of earlier Greek astronomers, but it introduced new ideas and methods that were to have a profound impact on the development of astronomy. He was a prolific writer, and his works were widely translated and studied in the Middle East and Europe.

The Almagest is divided into three parts: the first part deals with the geometry of the celestial sphere and the second part with the motions of the heavenly bodies. The third part is an astronomical atlas that includes tables of the positions of the stars. Ptolemy’s table of stellar positions was used by astronomers for centuries and was a major influence on the development of the astrolabe, an instrument used to determine the positions of stars and other celestial objects.

The Almagest was not only a scientific work but also a philosophical one, and it played an important role in the development of the Islamic world’s understanding of the universe. Ptolemy’s work was translated into Arabic, and his ideas were studied and expanded upon by later Islamic astronomers.

The Almagest was also influential in the development of Western science, and its ideas were incorporated into the work of later astronomers such as Tycho Brahe and Galileo Galilei. The Almagest remains a fundamental text in the study of ancient astronomy, and its ideas continue to influence the development of modern astronomy.

Johann Stöfler and the Astrolabe

Johann Stöfler (1470–1555) was a German mathematician, cartographer, and cosmographer who made significant contributions to the field of astronomy. He was born in Freiburg im Breisgau, in the Holy Roman Empire, and he created many astronomical instruments, including the astrolabe.

Stöfler’s work on the astrolabe was based on the work of earlier astronomers, such as Ptolemy and Al-Battani. He made significant improvements to the astrolabe, including the use of a transparent glass plate to allow the observer to see the stars through the instrument. This allowed for greater accuracy in the determination of the positions of celestial objects.

Stöfler’s work on the astrolabe was not only important in terms of its scientific contributions but also in terms of its role in the dissemination of astronomical knowledge. His astrolabe was widely used and was reproduced in many different versions throughout Europe.

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Johann Schöner was a mathematician, astronomer, cosmographer, printer and globe-maker of great influence and importance in the early 16th century. Born in Karlstadt near Würzburg, he was a priest in Bamberg, where he had a printing press and produced maps and globes, and from 1526 he taught mathematics in Nuremberg, where he became a Protestant.

It was in Nuremberg that Schöner befriended, as a guest in his home, a young mathematics professor from the Lutheran stronghold of Wittenberg, Georg Joachim Rheticus. When Rheticus made his famous journey north toFrauenburg, where Nicolaus Copernicus was a canon of the cathedral and was known for his new astronomical theory, he was persuaded to do so by Schöner and encouraged by Georg Hartmann. He brought a letter of introduction from Schöner and among the books he took as presents were Fidension's Alleged and Schöner's edition of Regiomontanus's tract De triangulis.

One of the outstanding objects in the exhibition is the celestial globe made by Schöner in 1534. [6]. It is one of only two examples of the earliest extant printed celestial globe, this one being mounted in a stand dated 1535. The woodcut from which they were printed had been completed by 1533. Like many of the books on display, it is on loan from the Royal Astronomical Society, but unlike the globe, the book is not scheduled to return to the end of the exhibition but will remain on display in Oxford. It is not Schöner's first printed globe: he made smaller celestial and terrestrial globes in 1515 as a pair, indeed the first pair of globes ever produced. Paring a celestial and a terrestrial in this way created a new invention in cosmography, in its attempt to deal with the relationship between the heavens and the earth. No example of the 1515 celestial globe survives.

The celestial globe of 1534 also had a terrestrial companion and Schöner published short texts describing them in 1535. A rare example of the tract on the celestial globe [6], Globus stellaris, on opposite sternium stellorum us et appellium, shows the woodcut of the stand, which coincides closely with the globe on a display label, included in Schöner’s Opus mathematicum of 1561, adds the constellations to the surface [6].

The copy of Schöner’s Tabularium astronomiae of 1536 [7] illustrates the connections of 16th century astronomy its important position in Information Germany. To this tabula Schöner adds a tract by Regiomontanus. A commentary preface addressed to Schöner is a contribution to the leading theologian Theobald and scholar Philipp Melanchthon. The book was published in Nuremberg by the celebrated printer Johannes Petreius, who had collaborated with Schöner as his editor on a number of mathematical works, including other tracts by Regiomontanus.

Melanchthon had been a student of Johann Stöffler and contributed a poem to the Elucidatio, his master's book on the astrolabe. He had instruments by Hartmann. Christian Horen had been a pupil of Melanchthon in Wittenberg and presented him with a sundial in 1533, the year he made the quadrant on display [25]. Melanchthon taught and encouraged Horen, inviting him to his chair in Wittenberg. He composed the inscription for Schöner’s tomb in Nuremberg, when he died in 1547.

C opernicus permitted Rheticus to publish a first edition, the Nuremberg copy of his treatise in which he argued that the earth is a planet moving annually around a central sun and rotating daily as it moved. The tract was addressed to Schöner, whose name appears with that of Copernicus on the title-page of 1540. On display in the exhibition [16] is the version that accompanied the second edition of De revolutionibus, published in Basel in 1566. De revolutionibus orbium coelestium is a novel cosmography, in its attempt to deal with the relationship between the heavens and the earth. No example of the 1515 celestial globe survives.

The astronomers who came later in the exhibition display a range of responses to the Copernican hypothesis but, as it happens, although there were a very few wholehearted affirmations of the Copernican cosmology (as a physical truth and not just a mathematical hypothesis), no such author is represented here: Eusebius Reinhold, for example, who had been appointed by Melanchthon to the astronomy chair in Wittenberg, published up-to-date astronomical tables, his Prutenische tabulae coelestium motuum in 1551 [24], having used Copernicus’s theory for his calculations but without accepting its physical truth.