
**Giotto's Sky:
The Fresco Paintings of the First Floor Salone
of the Palazzo della Ragione, Padua, Italy**

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Abstract

Giotto's frescos in the Salone of the Palazzo della Ragione, Padua, were painted across three registers. The upper register contains celestial astronomical imagery that few scholars have been able fully to understand. Using two sections of this upper register as case studies, I reconstructed the skies over Padua in the medieval period using astronomical and astrological software, together with the knowledge of poetic astronomy and naked eye astronomy. This approach showed that, rather than being simple decorations, these images are instead reflective of the constellations that dictated the seasons and the cycle of the year as seen over Padua c. 1309. Furthermore, they reveal a night sky that was populated with a constellational iconography that, I argue, was part of an ensouled cosmology.

Keywords

Art history, cosmology, medieval period, cultural astrology, Padua, Pietro d'Abano, constellational imagery

Introduction

There is often an assumption that documents constitute what is written and that textual documents alone give us primary information about the way people thought about their world. Yet non-textual documents, such

as images, can and should also influence how we understand a period or culture. This becomes extremely important in the area of art history, for which primary source materials consist not only of manuscripts but also buildings, frescoes, stained glass, mosaics, and sculpture (the arts of carving and casting).

There is another type of primary source material, however, that provides us with visual information, often ignored yet universally consistent, and that is the sky. Indeed, it is possible to argue that the sky can be utilised as a primary source for other areas of the humanities, not just art history. As Matthew Fox (2004) reconstructed the skies of the first century CE and offered a different perspective on Ovid's (43 BCE–c. 17 CE) *Fasti*, and Arthur Beer (1967) reconstructed the skies of the seventh century to understand the cupola of the Qusayr'Amra, so too sky maps reconstructed for the fourteenth century in Padua, linked with naked eye astronomy, have become one of the primary documents of my research and a language that can be used to help correlate and understand images.

I will illustrate the value of such methodology by focusing attention on the upper register of the fresco scheme of the first floor Salone of the Palazzo della Ragione, or Palace of Reason—the law courts—in Padua, Italy. Scholars from as far back as the sixteenth century have approached this imagery by correlating them with horoscopic images found in a book published some 200 years after the fresco scheme was first painted. I contend that these particular images are descriptive of the medieval view of the sky and, moreover, that it is possible to consider the images in this medieval building as exemplifying the way the medieval sky was seen and imbued with meaning—as constellation patterns, rather than as disconnected images in a book. This approach, I contend, allows us to connect more closely with a culture that once connected directly with the sky, making the medieval view of the sky vivid to us in ways that our contemporary society may have lost. Indeed, the top register of the painted fresco scheme opens up a wonder-filled case study on the medieval view of the sky.

History

The history of the Palazzo della Ragione is well documented. It was originally begun in 1172 and finished in 1218–19 as three large halls where the judges held court. In 1306–1309, the Commune entrusted Fra Giovanni degli Eremitani (active in Padua 1289–1318) to create one large hall and build a new wooden roof that resembled the keel of an

upturned ship. In order to do this he increased the outer walls in height from 16 to 24 metres and constructed walls that curved in towards the top to reduce the span of the wooden vault (figs. 1, 3) (Cunningham 1995: 51). The Commune then commissioned Giotto di Bondone (c. 1267–1337) to implement a three-tiered cycle of paintings at the top of these newly heightened bare walls of this first-floor Salone (fig. 3).



Figure 1. Exterior Palazzo della Ragione, south face.
Photo: D. Gunzburg.

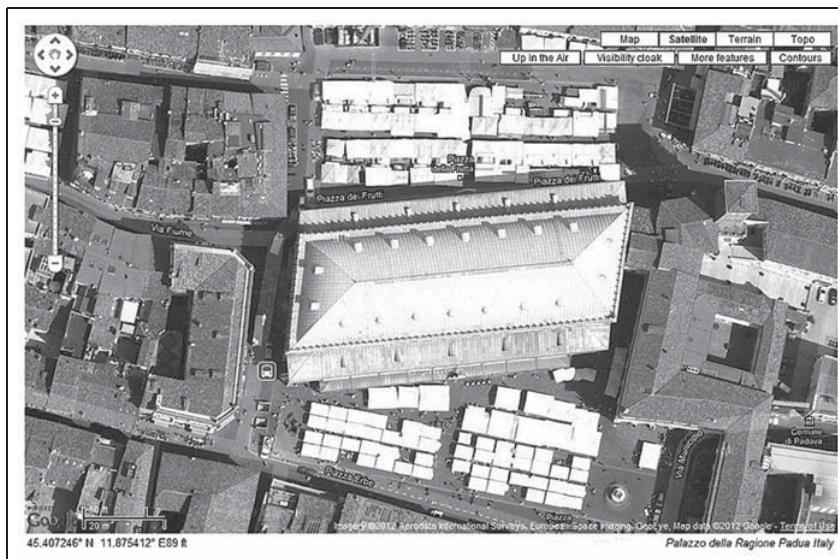


Figure 2. The Palazzo della Ragione from Google Earth.



Figure 3: Interior first floor Salone, Palazzo della Ragione, showing the whaleback wooden vault and the top three registers located at the upper part of the walls of the room right beneath the wooden ceiling. Photo: D. Gunzburg.

The scheme was filled with astronomical and astrological imagery, said to be influenced by Pietro d'Abano (c. 1250–c. 1316), who was teaching medicine, philosophy, and astrology at Padua University at the time. The original meaning of the scheme, contained within a careful arrangement of sky images and symbols, all faithfully maintained over the centuries, has continued to puzzle art historians and modern iconographers, such as Antonio Barzon (1924), Pier Luigi Fantelli and Franca Pellegrini (2000), Dieter Blume (2000), M. Beatrice Rigobello and Francesco Autizi (2008), and Giordana Mariani Canova (2011). With the lack of original commissioning documents for 1306–1309, the primary source that describes the Palazzo della Ragione is that of an eyewitness of the time, Giovanni da Nono (c. 1275–1346), who worked as a judge at the Palazzo della Ragione in the first two decades of the fourteenth century and witnessed the reconstruction. His Paduan chronicle, *Visio Egidij Regis Patavie*, which describes the interior decoration of the Salone, is bare and circumspect (da Nono 1934–39: 20):

Duodecim celestia signa et septem planete cum suis proprietatibus in hac cohopenura, fulgebunt, a Zotho summo pictorum mirifice laborata, et alia sidera aurea cum speculis et alie figurationes similiter fulgebunt interiorius.

The twelve heavenly signs and seven planets with their respective properties/qualities will shine in this complete covering, wonderfully worked by the topmost painter Giotto, and further inside with mirrors will shine other golden constellations and other forms (trans. Gunzburg).

On 2 February 1420, the roof of the Salone was destroyed by fire and much of the scheme was badly damaged. The roof was reconstructed by Bartolomeo Rizzo and the extensive repainting of the astrological

scheme was undertaken by Nicolò Miretto (c. 1375–c. 1450) and Stefano da Ferrara (active fifteenth century) from 1425 to 1440. Michele Savonarola (1385–1468), in his *Libellus*, dated 1446, noted that the artists who repainted the Salone frescoes followed the original iconographical program (Savonarola 1902 [1446]: 44, 47–48). On 17 August 1756, a hurricane tore off the vault and once more, in 1759, it was reconstructed. This time Francesco Zannoni (active eighteenth century) repainted the frescos in the period 1762–70, matching the previous scheme but omitting the stars painted on the ceiling (Fantelli and Pellegrini 2000: 16). This known history recognises that, although the scheme has suffered impairment since its original construction, these images are still with us today, unlike so many frescoes in such buildings of the medieval period which have disintegrated, been broken up, smashed apart, sold off, or destroyed. Eva Frojmovič (1996: 24), who focused her paper on the lowest register painted by Guisto da Menabuoi (c. 1320–1391), has noted how the Commune kept commissioning a repainting of the same themes, rather than painting something new. One can suggest that this was due to the importance of the individual images and their meanings for the medieval viewer, and thus there was the desire to have them faithfully maintained. Therefore, although the scheme can really only be approached through what Guido Giglioni (2008: 94) terms ‘a series of interpretative refractions’, with the images apparently being reproduced through the different levels of restoration it is still possible to explore some of the original thinking behind the scheme.

The Fresco Scheme and the People Who Brought It into Manifestation

The Palazzo della Ragione is a trapezium in shape and specifically a parallelogram where opposite sides of the figure are parallel (fig. 2). The fresco scheme on the first floor Salone is located on the upper part of the walls of the room right beneath its wooden ceiling and the 319 compartments form a painted arrangement on three horizontal registers and along all four walls (fig. 3). These are the earlier registers of frescoes, as distinct from the register visible beneath this that was painted at a later stage by Giusto de’ Menabuoi and with which I will not be dealing. Each scene is created either within a square, within a Romanesque arch, within a trefoil-cusped arch, or, as with some saints, within doorways with square lintels, and the background of each depiction is blue (fig. 4). Each column is visually articulated by fictive pilasters with Corinthian capitals, giving a three-dimensional appearance. These pilasters, painted to look like terracotta, white, and green marble, mediate between the represented scenes vertically. The terracotta frieze of acanthus leaves

carries horizontally across the registers but does not run underneath the signs of the zodiac, nor under the scenes that appear to represent the months. This *trompe l'oeil* effect serves both to separate one scene from another and to integrate the scheme into a decorative whole.

As can be seen in figure 4, the horizontal registers are also divided into columns so that scenes assemble one upon another. The south wall contains 43 columns and the north wall 44. This may simply be an adjustment by the painter to fit in the required number of images. There are 20 circular windows set at irregular distances between the top and middle registers. The top register of horizontal scenes running around all four walls closest to the ceiling appears to show stars and constellations, amongst other images; the middle and lower registers show a combination of the Labours of the Months, signs of the zodiac, the seven major pagan deities, Luna, Mercury, Venus, Sol, Mars, Jupiter, and Saturn, along with various apostle figures whose painted panels cover both the middle and lower registers. As noted earlier, the Salone appears to be the product of at least three minds: Fra Giovanni degli Eremitani, Pietro d'Abano, and Giotto di Bondone.

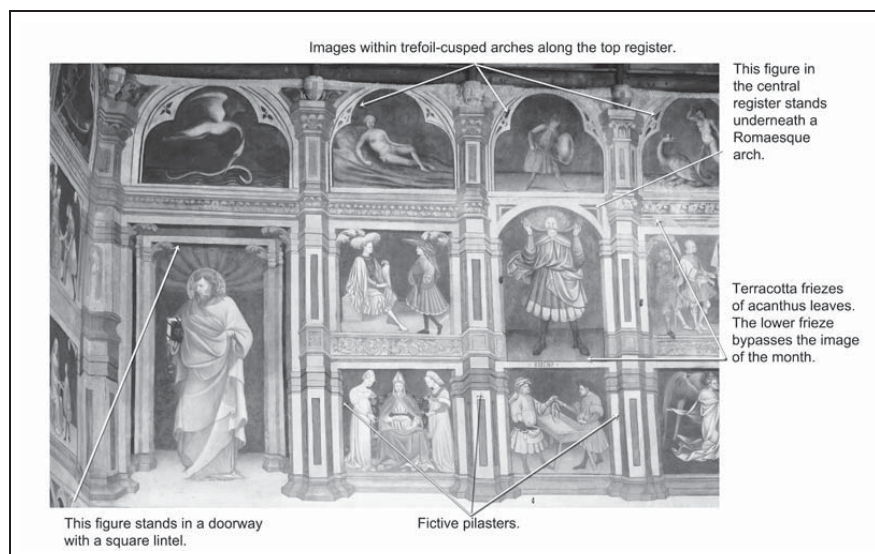


Figure 4. Images from the earlier top three registers along the south wall.
Photo: D. Gunzburg.

Fra Giovanni degli Eremitani—the Architect

Fra Giovanni served as an engineer/architect/town planner and builder of fortifications and roads, bridges, and hydraulic reclamation for the order of the Eremitani (St Augustine). Although he was acknowledged as one of the major innovators of architectural culture and urban

planning in Padua at the turn of the thirteenth and fourteenth centuries, and highly praised by his contemporaries in the mendicant orders as a monk with an exceptional wealth of technical knowledge, little is known of his background.

The first identified document related to Fra Giovanni cites him as a witness to the reading of a will in Padua in 1289, in which he is described as a distinguished engineer (Becchis 2001). In 1295, the town statutes of Padua, the *Codice statuario dei Notai*, state that Fra Giovanni and fellow engineer Leonardo Bocaleca were entrusted with building fortifications at Pizzone, in the southeast of the province of Padua, and a defense tower and a bridge at Castelbaldo, in the southwest of the province of Padua, bordered by the province of Verona, to prevent incursions by the Este and Scala families, both of whom feared the growing supremacy of Padua (Valenzano 2000: 419). In 1301, according to eyewitness Giovanni da Nono (Fabris 1977: 86), Fra Giovanni constructed the *Fondaco delle Biade*, the covered grain market in the vicinity of the *Piazza dell'Erbe* and the *Palazzo della Ragione* in Padua. The *Fondaco delle Biade* has since been demolished (Benton 1995: 20). In 1307, working with the engineer Benvenuto della Cella of the Order of Friars Minor (Franciscans) as superintendent of works (Bourdieu 1991: 16, 47 n. 28), Fra Giovanni began work on the roof and the two-storied exterior galleries of the *Palazzo della Ragione* of Padua. The uniqueness of the shape of the whaleback wooden barrel vault ceiling in Italian civil architecture has provoked historiographical controversy as to where the idea originated; a clear answer remains elusive. All that can be stated with certainty is that this roof shape appears to be the oldest example of a roof of its kind in Italy and that it was created through the genius of a well-travelled man inspired by what he had seen in faraway lands (Dellwing 1969: 152). When the 1420 fire destroyed the roof, Ongarello's 1441 chronicle noted that the keel arch ceiling was rebuilt in its original form (Dellwing 1969: 146 n. 7).¹ Therefore, not only the images were being reproduced but also the architecture of the roof.

In 1310 the *podestà* of Padua gave Fra Giovanni the ambitious project of renovating the *Prato della Valle*, a waterlogged area southwest of the city of Padua. Between 1310 and 1314 he worked on many hydraulic works in Padua and in Treviso where, with the excavations at Brentelle, he created a line of defense for the town in its fight against the Vicentini. After a significant output over a period of 30 years, the absence of documents after 1318 suggests that Fra Giovanni degli Eremitani died about this time (Dellwing 1969: 153).

1. Ongarello's chronicle is held in the *Biblioteca Civica di Padova* 1121,1.

Pietro d'Abano—the Astrological Advisor

Pietro d'Abano, or Peter of Padua as he was also known, was one of the most influential men of learning during the last years of the thirteenth and the early years of the fourteenth century, writing on medicine, philosophy, and astrology. His career incorporated teaching positions at the *studium generale* of Paris and later at Padua University. Nancy Siraisi (1970: 322) regards this as 'a link between the dialectical and philosophical achievement of Paris in the thirteenth century and the burgeoning scientific interests of fourteenth-century Padua'. A. Favaro (1880: 7) named d'Abano as the first professor definitely known to have taught astrology at Padua. In his will d'Abano described himself as 'artis medicine philosophie et astrologie professor'.² D'Abano's reputation as a respected authority on medicine and natural science extended well beyond Padua and continued into the sixteenth century (Siraisi 1970: 322). Michele Savonarola declared he was regarded as a second Aristotle and called 'the great Lombard' (Thorndike 1923–58: 887). Three of his books, all dated to 1310, *The Conciliator*, *The Lucidator*, and *De motu octave spere*, contain his astrological writings. Many of these works are extant, yet only a few parts of them have been translated into English. Federici Vescovini (1987: 38, 39), drawing on the work of Bruno Nardi, concludes that d'Abano should be recognized as an advocate of 'the independence of secular medical, philosophical, and astronomical thinking from theological interference'. Vescovini (1987: 38) argues that d'Abano combined 'Aristotelian philosophy and other doctrinal, medical and astronomical traditions' derived from Byzantine and Islamic scholars, 'separated it [astrology] from demonic magic, and reinstated it between astronomy and mathematics whence certain philosophers and theologians had removed it'.

In 1293 whilst he was teaching at the University of Paris, d'Abano collected and translated into Latin a number of works by the Jewish-Spanish astrologer and polymath Abraham Ibn Ezra (1089–1164). As a result, Ibn Ezra's ideas about astrology gained wide currency in the Latin West (Thorndike 1944: 293–94). Among his works were *The Beginning of Wisdom* (1148), a basic textbook of astrology, *The Book of Reasons*, a commentary and additional material for *The Beginning of Wisdom*, and *The Book of Nativities and Revolutions*, all three of which created an integrated textbook of basic astrological doctrine. These remained popular and influential until the Renaissance.

2. 'Master professor of medicine, philosophy and astrology'. The will is printed in *Atti della R. Accademia dei Lincei*, Series 3, *Memorie delle Classi di Scienze Morali, Storiche, Filologiche*, vol. II (1877–78): 548–50 and cited in Favaro 1880: 8 and Siraisi 1970: 322.

Giotto di Bondone—the Painter

Documents and sources describe Giotto di Bondone as enthusiastic and diligent in his desire to build a career, a widely travelled young man whose sound business skills allowed him to participate in artistic projects all over Italy (Derbes and Sandona 2004: 6). By c. 1313 he had been noticed by chronicler Riccobaldo Ferrarese (c. 1246–died after 1314) (Murray 1953: 59-60):

Zottus pictor eximius, Florentinus, agnoscitur qualis in arte fuerit, testantur opera facta per eum in Ecclesiis Minorum Assisii, Arimini, Padue, ac per ea que pinxit Palatio Comitum (deve dire Communis) Padue et in Ecclesia Arena Padue.

Giotto is an excellent Florentine painter. The quality of his art is attested in his works in the Franciscan churches at Assisi, Rimini, Padua, and in those works that he painted in the Palace of Judgements (that is to say of the Commune) of Padua and in the Arena church at Padua (quoted in Murray 1953: 59-60, trans. Gunzburg).

Francesco da Barberino (1264–1348), in his *Documenti D'Amore* c. 1308–12, praised Giotto's *Envy* in the Arena Chapel (Stubblebine 1969: 109):

Inimica: inimicatur enim patientibus eam unde Invidiosus invidia comburitur intus et extra hanc padue in arena optime pinsit Giottus.

Animosity: it suffers this, indeed, with endurance, as where Envy is consumed with envy inside and out, this Giotto painted excellently in the Arena at Padua (trans. Gunzburg).

In 1315, Dante (c. 1265–1321) in his *Purgatorio* XI, 94-96, cited Giotto's having eclipsed the fame of Cimabue as an example of the transience of temporal fame (Alighieri 1995: 266):

Credette Cimabue ne la pittura
tener lo campo, e ora ha Giotto il grido,
sì che la fama di colui è scura.

Cimabue believed that in painting he led the field,
and now it is Giotto's turn,
So the fame of the former is darkened (trans. Gunzburg).

When he painted the frescoes in the Arena Chapel, Giotto was not yet 40, yet his status stood on secure foundations. As Anne Derbes and Mark Sandona (2004: 2) note, 'The startling freshness of his observations, the economy and empathy of his narratives, the profound dignity and humanity of his figures all set Giotto apart from his contemporaries'.

Although da Nono does not mention Pietro d'Abano, Jean-Michel Massing (1987: 171) suggests that 'it is not to be ruled out that' he was

the man who advised Giotto, or his commissioner, Enrico Scrovegni, on the representation of the comet in 'The Adoration of the Magi' scene in the Arena Chapel. Yet Olson and Pasachoff (2002: 1564) argue that d'Abano did not return to Padua from Paris until 1306 and thus could not have advised Giotto on the comet. Furthermore, there is the suggestion that Giotto himself had observed Halley's comet of 1301, noted it in his sketchbook, and incorporated it when he frescoed the Arena Chapel between 1303 and 1305, thus becoming the first painter to represent the Star of Bethlehem as a comet in painting (Olson and Pasachoff 2002: 1564). Giotto was a great observer of natural phenomena and, as Olson and Pasachoff (2002: 1567) maintain,

[D]espite a literary tradition and contemporary trends, Giotto could not have painted his unprecedentedly vivid comet without experiencing first-hand a spectacular apparition. No written word or visual prototype can explain its revolutionary nature or approach its vivacity, not even the words of contemporary Florentine historian Giovanni Villani, who witnessed the same apparition...*'con grandi raggi di fumo dietro'*.

It is plausible, however, that when he went on to be employed by the Commune to work on the cycle of paintings in the first floor Salone of the Palazzo della Ragione, given the amount of sky phenomena included in the frescoes, he would have been advised on the nature of this material and that advice would, in all likelihood, have come from Pietro d'Abano; he would also have brought his own innovative techniques and thinking to the scheme, as he did with the comet and The Star of Bethlehem. There is another possible connecting link between the two men. D'Abano completed his *Expositio problematum Aristotelis* in Padua in 1310. Nancy Siraisi (1970: 321) has identified the *Expositio* as conceivably being the principal work in this genre and of this period that sought to integrate Greek *problemata* literature with the natural scientific knowledge that was understood by medieval scholars in the West at this time. The question d'Abano was answering in Book xxxvi, 1. §3 was 'Why do (men) make images of the face?' (Thomann 1991: 240). J. Thomann (1991: 240-41) points out that d'Abano offered a theory of visual art as his commentary on the problem and cited Giotto, and Giotto alone, as his example, whereas an anonymous scholar of the same period approached the same problem in an entirely different way and with no reference to visual theory. Thomann thus proposes that d'Abano's choice of subject matter—painting—and painter—Giotto—may have implied a personal connection.

It was with the coming together of these three minds of Giotto, d'Abano, and Fra Giovanni degli Eremitani, under the auspices of the Commune in this Golden Age of Padua, that the Salone came into fruition.

The 'Astrolabium Planum'

When writing about the scheme, scholars have recognized this connection between Giotto and Pietro d'Abano. To date no commissioning documents from c. 1309 between the Commune and any of the three men involved regarding the original scheme have come to light, thus no further underlying information has been able to contribute to an understanding of the frescoes.

Additionally, as noted earlier, research into the scholarship revealed that chroniclers and writers who had witnessed the Salone in their time—da Nono and Michele Savonarola—wrote of how the scheme was informed by the astrological ideas of Pietro d'Abano, yet neither of these writers attempted to decipher the scheme. One could argue that this may have been because it was so culturally familiar that they did not feel the need to describe it. From the sixteenth century onwards, however, by far the major evidence upon which the arguments of scholars rested, from Bernardino Scardeone's (1478–1574) in his book *Historiae de urbis Patavii antiquitate* (1560) to the work of Rigobello and Autizi (2008) and to a certain extent the work of Giordana Mariani Canova (1998, 2011), was a work by d'Abano called the *Astrolabium Planum*, in which d'Abano was said to have depicted astrological images. Because literature from the Quattrocento noted that the Salone images were informed by the astrological knowledge of Pietro d'Abano, scholars sought to find a correlation between his text and the Salone images. One of the difficulties they encountered was that d'Abano's work was apparently no longer extant. As a result, scholars turned to a work that was said to be based on that of d'Abano and was readily available, namely, Johannes Engel's *Astrolabium Planum*, published by Erhardt Ratdolt in Augsburg in 1488, in order to derive meaning for the images in the Salone. The difficulty with this intertextual methodology—the shaping of a text's meanings by other texts—is that the actual nature of what an *Astrolabium Planum* is has not been questioned. The full title of the *Astrolabium Planum* by Johannes Engel is as follows:

Astrolabium planum in tabulis Ascendens continens qualibet hora atque minuto. Equationes domorum celi. Moram nati in utero matris cum quodam tractatu nativitatum utili ac ornato. Necnon horas inequales pro quolibet climate mundi.

Plane astrolabe in Tables (or a list) containing the Ascendant in Each Hour and Minute; the Calculated Positions for the Houses of Heaven; the Length of Time of the Native/Unborn Child in the Mother's Womb along with a Certain Useful and Splendid Treatise on Nativities; and also the unequal hours for Each Clime of the World (trans. Hand).

So what is an 'Astrolabium Planum' and how might it be related to the Salone? An Astrolabium Planum is a flat astrolabe, a set of tables created by using an astrolabe (Greek: astrolabes, 'star-taker'). This distinguishes it from a real astrolabe which contains layers of rotating instrumentation, also known as a planispheric astrolabe since it projects the celestial sphere onto the plane of the equator. The astrolabe was considered to be the precision tool of the age, the new high-tech computer, a mathematical *tour de force* that 'placed an image of the heavens in human hands' (Evans 1998: 157). As a two-dimensional version of a celestial globe, the astrolabe was a working model of the heavens, enabling medieval astronomers to calculate the positions of the sun and prominent stars with respect to both the horizon and the meridian, indicating how the sky looked at a specific place at a given time. The front of a European astrolabe is made up of a mater divided into 24 hours, latitude plates (its terrestrial features), a rete that contains the zodiac belt and the fixed stars (its heavenly features), and a ruler. The rete and the ruler move so that risings and settings of planets and stars can be easily ascertained. By using the sighting device on the back of the instrument, the altitude of the sun or a given star can be determined. One then either sets the mark for the sun on the ecliptic, or the selected star-pointer on the rete over the appropriate altitude mark on the plate (King 2011: I.146). Its most important use was for time-finding and thus time-telling, for day and also night, and it was an essential tool for constructing horoscopes. For the astrolabe, a time-finder was used to construct horoscopes, a time-marker (Ackerman 2005: 73). The user can see at a glance the instantaneous configuration of the ecliptic relative to the local horizon and meridian by which astrological houses are defined.

An *Astrolabium Planum* then laid out this information in tabular format for ease of access. It is fair to assume that Pietro d'Abano, as a professor at the University of Padua, would have been familiar with and would have used astrolabes to construct horoscopes and thus created a set of tables—the *Astrolabium Planum*—for his own use. The astrolabe is the instrument; the *Astrolabium Planum* is the set of tables created from the instrument.

Johannes Engel's *Astrolabium Planum* consists of four parts. Part 1—'the Calculated Positions for the Houses of Heaven'—is a table of houses. A table of houses allows an astrologer mathematically to construct part of a horoscope. Part 2—'the Ascendant in Each Hour and Minute'—contains images. In this part of the book Engel connected each ascending degree with an image that denoted the nature and quality of a person. Once a horoscope was cast, this was one way of considering a person's profession. For example, figure 5 is the image drawn for seven degrees

of Scorpio as it rises in the east. The image that was associated with this degree was described as: 'A man sits with purse in his right hand and a golden bowl in his left hand. This man will be a rich merchant' and was placed in the centre of the square chart. Part 3—*Moram nati in utero matris*, 'the Length of Time of the Native/Unborn Child in the Mother's Womb along with a Certain Useful and Splendid Treatise on Nativities'—is devoted to finding the best time for conceiving a child so that a child of the required sex was born at the proper time. 'Moram' in the title of the document is the accusative of the word 'mora' which means a span of time or delay and is the word regularly used for length of the gestational period found routinely in connection with the Trutine of Hermes or *Trutina Hermetis*, attributed to Hermes Trismegistus, and which forms the 51st aphorism of Ptolemy's *Centiloquium* (Ptolemy 1969 [1917]: 229-30). Part 4—'and also the unequal hours for Each Clime of the World'—includes a table defining the length of an hour depending on the season and latitude. In the medieval world not all hours were equal.

Since part 2 of Engel's *Astrolabium Planum* contained images connected with each individual degree of the zodiac, there was a natural disposition for scholars to try to correlate these images with the images in the Salone as follows: the methodology of these scholars was to look at the images surrounding each zodiac sign, for example Scorpio (fig. 6) and then seek to correlate those images with any of the 30 images for that sign in part 2 of Engel's *Astrolabium Planum* (fig. 5).

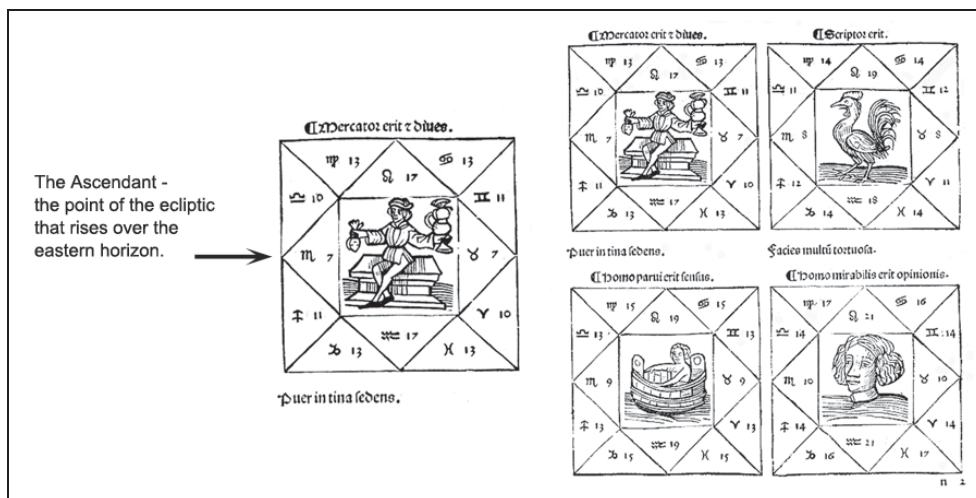


Figure 5. Four of thirty different images associated with the degrees of the zodiac that are rising whilst the Sun is in the sign of Scorpio. From *Astrolabium Planum* by Johannes Engel. BSB-Ink E-63 - GW 1900. Augsburg 1488 'Vigesimoseptimo kalendas Nouembris' 4 Inc.ca. 555. Image: Bayerische Staatsbibliothek.



Figure 6. North wall, Salone, Palazzo della Ragione.
The sign of Scorpio is outlined in black. Photo: D. Gunzburg.

There are multiple difficulties with this approach. If the images on the walls of the Salone were to be a direct correlation with each of the images of the *Astrolabium Planum*, then there would be 360 images in the top three registers of the Salone. However, there are only 319 images. Furthermore, the images in part 2 of the *Astrolabium Planum* relate to the calculation of a single horoscope—a particular moment, a date, and a time of day—and thus scholars were in effect suggesting that the Salone images were representative of precise moments in time. When the intention by artists and commissioners was to create in a fresco an image that *did* depict a precise moment in time, then we have examples of a number of extant/surviving horoscopic ceilings: the Old Sacristy of San Lorenzo, whose fresco represents a horoscope dated to 6 July 1439 at about 12 noon (Beck 1989); the ceiling depicting a sky map in the Villa Farnese at Caprarola (Partridge 1995); the decoration of the vault of the Camera dello Zodiaco of Federico II Gonzaga (Lippincott and Signorini 1991); Giovanni Antonio Vanosino da Varese's ceiling (Hess 1967); and the horoscope tile in the Sala Bologna, Vatican Palace, 1575 (Urban 2013). Scholars have recreated these ceilings astronomically and astrologically and understand that they reflect the skies at particular times and dates. This does not, however, seem to be how the images of the Salone are being deployed. Indeed, this methodology has not revealed significant correlations and many of the images of the Salone still remain undeciphered. Furthermore, the actual document on which the Salone frescoes are meant to be based *does* exist but appears to have been unknown to earlier scholars, thus they used Engel, since he cited d'Abano's 'lost' work. Pietro d'Abano's *Astrolabium Planum* is held in the *Bayerische Staatsbibliothek in Munich* (CLM22048) and is catalogued as:

De signis celestibus eorumque significatione et potestate, cum multis tabulis astronomicis.

On the heavenly signs or images which have significance and potential, with many astronomical tables (trans. Gunzburg).

It also appears to contain four parts, including tables, but it does not contain the images found in the later copies (such as in Engel's version some 150 years later), only written descriptions of them. Federici Vescovini (1987: 36) translated these written descriptions in the 1980s but she appears to have only focused on the third of the four sections of the complete document.

The opening text of the first section is headed '*Canon Tabule de moris infantum*' ('Rule of the table of the period of infants'). Here once again is a section of the document connected with the length of the gestational period connected with the Trutine of Hermes. The manuscript also contains completed and blank charts, indicating that perhaps this is the workbook of a working, consulting astrologer. What is more, one can argue from the palaeography that this text is a copy made to be read and worked with only by the person who wrote or copied it. Despite the weak correlations, and ignoring the exact date issues (described earlier) and that the images did not exist in Pietro d'Abano's *Astrolabium Planum*, with no other solution to understanding Giotto's images, scholars have persisted with employing Engel's *Astrolabium Planum* as the key to the images of the Salone. This flawed assessment has become a standard discourse, reproduced as recently as 2008 (Rigobello and Autizi) and to a certain extent in 2011 (Mariani Canova 2011: 125-29).

Putting this historical argument to one side, any questions asked about the Salone must include questions concerning the whole of d'Abano's text, how d'Abano would have used it, and how it might have contributed to the fresco images of the Salone. Furthermore, by understanding the astrolabe, additional questions can be asked of the images of the Salone. Given the nature and power of the astrolabe as a calendrical, time-keeping device with an ability to recreate a skymap for any date, it seems a more valid approach to consider that the images of the fresco may actually have been informed by the astrolabe, rather than looking at the astrological part of d'Abano's text, which is devoted to an individual's unique horoscope. For the Palazzo della Ragione was a public place, not a private chapel commissioned for one individual. The way that a fresco scheme can be informed by the astrolabe, with its rete and latitude plate, is by reproducing the sky on the walls for any given month as shown by the astrolabe.

A Different Perspective

Having reviewed this past work on the scheme, I decided to take a fresh approach starting from the work of Giovanni da Nono and his simple statement in his *Visio* that the Salone images contained ‘the twelve heavenly signs and seven planets with their respective qualities’ (da Nono 1934–39). (These relate to the twelve horoscope signs still used in astrology today.) The twelve zodiac signs are clearly identifiable in the middle register of the walls (fig. 6). Beginning along the south wall in calendar order, it can be seen that the scheme moves in a clockwise or sunwise direction around the Salone.

Using the sky as a primary document, with the help of astronomical software,³ I recreated the night sky for Padua in 1309 for each of the months. The actual position of the sun amongst the stars can be determined by observing (i) the stars rising or setting before the sun rises, (ii) the stars rising or setting after the sun sets, or (iii) the stars culminating at midnight when the sun is on the nadir (Ptolemy 1998: 407–13). Accordingly, I constructed the night sky for these three different views for each of the twelve months at the moment when the sun moves into each zodiac sign, and then looked at the sky patterns. This provided a set of constellation images that could then be compared with the images along the top register of the Salone situated near each appropriate zodiac sign in the middle register. The iconography of the constellations is well established from Aratus (c. 315–240 BCE) in his *Phaenomena* onwards and described in detail by Ptolemy (c. 90–168) in his *Almagest*, articulating the exact positions of the parts that form the images of the constellations.

3. Starlight is a virtuoso astronomical software program created by Bernadette Brady with mathematician Sarah Ashton. It contains a planetarium especially designed for astrologers so they can learn about, find, and name the stars in the sky through images, myths, and constellations. Based on the Yale Bright Star Catalogue, it includes all of Ptolemy’s 1100 stars, as well as substantial additions from Richard Hinckley Allen’s masterwork on star names, every named star (over 350), as well as every star visible to the naked eye – over 9000 stars in all. It also takes into account precession, which is defined as follows: the ecliptic crosses the celestial equator at two points. The sun reaches these two crossing points at the time of the equinoxes. Precession, also known as the ‘Precession of the Equinoxes’, is the movement of these crossing points along the equator at the rate of 50.25 seconds of longitudinal arc per year. Thus the first point of the tropical zodiac, Aries, which is defined by the equinox, seems to move in a retrograde fashion against the backdrop of the fixed star constellations.

Sky Maps on the Salone Walls: The Zodiac Sign of Aries

My own examination of the Salone walls agrees with previous scholars that the section of the scheme describing the month of March along the South Wall for when the sun enters the zodiac sign of Aries is recognisable by the image of the Ram of Aries (fig. 7). Barzon (1924), Fantelli and Pellegrini (2000), and Rigobello and Autizi (2008) have correlated the images along the top register above the saint, using Barzon's numbering system as follows: a heron (1A); a woman of the underworld or a woman of misdeed or wrongdoing (2A), since she is a naked and lying on her back with her legs apart; a warrior (3A); the constellation Hercules (4A); and a woman reading or imprudent love (5A) (table 1).



Figure 7. The section of the scheme depicting the month of March along the south wall for when the sun enters the zodiac sign of Aries (outlined in black). Photo: D. Gunzburg.

Table 1. Comparison of historical argument for the images with the revised meanings for the sky map for the sun moving into the tropical zodiac sign of Aries, Padua, c. 1309.

<i>Barzon number</i>	<i>Historical argument</i>	<i>Revised meanings</i>
1A	A heron	The constellation Cygnus the Swan
2A	A woman of wrongdoing	The constellation Andromeda the Maiden
3A	A warrior	The constellation Perseus the Warrior
4A	The constellation Hercules	The constellation Hercules the Hero
5A	A woman reading/imprudent love	The constellation Cassiopeia the Queen

Using the software to reconstruct the sky for Padua 1309 when the sun ingressed into the zodiac sign of Aries, I looked to see what were the constellations in the night sky after the sun had set, at midnight and predawn. The constellations visible in the predawn sky, which would have been easily calculated by Pietro d'Abano using an astrolabe and easily seen on a clear night in Padua (fig. 8), revealed the following: the constellation Perseus the Warrior, Andromeda's suitor, young, masculine, and full of male energy (correlating with the image in the top register of the Salone at 3A), is clearly visible along the northeast horizon.

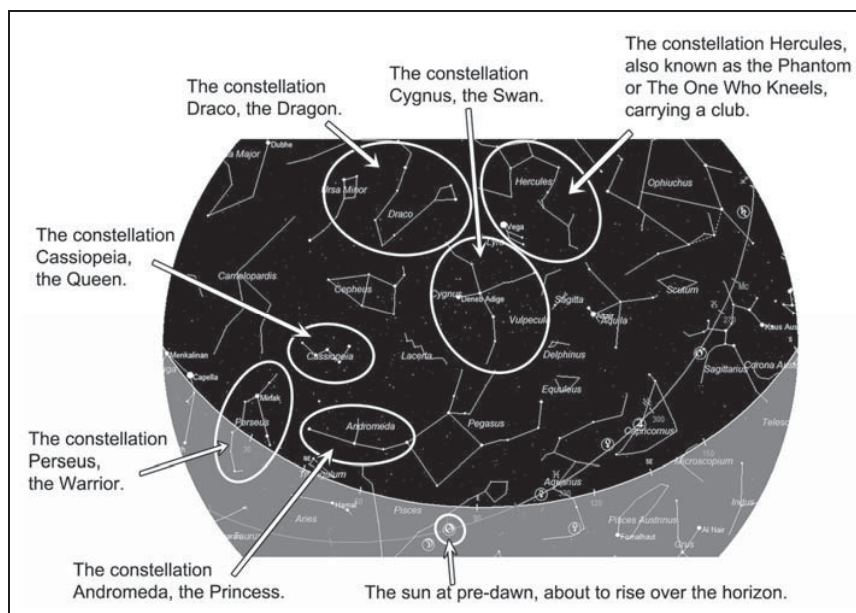


Figure 8. Sky map for pre-dawn Aries Ingress 13 March 1309 (Old Style calendar), LMT, Padua, Italy, showing the constellations that are visible in the night sky (black). Constellations below the horizon (grey) have not yet risen and hence are not visible.

Next to him in the sky is the constellation Andromeda, the Princess, the young, fertile virgin, the marriageable daughter waiting for suitors in a position of willing receptiveness (correlating with the image in the top register of the Salone at 2A). Above her is the distinctive 'W' of Cassiopeia the Queen, a noble woman (correlating with the image in the top register of the Salone at 5A). Next to her is Cygnus the Swan, situated at the point above the horizon where the sun would rise due east (correlating with the image in the top register of the Salone at 1A). On the zenith, the point directly above one's head, is Hercules, also known as the Phantom or The One who Kneels (correlating with the image in the top register of the Salone at 4A).

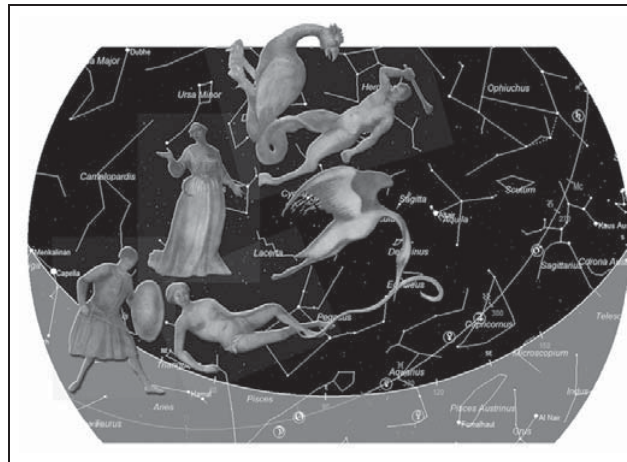


Figure 9. Sky map for pre-dawn Aries Ingress 13 March 1309 (Old Style calendar), LMT, Padua, Italy, showing the artist's impression of the sky and their correct orientation of Perseus the Hero (3A), Cassiopeia the Queen (5A), Andromeda the Princess (2A), Hercules and Draco (4A), and Cygnus the Swan (1A).

In Greek literature Hercules carries a club in his right hand and the double-headed Cerberus in his left hand. In the image at 4A (fig. 7), Hercules holds a club in his raised right arm and stands with his right foot on the tail of a dragon or serpent, representing the constellation Draco the dragon or serpent. Damage has, however, obliterated any object in his left hand. Images from medieval bestiaries show how the serpent/dragon was perceived with wings and legs. The serpent was said to flee from a naked man but attack a clothed man, which may account for why Hercules is depicted in the image at 4A as nearly naked. This methodology of seeing this upper register informed by the astrolabe offers an extremely different interpretation of these images, as summarised in table 1, suggesting that the images reveal what the sky actually looked like as a seasonal marker with this narrative of constellations (fig. 9). Whilst the sequencing of images along the top register of the Salone is not exact, the collection of the five images forming this set are indeed the images of the five constellations for that month seen before the rising sun.

Sky Maps on the Salone Walls: The Zodiac Sign of Gemini

The section of the scheme describing the month of May along the South Wall, when the sun enters the zodiac sign of Gemini, is recognisable by the image of the Twins of Gemini (fig. 10). In the same way as scholars described the images of the top register of Aries, so they also described a man with a crossbow (30A), a man with a stick (31A), the constellation of the Little Horse (32A), and the constellation of The Plough (33A).



Figure 10. The section of the scheme depicting the month of June along the south wall for when the sun enters the zodiac sign of Gemini.

The image of The Twins is clearly identifiable along the middle register on the right hand side. Photo: D. Gunzburg.

Table 2. Comparison of historical argument for the images with the revised meanings for the sky map for the sun moving into the tropical zodiac sign of Gemini, Padua, c. 1309.

<i>Barzon number</i>	<i>Historical argument</i>	<i>Revised meanings</i>
30A	A man with a crossbow	The constellation Sagittarius the Archer
31A	A man with a stick	The constellation Perseus the Warrior
32A	The constellation of the Little Horse	The constellations of Pegasus, and Equuleus the Little Horse
33A	The constellation of The Plough	The constellations of the Great and Little Bears, Ursa Major and Ursa Minor

'A man with a crossbow'...is possibly the constellation of Sagittarius the Archer. The image is depicted as a swarthy man with short dark hair and a beard holding a crossbow. He wears a brown sack hat on his head and is dressed in a square-necked, waisted tunic that falls just below his knees, with long, close-fitting sleeves and cream hose. Whilst this may differ from the recognised wild satyr constellation of half man, half beast, said to have been derived from the Sumerian Enkidu created to destroy Gilgamesh (Jobes 1964: 236-37), the constellational emphasis was always on the bow and the destruction that the archer could cause through using his sharp eyesight in conjunction with the bow, allowing him to kill a man from afar, rather than through hand-to-hand combat with a sword. Aratus described the constellation Sagittarius the Archer simply as 'Bow and Archer' (2010: 13). In considering the sky at sunset, midnight, and predawn for Padua at the Gemini Ingress (when the sun moves into the sign of Gemini), at predawn—exactly the same time of the day as the previous example—the constellation of Sagittarius (fig. 11) and the narrative he depicts (fig. 12) is setting in the west.

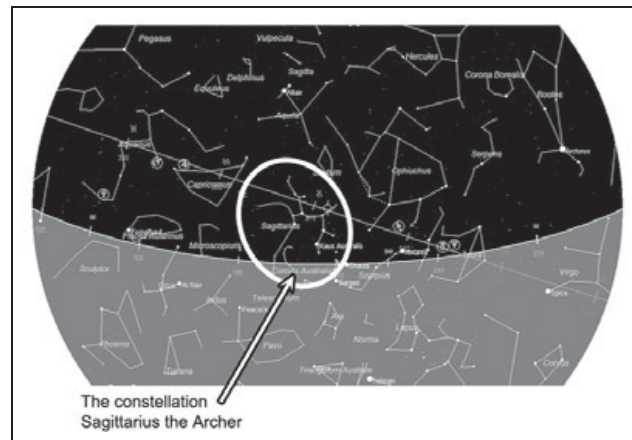


Figure 11. Sky map for pre-dawn Gemini Ingress 13 May 1309 (Old Style calendar), LMT, Padua, Italy, showing the constellation Sagittarius the Archer setting on the horizon in the west.



Figure 12. Sky map for pre-dawn Gemini Ingress 13 May 1309 (Old Style calendar), LMT, Padua, Italy, showing the artist's impression of the sky of the constellation Sagittarius the Archer setting on the horizon in the west.

In the east, before the sun rises, there are three images from the top register of the Salone (fig. 10) that correlate with the three other constellations that are visible in the sky at this latitude. 'A man with a stick' is possibly the constellation Perseus the Warrior. The image at 31A depicts a swarthy man with a baton held in his right arm in readiness to take action. He is painted above the arch of the window as if keeping watch on a battlement or bridge, so we cannot see his feet. The iconography of the image is in keeping with the constellation of Perseus, the young warrior, the champion, holding a weapon in readiness. The image at 31A is contiguous with the image of the two horses in the Salone at 32A, and the two horses of Pegasus and Equuleus the Little Horse lie near Perseus in the sky. Completing this run of sky images is the image of a wagon

covered with a red cloth with four large cartwheels. To the left can be seen the back two wheels of a second wagon. This image is what scholars call 'Plaustrum', The Plough, also known as The Wain or Wagon, and they are the Great and Little Bears, Ursa Major and Ursa Minor. These were called Wagons or Wains by Aratus (2010: 1; Allen 1963: 420, 426):

Two Bears surround this pole
(Which are at times called Wagons since they roll
Like wagon-wheels).

As northern constellations situated around the North Pole, the Bears never set. In the sky map (fig. 13) all four constellations are clearly visible in the pre-dawn light at this Gemini Ingress, depicted in the Salone as a vivid sky alive with imagery (fig. 14). Again the sequencing is not exact but the collection of the four images forming this set are indeed the images of the four constellations for that month seen before the morning light—one setting in the west and three rising in the east, as summarised in table 2.

One might ask why the constellation Sagittarius was chosen and not, for example, Pisces, as another major constellation on the sun's ecliptic. The answer may be that Pisces is an extremely faint and hard to see constellation, whereas Sagittarius is bright and striking. The other issue to consider is that not all astrolabes have all the constellations, and we do not have the instrument used by d'Abano. Although these are just two months of a whole twelve-month cycle represented in the Salone, nevertheless, it appears that the top register of this three-tiered scheme is reflective of a twelve-month cycle of constellational images.⁴

The cosmological implications of this research are far-reaching. The scheme was painted at a time when Scholastic thought—the joining of faith to reason—was flourishing in the Latin West (Pieper 2001) and, like other visual schemes of the time that included astrological imagery, such as the Fontana Maggiore, a fountain located in the centre of Perugia in Umbria in central Italy, built in 1278 and sculpted by Nicola and Giovanni Pisano (Gunzburg 2013), indicated that astrology was embraced and understood as the physics of the day, the way the world worked. Thomas Aquinas (c. 1225–1274) followed Albertus Magnus (1193–1280) when he crystallised the orthodox view of astrology and Christianity (Aquinas, *SCG* 3.85, 89, 91, 92). Astrology, a belief in an ensouled sky, provided information and a rationale for medicine and meteorology. The spirit/soul, however, as Aquinas qualified, was 'controlled immediately by God' (Aquinas, *SCG* 3.91.2).

4. My continuing research is also examining the images and their connections along all three registers.

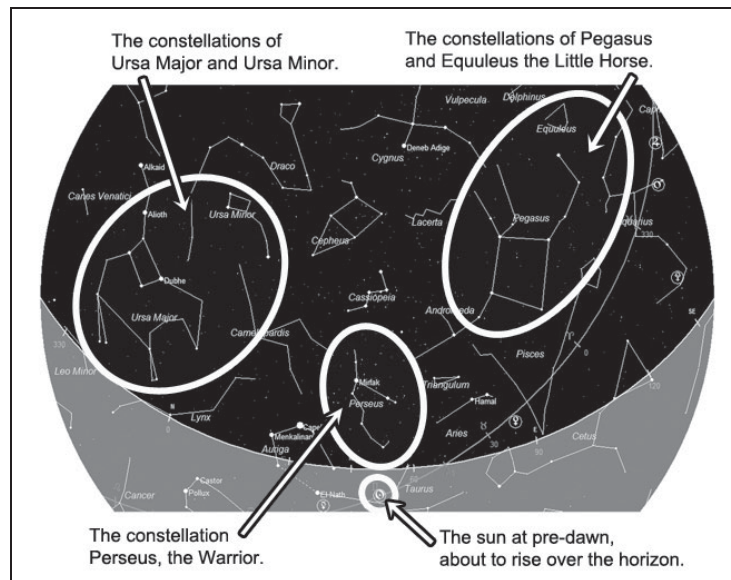


Figure 13. Sky map for pre-dawn Gemini Ingress 13 May 1309 (Old Style calendar), LMT, Padua, Italy, showing the constellations that are visible in the night sky (black). Constellations below the horizon (grey) have not yet risen and hence are not visible.

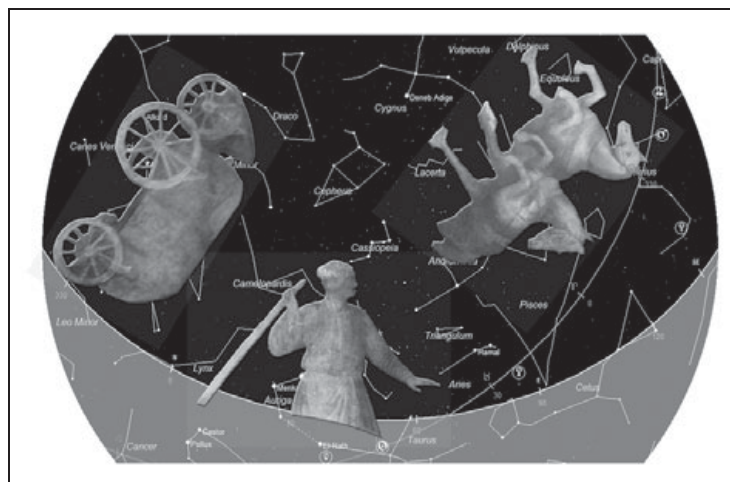


Figure 14. Sky map for pre-dawn Gemini Ingress 13 May 1309 (Old Style calendar), LMT, Padua, Italy, showing the artist's impression of the sky of the constellations Ursa Major and Ursa Minor, Perseus the Warrior, and the constellations of Pegasus and Equuleus the Little Horse.

Furthermore, in terms of constellation iconography, since Aratus the sky images of the 48 named constellations have remained consistent. Richard Hinckley Allen (1963: 12) noted:

From Ptolemy's time, with the exception of the *Alfonsine Tables*, no advance was made in astronomical science for 1300 years, and the *Syntaxis* continued to be the standard of the world's astronomy, a sort of astronomical Bible from which nothing was taken, and to which nothing material in principal was added.

It was not until the exploration of the New World at the beginning of the sixteenth century that the southern hemisphere skies were discovered and then formally catalogued a century later by Johann Bayer (1572–1625) (Allen 1963: 13–14). The new images were added, bringing the total number of constellations to 88, but the original 48 were left unaltered. Consequently, the constellation of Cassiopeia today (as argued by Brady in this issue of the *JSRNC*) was also the constellation of Cassiopeia that rose over Padua in the fourteenth century. This change in the sky occurred at the same time as the Platonic cosmology and Aristotelian physics fell from grace under the influence of Copernicus, Kepler, and Galileo (Kuhn 1990 [1957]: 1–2), giving the scholars of the seventeenth century a different worldview from the artists of the thirteenth century.

Conclusion

For at least three centuries, the upper register of the three-tiered fresco scheme of the first floor Salone, with its depiction of heavenly constellations informed by the extensive astrological knowledge of Pietro d'Abano, and the artistic innovation of Giotto, visually reminded the judges who worked in this building of the cosmology in which they lived. By the sixteenth century, however, the scheme's meaning had been lost to the observer who stood in a different cosmology from the first painters and advisors. Scholars from Scardeone (1560) to Mariani Canova (1998, 2011) all acknowledged that there were constellation images contained within this top register, yet they looked for meaning from the *Astrolabium Planum* of Johannes Engel of 1488, rather than turning their eyes to the actual sky. My work has been to reconstruct the skies over Padua in the medieval period using astronomical and astrological software. This approach reveals a night sky that was populated with a constellational iconography that, I argue, was part of an ensouled cosmology reflective of the constellations that dictated the seasons and the cycle of the year as seen over Padua c. 1309.

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