

RESEARCH ARTICLE

# Imagining the Heavens: Adam Elsheimer's *Flight into Egypt* and the Renaissance Night Sky

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Adam Elsheimer's *The Flight into Egypt* (1609) has triggered a longstanding debate among art historians. For the last five decades, Elsheimer's novel naturalistic representation of the night sky in his painting on copper has been linked to Galileo's telescopic observations. To explain the astronomical details of this painting, scholars have contended that Elsheimer observed, before Galileo, the night sky with one of the first telescopes available in Rome. So far, the debate has lacked input from the history of astral science. This article presents a case study that examines the relationship between the visual arts and astronomical knowledge. It offers a contextualized analysis of the technical details of the artwork within the prevailing astronomical knowledge—before the appearance of Galileo's *Sidereus Nuncius*—and frames it within the network of and debates among prominent figures of Galileo's and Elsheimer's time. It proposes a revisionist interpretation of Elsheimer's most famous artwork based on an analysis of the technical and cultural practices of discerning and imagining the night sky around 1600.

**Keywords:** Adam Elsheimer; Galileo Galilei; telescope; Milky Way; early modern astral science; Renaissance

When Adam Elsheimer died on 11 December 1610, aged only 32 years, what was presumably his last painting, a small painting on copper titled *The Flight into Egypt* (**Figure 1**), was in his bedroom in his residence in Rome and the first painting listed on the inventory of his possessions.<sup>1</sup> A week later, Elsheimer's friend Johann Faber (1574–1629), a German doctor and botanist who lived in Rome, communicated Elsheimer's untimely death to the Flemish artist Peter Paul Rubens (1577–1640). The three men had met each other in Rome years earlier and were intimately connected.<sup>2</sup> Elsheimer had been a regular guest in Faber's house, and both were closely acquainted with members of the *Accademia dei Lincei*.<sup>3</sup>

Rubens was shocked by the unexpected news of Elsheimer's early death. Writing from Antwerp, he sent his deepest condolences to Faber and expressed his admiration for Elsheimer's small figures and landscapes. He regretted that no work by Elsheimer was to be found in Flanders and tried to acquire *The Flight into Egypt*, promising that he would employ all his efforts as "a tribute to the dear memory of Signor Adam."<sup>4</sup>

Rubens proved to have had the right instinct. *The Flight into Egypt* would later contribute directly to the "dear memory of Signor Adam." At the quadricentennial of Elsheimer's death, an epitaph was placed on one of the columns in the Basilica of San Lorenzo in Rome where the artist had once been buried. It celebrates Elsheimer as a painter and observer of the starry heavens in 1609.<sup>5</sup> It even attributes to him the use of one of the first telescopes on account of his painting *The Flight into Egypt*. This article disputes this claim.

<sup>1</sup> Andrews, "Inventory," 599.

<sup>2</sup> On the relationship between Rubens and Faber, see Huemer, *Rubens*, 3–27. On Elsheimer and Rubens, see Baumstark, "Weggefährten." See also Klessmann, *Elsheimer*, 21–23.

<sup>3</sup> On Faber and his relationship to the Linceans, see, e.g., Freedberg, *Eye of the Lynx*, 112–16.

<sup>4</sup> Rubens, *Letters*, 53–54.

<sup>5</sup> The last sentence of the epitaph reads: "Nel 1609 dipinse il cielo stellato osservandolo con uno dei primi telescopi."



**Figure 1:** Adam Elsheimer, *The Flight into Egypt*, 1609, oil on copper, 31 × 41 cm. © Alte Pinakothek, München.

### Art and Science at the Crossroads

In 1976, the art historian Anna Ottani Cavina first conjectured that Elsheimer's seemingly naturalistic impression of the night sky is explicable only in the light of Galileo's research into the heavens.<sup>6</sup> According to Cavina, the composition of the Milky Way as an agglomeration of individual stars and the accentuated light and dark blotches present on the face of the full moon, in particular, demonstrate Elsheimer's prompt incorporation of the most advanced scientific observations of his time. In *Sidereus Nuncius*, Galileo indeed wrote about his pioneering observations of the Milky Way through a telescope and stated that "the Galaxy is nothing else than a congeries of innumerable stars distributed in clusters."<sup>7</sup> He was opposed to the Aristotelian notion of the immaculate and pristine nature of the moon and argued that the light and dark patches, also visible to the naked eye, correspond to mountains and valleys on its surface. That Elsheimer's *Flight into Egypt* gives an artistic interpretation and rendering of Galileo's novel astronomical observations is hence a tempting and attractive idea, but it comes with a serious problem. The *Sidereus Nuncius* was published on 13 March 1610, yet the reverse of Elsheimer's image unmistakably states: "Adam Elsheimer fecit Romae 1609."

Since Cavina's conjecture, the debate about the image has revolved around the following question: What astronomical knowledge did Elsheimer depict above the Holy Family as they pause by the waterside? To answer this question, art historians have begun to delve into the history of astronomy but have not fully exploited the vernacular ideas or the interactions between visual culture and astral belief of Elsheimer's time. The following analysis therefore provides a crucial contribution to the history of knowledge by investigating the technical and cultural practices of seeing and discerning the night sky around 1600 and comparing this knowledge tradition with aspects of Elsheimer's painterly practice. This essay shows that the lack of a detailed understanding of these issues has led to an array of erroneous views about his work. It ends by proposing a revisionist account of his most famous painting.

The literature includes a wide array of views on how to interpret Elsheimer's starry heavens. In a letter printed in *The Burlington Magazine*, the Elsheimer expert and biographer Keith Andrews has vehemently denied both Elsheimer's use of a telescope and his awareness of Galileo's research, but his claims have gone

<sup>6</sup> Cavina, "Theme of Landscape."

<sup>7</sup> Galilei, *Sidereus Nuncius*, 62.

mostly unheard.<sup>8</sup> In particular, the idea that Elsheimer's detailed depiction of the Milky Way required either the aided view of a telescope or Galileo's influence has been widely embraced. Oral and written reports of early telescopic observations of the night sky are often believed to be the basis for Elsheimer's picturing of the starry heavens.<sup>9</sup> Recently, the instrument has even been passed into Elsheimer's own hands.<sup>10</sup> Andreas Thielemann has convincingly argued that a telescope may have been available to him in Rome already in the late summer of 1609. From this, he has assumed that the painter himself was able to peek through one of these early instruments.<sup>11</sup> Thielemann's verdict represents the status quo.<sup>12</sup> Others have argued that Elsheimer's night sky contains certain astrological references and symbolic associations that add to the overall religious narrative. This line of interpretation also presumes he took artistic inspiration from novel astronomical discoveries and observations.<sup>13</sup>

What all the accounts asserting or dismissing Elsheimer's scientific diligence and telescopic observations share is that they have failed to ask the most fundamental question underlying the historical issue at hand: How were the heavens perceived without a telescope? What did people see when they looked up at the stars with their naked eyes? From the point of view of the history of astral science, as this essay shows, there is no evidence that Elsheimer made any rendering of the starry sky that necessitated the use of a telescope. His canopy above the Holy Family exemplifies a distinct iconography of the starry heavens that renders them as they were commonly and predominantly perceived in his time, although he was the first—in European art—to depict them in such detail. Placed in its wider historical context, his image proves to be a transformation of the prevailing practices of seeing, discerning, and imagining the starry night sky into a visual medium, not an anticipation of Galileo's telescopic observations.

### Elsheimer's Gaze

Frederico Cesi (1585–1630), the founder of the Academia dei Lincei, was constructing telescopes at the same time as Galileo. According to a later statement by Faber, Cesi had assembled a few telescopes in Rome and distributed them among some of the city's nobles.<sup>14</sup> Cesi must have followed the detailed instructions sent to him in a letter from Giambattista della Porta (1535–1615) dated 28 August 1609:<sup>15</sup>

It is a solid silver tube measuring a palm from *a* to *d*, three inches in diameter, with a convex lens at one end (*a*). There is another tube 4 inches long that fits into the first, with a concave [lens] at the end (*b*), like the first.<sup>16</sup>

On the basis of these sources, Thielemann has argued that Elsheimer had marveled at the heavens through one of these instruments and subsequently painted their image.<sup>17</sup> It is indeed likely that Elsheimer was aware of or had seen a telescope constructed on the basis of this description. But Thielemann and others have failed to take into consideration both the performance of these possible early instruments and the prevailing practices of observation. Lenses available in the shops of spectacle makers at the time had a focal length of 30–50 cm when convex and about 20–30 cm when concave.<sup>18</sup> These focal lengths fit perfectly with the main tube, which measured the length of a palm (about 25 cm), and the ocular tube of about 10 cm that della Porta described in his letter. Such an instrument would have had approximately three-power magnification.<sup>19</sup> What would Elsheimer have seen had he indeed pointed such an instrument towards the Milky Way? The same as he would see today: nothing but a continuous illuminated band. There were no astronomical novelties to be discovered with such an instrument, and there was certainly no "visual jump into the depth of space" that Thielemann envisioned.<sup>20</sup> Galileo himself had forewarned readers of

<sup>8</sup> Andrews, "Elsheimer and Galileo."

<sup>9</sup> Byard, "A New Heaven"; Huemer, *Rubens*, 8; Reeves, *Painting the Heavens*, 19; Olson and Pasachoff, "Moon-Struck."

<sup>10</sup> Damianaki, *Galileo e le arti figurative*, 46–61; Dekiert, "Werk und Wirkung."

<sup>11</sup> Thielemann, "Natur pur?"

<sup>12</sup> See, e.g., Bredekamp, *Galileo's Thinking Hand*, 95–97.

<sup>13</sup> Howard, "Elsheimer's Flight into Egypt"; Kemp, "Science in Culture"; Howard and Longair, "Flight into Egypt."

<sup>14</sup> Faber's report is included in Hernández et al., *Rerum medicarum*, 473. See also Thielemann, "Natur pur?," 144.

<sup>15</sup> Cf. Thielemann, "Natur pur?" On the history of the early telescope, see van Helden, "Invention." On the initial dispersal of it across Europe, see Sluiter, "Telescope."

<sup>16</sup> Gabrieli, *Carteggio*, 114–15. Translation by Galluzzi, *Lynx and Telescope*, 1.

<sup>17</sup> Thielemann, "Himmelsfeuer."

<sup>18</sup> Van Helden, "Invention," 11.

<sup>19</sup> Galileo's first-built instrument had three-power magnification, see Galilei, *Sidereus Nuncius*, 37. It was probably likewise made from lenses available from spectacle makers. See van Helden, "Invention," 11–12. See also van Helden, "Galileo and the Telescope."

<sup>20</sup> Thielemann, "Himmelsfeuer," 154.

his *Sidereus Nunci* that a good instrument with some twenty-power magnification was a prerequisite to replicate what he had observed: “For if it is not an instrument such as that, one will try in vain to see all the things observed in the heavens by us.”<sup>21</sup>

In 1611, when asked by Robert Bellarmine to judge Galileo’s observations, Christoph Clavius and the Jesuits at the Collegio Romano could only conjecture on the true nature of the Milky Way using a state-of-the-art instrument with approximately thirty-power magnification.<sup>22</sup> In 1609, if Elsheimer did use a telescope with some three-power magnification, there would be nothing for him to discover that was not already known and assumed. When viewed with a telescope of this power, the Milky Way does not reveal its starry nature. To understand the inspiration for Elsheimer’s depiction, it is thus necessary to look at his practice as a painter instead.

## Light and Darkness

Adam Elsheimer, the son of a tailor, was born on 18 March 1578 in Frankfurt. He was a pupil of the local artist Philipp Uffenbach (1566–1636). In 1598, he traveled via Munich to Venice, where he stayed for a few months working for or with the painter Hans Rottenhammer (1564–1625). He finally settled in Rome in April 1600, where he remained until his death in December 1610. Elsheimer’s oeuvre, built over the short span of his career as a painter, comprises about fifty small paintings in oil on copper and a few gouaches, drawings, and prints. His early works bear witness to his apprenticeship in the German Renaissance tradition and to the inspiration he drew from the prints of Albrecht Dürer (1471–1528).<sup>23</sup> Most of Elsheimer’s works present religious or mythological scenes in which the agency of light is essential. The light in his paintings always comes from distinct sources and is employed as, to use Keith Andrews’ apt phrase, “an agent which fuses nature and figures into one, defining forms as well as space.”<sup>24</sup> When staged indoors, the scenes are illuminated from artificial sources of light, such as candles, oil lamps, and smoldering fires. Elsheimer showcased his impressive skills in rendering indoor light in his *Jupiter and Mercury in the House of Philemon and Baucis* (ca. 1608–1609).<sup>25</sup> For the painting’s subject, he imagined a scene from Ovid’s *Metamorphoses*, which was one of the few books he owned.<sup>26</sup> In Joachim von Sandrart’s (1606–1688) judgment, the illumination of the image was so compelling that it “became a school and lesson from which one could learn how to paint darkness properly.”<sup>27</sup> Outdoor scenes in Elsheimer’s oeuvre, however, are dominated by natural sources of light like the sun and moon or burning torches and blazing fires. In his *St. Christopher* (ca. 1598–1599), four distinct sources of light pierce a solid darkness. One, partly obscured in the cloudy sky, is the bright full moon—complete with slight variations of light and shadow.<sup>28</sup> This combination and interplay of light and darkness differentiates Elsheimer’s imagination of the legend of Saint Christopher, originating from the *Legenda aurea*, from other depictions of this theme.

The biblical subject Elsheimer chose for his last painting, *The Flight into Egypt*, had a long tradition of being depicted. The event is described in the Gospel of Matthew.<sup>29</sup> Soon after the birth of Jesus and the visit of the Magi, an angel appears to Joseph in a dream and warns of Herod’s intention to slay all newborn children. Joseph does not hesitate to heed the angel’s warning, and “when he arose, he took the young child and his mother by night, and departed into Egypt.”<sup>30</sup> In a scene from a *Biblia pauperum* illuminated in Erfurt around 1340 (**Figure 2**), Joseph is leading a donkey with a bridle as the Holy Family flees to Egypt. He is carrying some of their belongings on a staff swung casually over his shoulder; Mary is seated on the back of the donkey with the infant Jesus wrapped in her coat. This plain depiction already displays most of the common iconographic details associated with this motif.<sup>31</sup> Their exile in Egypt, though, would not last forever. As soon as Herod dies, an angel appears again and tells Joseph to return to the land of Israel. Consequently, the illuminators of the *Biblia pauperum* had Joseph literally turn his donkey around and return to the Holy Land.

<sup>21</sup> Galilei, *Sidereus Nunci*, 38.

<sup>22</sup> Favaro, *Opere*, 11:87–88 and 11:92–93. On the Jesuits’ telescopes, see Biagioli, *Galileo’s Instruments*, 86–97.

<sup>23</sup> Andrews, *Elsheimer*. Klessmann, *Elsheimer*.

<sup>24</sup> Andrews, *Elsheimer*, 21.

<sup>25</sup> *Ibid.*, cat. no. 24. Klessmann, *Elsheimer*, cat. no. 35.

<sup>26</sup> Andrews, “Inventory.”

<sup>27</sup> Sandrart, *Teutsche Academie*, 1:294. Translation by Andrews, *Elsheimer*, 55.

<sup>28</sup> Andrews, *Elsheimer*, cat. no. 5. Klessmann, *Elsheimer*, cat. no. 13.

<sup>29</sup> Matthew 2:13–21.

<sup>30</sup> Matthew 2:14 (King James Bible).

<sup>31</sup> On the iconographic tradition related to the Flight into Egypt, see Augustyn, “Bildüberlieferung.”





**Figure 2:** The Flight into Egypt (*left*) and The Return from Egypt (*right*) from a *Biblia Pauperum* (Sign.: Fol. max 4, fol. 2<sup>v</sup>, 3<sup>r</sup>), ca. 1340. © Stiftung Weimarer Klassik, Herzogin Anna Amalia Bibliothek.

The Flight into Egypt was a popular theme (the return less so). Dürer dedicated to this subject one of the seventeen woodcuts in his series on the *Life of the Virgin*, published in 1511 (**Figure 3**).<sup>32</sup> Dürer, too, depicted the scene using the common iconography. In the left margin, he added a date palm and, in the right one, a dragon tree, both borrowed from an earlier engraving by Martin Schongauer (ca. 1445–1491) that depicts the same theme (**Figure 3**). In the middle of Schongauer's engraving, the bending of the palm tree from which Joseph is eagerly picking some dates is a detail described in the apocryphal Gospel of Pseudo-Matthew, as is the ox that appears in Dürer's woodcut.<sup>33</sup> Both Schongauer and Dürer thus imagined and added novel details to the theme, leaving their personal mark on the prevailing iconographic tradition.

Elsheimer, too, added his very personal imprint on the iconography of this theme. Around 1605, he had already depicted, in a tiny oval, the fleeing Holy Family under a bright blue sky.<sup>34</sup> Addressing the topic afresh in 1609, with his aptitude for staging the agency of artificial and natural sources of light, he followed the canonical text of the Gospel of Matthew, which stated that the flight took place “by night.”

## Starry Heavens

The depiction of the starry heavens that Elsheimer pictured above the Holy Family was a complete novelty. No earlier artwork had conveyed the impression of an unobstructed gaze into the bright night sky. For this reason, Cavina sensed it was “a topographical view of the sky, which the artist sets out to present to us as a faithful representation of an actual locality.”<sup>35</sup> Elsheimer painted the image in Rome in 1609. Is his depiction of the sky faithful to some actual observation that inspired him? The inclination of the galactic plane towards the horizon and the low full moon to the right of the galactic band have been reproduced in a simple standard simulation by Hartl and Sicka, who argued that these two features would fit a nightly view from Rome to the southeast in the early evening hours on 16 June 1609.<sup>36</sup> Within the multitude of more than a thousand individual stars that Elsheimer scattered over the sky, a few constellations seem to appear every now and then to the seeking eye: Leo in the center, close to the Milky Way, its tail reaching into the band of stars; the Pleiades in the lower left corner; Delphinus halfway between the head of Leo and the full moon; and the asterism known as the Big Dipper or Plough, far above the moon. But none of these constellations is represented in the position in which they would have appeared on the night of 16 June 1609—nor on any other night, as their relation and positioning towards each other, the Milky Way, and the

<sup>32</sup> Panofsky, *Dürer*, 95–104.

<sup>33</sup> Gospel of Pseudo-Matthew, chap. 19–20.

<sup>34</sup> Andrews, “Rediscovered Elsheimer.” Klessmann, *Elsheimer*, cat. no. 23.

<sup>35</sup> Cavina, “Theme of Landscape,” 140.

<sup>36</sup> Hartl and Sicka, “Komposition oder Abbild?”



**Figure 3:** Right: Albrecht Dürer, *The Flight into Egypt*, 1511, woodcut, printed on paper, 29.6 × 21 cm. Left: Martin Schongauer, *The Flight into Egypt*, ca. 1470–90, engraving, printed on paper, 25.5 × 16.9 cm. © Rijksmuseum, Amsterdam.

ecliptic is incorrect.<sup>37</sup> Elsheimer's night sky does not withstand astronomical scrutiny and therefore cannot represent any local and temporal observable sky.

Nevertheless, two specific features of it have drawn special attention: the moon and the Milky Way. First, Elsheimer's depiction of the surface of the full moon with dark and light areas is rather uncommon for its time and seems to contrast with the prevailing idea of an immaculate moon. It was only after the publication of Galileo's *Sidereus Nuncius* and his detailed studies of the waning and waxing moon that its structured surface became accepted. However, the shading of the moon was perfectly visible to the naked eye, even for those who did not understand it as being topographic. The nuances of its surface had already been hinted at in Elsheimer's earlier *St. Christopher*, and, moreover, a few "naturalistic" paintings of the moon had appeared before his time.<sup>38</sup> Textual descriptions also elaborated on the surface of the moon. Plutarch had discussed different opinions on the face of the moon prevalent in antiquity.<sup>39</sup> Johannes Kepler commented extensively on these in his *Optics* published in 1604, adhering to the belief that "the moon was correctly described by Plutarch as the kind of body that the earth is, uneven and mountainous."<sup>40</sup> Elsheimer's rendering of the moon thus cannot constitute any reference to the science of observational astronomy of his time.

Second, the Milky Way in Elsheimer's painting is composed of a band of individual stars. It is impossible to observe it this way with the naked eye. Galileo's enhanced telescopic view first revealed the Milky Way's astral structure. This led Cavina to suspect that Elsheimer had made some changes to his artwork after Galileo published his findings in March 1610. However, a close examination of the image by Deborah Howard has revealed that the trees were painted over the night sky and the continuation of the Milky Way can be seen through the foliage.<sup>41</sup> If the image was indeed prepared in 1609, as the inscription on the

<sup>37</sup> Ibid.

<sup>38</sup> Montgomery, "Drawings of the Moon"; Olson and Pasachoff, "Moon-Struck."

<sup>39</sup> Plutarch, *Face of the Moon*, XII:1–223.

<sup>40</sup> Kepler, *Optics*, 262.

<sup>41</sup> Howard, "Elsheimer's Flight into Egypt."



reverse suggests, then both the moon and the Milky Way were present before Galileo began most of his observations. A convenient solution to this problem, therefore, was to put one of the first telescopes in Elsheimer's own hands to let him observe the sky on his own. His depiction of the Milky Way, in particular, could not otherwise be explained. The art-historical debate, however, lacks the answer to a very important question: how did Elsheimer, his contemporaries, and immediate Renaissance predecessors envisage the night sky and especially the Milky Way?<sup>42</sup>

### The Renaissance Night Sky

In 1515, the first two star maps ever printed appeared. Based on two woodcuts by Dürer, the pair chart the northern and southern hemispheres.<sup>43</sup> In Dürer's maps, the stars are placed in their observed positions in an ecliptic coordinate system in stereographic projection. The course of the Milky Way running from Sagittarius to Gemini through the northern hemisphere is also sketched (Figure 4). Constrained by the affordance of the woodcut, its rough course through the constellations is highlighted only by two encircling lines. Dürer



**Figure 4:** Albrecht Dürer, *Imagines coeli Septentrionales cum duodecim imaginibus zodiaci*, 1515, Northern Celestial Hemisphere, woodcut, printed on paper, 43 × 43 cm. © Rijksmuseum, Amsterdam.

<sup>42</sup> For a cross-cultural comparison of the symbolic aspects of the Milky Way, see Krupp, "Negotiating."

<sup>43</sup> For a detailed analysis of the maps and its precursors, see Gaab, *Sterne über Nürnberg*.

had received all the necessary data from Conrad Heinfogel (?–1517), a vicar from Nuremberg, in the form of two similar maps from 1503 drawn in ink on parchment. Both sets of maps are modeled after the star catalogue of Ptolemy's *Almagest*. Heinfogel's maps, however, did not represent the course of the Milky Way.

In book eight of the *Almagest*, Ptolemy gave a detailed description of the course and form of the Milky Way through the constellations.<sup>44</sup> “Now the Milky Way is not strictly speaking a circle,” Ptolemy began his description, “but rather a belt of a sort of milky color overall (whence it got its name); moreover this belt is neither uniform nor regular, but varies in width, color, density and situation, and in one section is bifurcated.” Ptolemy further described the bifurcated part in the northern hemisphere that forks in Cygnus and does not reconnect to the circle of the Milky Way. Dürer's map of the northern hemisphere, too, shows this branching and in general follows Ptolemy's description almost verbatim.

Dürer not only provided an image of the heavens that allowed the beholder to both read the position of the stars as if from a celestial sphere and follow the path of the Milky Way through the constellations, he also supplied references that characterized the prevailing Renaissance wisdom about understanding and seeing the starry heavens. These references were to the writings of four scholars who are depicted in the corners of the map: the poets Aratus of Soloi and Marcus Manilius in the corners on the left side and the astronomers Ptolemy and Azophi (Abd al-Rahman al-Sufi) in the corners on the right side. While the writings and star catalogues of Ptolemy and Azophi imparted an order to the starry skies that is mirrored in Dürer's maps, the writings of Aratus and Manilius contributed mythological, poetic, and astrological narratives that indicated how the heavens were conceived of and imagined.

Aratus, a Greek poet of the third century BC, wrote the famous didactic poem *Phaenomena*, composed in hexameters, in which he described the constellations and other celestial phenomena as they were perceived in his time. In his description of the Milky Way, he wrote:

If ever on a clear night, when Night in the heavens shows to men all her stars in their brightness and no star is borne faintly gleaming at the mid-month moon, but they all sharply pierce the darkness— if in such an hour wonder rises in thy heart to mark on every side the heaven cleft by a broad belt, or if someone at thy side point out that circle set with brilliants—that is what men call the Milky Way.<sup>45</sup>

Aratus did not reveal precisely what he believed the Milky Way was composed of; instead, he described it figuratively as a belt set with “brilliants.” He also indicated when this glittering belt could be observed, and this was not around the mid-month moon. In the Greek calendar, each month began with the new moon, and, in fact, the Milky Way cannot be observed close a full moon—which is quite contrary to what Elsheimer depicted. His deliberate decision to display the Milky Way and the full moon at the same time is a clear indication that he had no intention of depicting a factual observation. Rather, his painting represents what could only be discerned at different times. And this is indeed what constituted his imagining of the night sky.

Marcus Manilius was a Roman astrologer and poet of the first century AD and is known only by his work *Astronomica*, likewise written in hexameters and divided into five books, which enjoyed a wide audience in the sixteenth century. In book one, he concisely described the circular path of the Milky Way through the constellations of the northern and southern hemispheres. He assembled a set of six different theories about the origin of the Milky Way, such as that it was milk spilled from Juno's breast or a concentration of countless small stars. On the latter, Manilius mused: “Or is it that a greater host of stars has woven its fires in a dense circlet and glows with concentrated light, and that the ring shines the more radiantly for the massing of its brightness?”<sup>46</sup> But which of these ideas from antiquity was the prevailing astronomical wisdom in the Renaissance?

Gregor Reisch's (ca. 1470–1525) widely disseminated encyclopedia *Margarita philosophica*, printed for the first time in 1503 in Freiburg, was intended to summarize the whole of philosophical knowledge of the time in twelve books. It enjoyed great popularity all over Europe as a textbook and was reissued several times throughout the century. In book seven, “On the Principles of Astronomy,” Reisch also included a description of the nature of stars and the Milky Way.<sup>47</sup> All stars—fixed stars as well as planets—were considered to be the denser parts of their spheres that could receive and retain sunlight and thus become visible, while the

<sup>44</sup> Ptolemy, *Almagest*, 400–404.

<sup>45</sup> Aratus, *Phaenomena*, [469–79] 419.

<sup>46</sup> Manilius, *Astronomica*, [1:684–804] 59–69.

<sup>47</sup> Reisch, *Margarita philosophica*, liber VII, tractatus 1, capitulum XIX and liber IX, capitulum XXI.



spheres themselves remained invisible. In concert with this, the Milky Way was made of the same celestial substance, only it was denser than the other parts of the heavens and therefore more luminous. The Milky Way, thus, was not made from the elements or vapor, as was the Aristotelian belief, but was of the same celestial substance as the stars.<sup>48</sup>

The representation of the starry constitution of the Milky Way in vernacular calendars took a very specific form. From about 1512 to 1540, a set of highly popular calendars was printed in at least ten editions under the name of Regiomontanus, who had died long before.<sup>49</sup> All versions unmistakably related the conviction that the Milky Way was composed of individual stars, though too numerous to count. The calendars were printed in Augsburg and Strasbourg with small changes in the text and type across the editions. The woodcut illustrations accompanying the text in the Augsburg and Strasbourg editions differ, but their iconography is identical, having been copied from an edition of Hyginus' *De astronomia*, which was printed for the first time in 1482 in Venice. The illustrations show two women with long curly hair in long garments positioned next to each other. One is seated in a contemplative pose, her head resting in her hand supported by her propped elbow; the other is leaning against a large oval representing the Milky Way, set with individual stars along its circumference (**Figure 5**). In book one of *De astronomia*, however, this image, with its distinct iconography of the Milky Way composed of individual stars, was juxtaposed with a text that described only the mythological narrative of Juno's spilled breast milk.<sup>50</sup> Text and image, thus, were framed in symbiosis—the text explaining the origin of the Milky Way, the image its makeup.

The calendars presented text and image in a unity that left no doubt that the Milky Way consisted of innumerable individual stars. This is made clear in the following description from the 1537 edition:<sup>51</sup>

Circulus lacteus [the Milky Way] a figure of the heavens/is more in Cancer than in Capricorn/and parts the heavens in the middle. It has many stars/but no specific number/therefore it is called only the white road of the heavens. Those who are born under this sign/will always be poor/sick and unfortunate. About this circle the poets romanticize many things/which is esteemed among their kind/yet among those who worship the Creator/none of it applies.<sup>52</sup>

In fact, the iconography of the Milky Way consisting of individual stars did not originate from the manuscript sources of Hyginus' *De astronomia* but is derived from medieval manuscripts of Michael Scotus' (ca. 1180–1235) *Liber Introductorius*. Scotus' iconography of the constellations, which also included the Milky Way, was popularized in Italy through Fazio degli Uberti's (ca. 1309–1367) famous poem *Il Dittamondo*. Between 1435–1437, Guilelmo Capello added an Italian translation of Scotus' text on the constellations, including their iconographic delineations, to the poem.<sup>53</sup> In *Liber Introductorius*, Scotus referred to the Milky Way as the *demon meridianus* that, "although many stars are contained in this part in different aspects," it is ruled by a council of wise spirits. "About the galaxy the poets have various opinions," Scotus continued, "but the following is true, namely that its brightness comes from the juncture of the two hemispheres."<sup>54</sup> Although the vernacular calendars were closely oriented towards Scotus' text and image, they simply dropped the last dictum and only kept the stellar structure.

The conception of the Milky Way as consisting of individual stars was generally shared and widely accepted throughout the sixteenth century.<sup>55</sup> When Girolamo Cardano (1501–1576) met with Edward VI in October 1552 and explained to the young King of England the cause of comets, he drew an analogy to the starry nature of the Milky Way. "It's like what happens in the Milky Way and in the reflection of lights," Cardano told the monarch, according to his own account. "When many candles are lit at the same time, they produce a certain bright white light in the middle."<sup>56</sup>

<sup>48</sup> Aristotle considered the Milky Way an ignited stratum of uppermost air; this is similar to his theory of the tails of comets. See Aristotle, *Meteorology*, [1:345a11–346b15] 1:564–66.

<sup>49</sup> All calendars are available in the *Verzeichnis der im deutschen Sprachbereich erschienenen Drucke des 16. Jahrhunderts (VD 16)*. See numbers VD16 M 6538 to VD16 M 6548.

<sup>50</sup> Hyginus, *De astronomia*, fol. 23<sup>r</sup>.

<sup>51</sup> There are marginal differences in the phrasing of this passage in other editions, but they do not alter its meaning.

<sup>52</sup> Regiomontanus, *Ein newer Kalender*, fol. 16<sup>v</sup>. Unless otherwise noted, all translations are my own.

<sup>53</sup> Cf. Blume et al., *Sternbilder*, 297–306.

<sup>54</sup> Cf. Ackermann, *Sternstunden*, 228–31.

<sup>55</sup> On different theories of the Milky Way from antiquity to Galileo, see Jaki, "Milky Way before Galileo." See also Latura, "Milky Way Vicissitudes."

<sup>56</sup> Quoted in Grafton, *Cardano*, 115.



**Figure 5:** *Top left:* Woodcut from Regiomontanus, *Ein newer Kalender*, Strasbourg edition, 1537. *Top right:* Augsburg edition, 1539. *Middle:* Woodcut from Hyginus, *De astronomia*, Venice, 1482, fol. 23<sup>r</sup>. © Bayrische Staatsbibliothek. *Bottom left:* Illumination from Fazio Degli Uberti, *Il Dittamondo*, Milan: 1447, (BNF Italien 81), fol. 177<sup>v</sup>. © BNF. *Bottom right:* Illumination from Michael Scotus, *Astrologia cum figuris* (BSB Clm 10268), fol. 83<sup>v</sup>. © Bayrische Staatsbibliothek.



The favored poetic or artistic narrative of the origin of the Milky Way that was repeatedly romanticized was the one of the milk being spilled from Juno's breast. In the late 1570s, Jacopo Tintoretto (1518–1594) dedicated the painting *The Origin of the Milky Way* to this mythological theme (**Figure 6**). Juno nurses the infant Hercules and spills her breast milk. Where the milk sprayed across the heavens, it formed the Milky Way. Notwithstanding the mythical narrative, Tintoretto depicted the Milky Way as composed of individual stars. He thereby adapted an iconography that combined both textual and visual aspects of Hyginus' *De astronomia*, which was published in his hometown of Venice a century earlier and reissued several times.

To make his painting on copper and its detailed starry heavens, Elsheimer did not need a telescope. The knowledge on which he based his imagining of the night sky was fairly common and traditional. This will become even clearer in the discussion below on his immediate contemporaries and what was later discerned with a telescope.

### Astronomical Perceptions

One of the most respected figures in astronomy during Elsheimer's time was the Jesuit Christoph Clavius (1538–1612), a mathematician at the Collegio Romano in Rome. His books were widely published, and he was recognized as an authority.<sup>57</sup> Clavius was unwavering in his opinion on the nature of the Milky Way. In his *In Sphaeram Ioannis de Sacro Bosco commentarius*, printed as early as 1570, he made clear to his readers that most astronomers considered the Milky Way to be composed of a myriad of tiny stars. Without denying the prevailing wisdom, however, he found it more likely that it was made up of a continuous stellar



**Figure 6:** Jacopo Tintoretto, *The Origin of the Milky Way*, ca. 1575, oil on canvas, 149.4 × 168 cm. © National Gallery, London.

<sup>57</sup> Lattis, *Clavius*.

substance. The book was revised and republished seven times under Clavius' authority, with the last two revisions printed in Rome in 1607 and in Cologne in 1611. The passage on the Milky Way remained unaltered in all editions. In the 1607 edition, which appeared two years before Elsheimer painted his *Flight into Egypt*, Clavius wrote:

Indeed the whiteness from which the Milky Way takes its name results, as favored by many, from an extraordinary heap of small stars, which are contained in it and which do not reach our sight distinctly like the other stars. I, however, along with others, judge as more probable that the Milky Way is a continuous part of the firmament, and denser than the other parts of heaven, such that it can receive the light of the sun, but unlike the other stars, which are much denser parts of the firmament and distant from one another; whatever the poets romanticize about Juno's milk and the combustion caused by the sun.<sup>58</sup>

For Clavius, the Milky Way was part of the firmament and not, as Aristotle had claimed, a sublunar phenomenon in the region of the air. Therefore, Clavius argued, the Milky Way was always discernible among the same fixed stars of the firmament—with no observable parallax. Following Ptolemy, Clavius continued to name the constellations through which the Milky Way ran and quoted the part of Manilius' poetic verses from the *Astronomica* that figuratively described its course through the heavens. He also quoted Ovid's mythological reference to the Milky Way as the path of the gods in the *Metamorphoses*. Finally, he advised all those who wished to know more about the Milky Way and the various opinions about it to consult Johannes Stöffler's (1452–1531) commentary on (Pseudo-) Proclus' *Sphaera*, published in 1534, which gave an extensive summary of classical and medieval writings on the Milky Way.<sup>59</sup>

Stöffler, in turn, clearly adhered to the prevailing view that the Milky Way consisted of individual stars. He believed that Albertus Magnus had already put an end to the debate and had given the final explanation of the cause of the Milky Way. Stöffler agreed that “[t]he efficient cause, in part, are the many small stars ... that diffuse their light across the space in that part of the orb. The other part of the efficient cause is the radiation of the sun that falls on the almost contiguous stars.”<sup>60</sup>

Bernadino Telesio (1509–1588) held a similar belief to Clavius'. In his *De cometis et lacteo circulo*, written around 1580 and published posthumously in a collected volume by his follower Antonio Persio (1542–1612) in 1590 in Venice, Telesio described his understanding of the nature of the Milky Way as a condensation of celestial matter within the sphere of the stars.<sup>61</sup> In the third edition of his major work *De rerum natura*, published in 1586, Telesio incorporated and refined his conception of the Milky Way: “And that the highest part of the sky revolves around with the stars is shown clearly by the Milky Way, which indeed no one can doubt to be a portion of the sky which is made a little bit denser than the other ones and for this reason more shiny; and it appears to revolve with those stars which are located in it.”<sup>62</sup> Elsheimer's friend Johannes Faber himself was an adherent of Telesio's natural philosophy and was familiar with his writings. He kept a copy of his *De rerum natura* in his personal library even though it was listed on the Index of Prohibited Books.<sup>63</sup> He often met with his followers and was also entrusted to prepare Persio's manuscripts for publication by Frederico Cesi.<sup>64</sup>

Thus by 1609, when Elsheimer pictured his night sky in his *Flight into Egypt*, there was a well-established corpus of vernacular and scientific writings available that maintained that the Milky Way was composed of innumerable tiny stars. However, the belief that the Milky Way was a denser part of the firmament, to which Clavius and Telesio adhered, remained a defensible alternative.

In *Sidereus Nuncius*, first published on 13 March 1610 in Venice, Galileo reported the optical resolution of the Milky Way into individual stars, which he had observed with a twenty-power telescope. Despite the revolutionary step in doing so, he offered nothing that was new or unexpected. Galileo himself, thus, did not try to create a sensation about it; he merely took a few lines to describe his observation:

<sup>58</sup> “Candor vero eius, à quo lactei nomen habet, provenit, ut nonnullis placet, ex multitudine nimia stellarum exiguarum, quae in ipso continentur, & ad nostrum visum distinctae non perveniunt, sicut caeterae stellae...” Clavius, *Sphaera*, 369–70.

<sup>59</sup> Stöffler, *Sphaera*, 69<sup>b</sup>–72<sup>f</sup>.

<sup>60</sup> “Causa eius efficiens, sunt in parte stellae multae parvae ...” Stöffler, *Sphaera*, fol. 72<sup>r</sup>. For a summary of commentators on the Milky Way before Galileo, see Jaki, *Milky Way*, 1–103.

<sup>61</sup> Telesio, *Cometas*, cvi–cvii.

<sup>62</sup> “Et supremam caeli portionem cum stellis circumvolvi lactea manifestat via...” Telesio, *De rerum natura*, 1:46.

<sup>63</sup> On Faber's inventory, see Gabrieli, *Accademia dei Lincei*, 2:1224–26.

<sup>64</sup> Galluzzi, *Lynx and Telescope*, 67–72.



What was observed by us in the third place is the nature or matter of the Milky Way itself, which, with the aid of the spyglass, may be observed so well that all the disputes that for so many generations have vexed philosophers are destroyed by visible certainty, and we are liberated from wordy arguments. For the galaxy is nothing else than a congeries of innumerable stars distributed in clusters.<sup>65</sup>

In fact, the “wordy arguments” and “disputes” of antiquity had already condensed into the distinct and widely accepted doctrine of the Milky Way being composed of innumerable individual stars. Kepler, commenting on Galileo’s book in his *Dissertatio cum Nuncio Sidereo*, published in May 1610, lauded Galileo’s observations on the nature of the Milky Way and nebulae: “You have conferred a blessing on astronomers and physicists by revealing the true character of the Milky Way, the nebulae, and the nebulous spirals.” Though, in the very next sentence Kepler eloquently added: “You have upheld those writers who long ago reached the same conclusion as you: they are nothing but a mass of stars, whose luminosities blend on account of the dullness of our eyes.”<sup>66</sup> After the publication of the *Sidereus Nuncius*, Johannes Schreck (1576–1630), an associate of Faber in Rome who would later join the Linceans, asked Giovanni Camillo Gloriosi (1572–1643) for his opinion of Galileo’s book.<sup>67</sup> Gloriosi, who would later follow Galileo in the chair of mathematics in Padua, replied on 29 May 1610. With apparent disdain for Galileo, Gloriosi declared that many of the pronouncements made in the *Nuncius* were not new. “Neither should it be promulgated as a mysterious novelty what he writes about the Milky Way and the greater number of fixed stars,” Gloriosi made clear in his letter, “as if this had not been noticed by the old writers, inasmuch as everywhere the opinions and controversies of those who thought about it are known.”<sup>68</sup> In the first published attack on Galileo’s book, Martin Horky, albeit in a deliberate attempt to discredit the author, wrote in his *Brevissima Peregrinatio Contra Nuncium Sidereum*, licensed on 18 June 1610, that “we all know, that it has been the longstanding consensus of all philosophers and mathematicians that the Milky Way was a congeries of an infinite number of small stars.”<sup>69</sup> In his spite, Horky oversimplified the issue and muted differing voices such as Clavius, though his point was not unjust.

### Jacob’s ladder

Elsheimer did not need Galileo to tell him about the origin of the Milky Way, and he did not need a telescope. He relied on what everyone commonly already knew. His visual perception, his imagination, and his picturing of the starry heavens were all rooted in a well-established corpus of common astral knowledge. In his painting, Elsheimer realized a visual transformation of the prevailing knowledge from educational, vernacular, and scientific writings and thus unintentionally turned his artwork, within the affordance of his copper plate, into an epistemic image.<sup>70</sup>

The sought-after scientific timeliness and legitimacy of Elsheimer’s painting has obscured its art historical relevance. Elsheimer’s depiction of the starry heavens is an iconographic means of accentuating the biblical story by adding to the visual narrative.<sup>71</sup> Unlike in many other depictions of *The Flight into Egypt* (Figures 2 and 3), in Elsheimer’s painting, Joseph is not guiding the Holy Family by leading a donkey with a bridle but trotting behind them. It is not he but the divine light of the heavens that guides, navigates, and protects them on their perilous journey. In fact, Elsheimer had initially planned for Joseph to guide the family, but then decided to let him follow after them, a change that has been revealed by an infrared scan of the image.<sup>72</sup>

The Milky Way that appears conspicuously above the Holy Family is the path to heaven on which God’s angels travel between earth and heaven, overseeing the fugitive family on their journey. In Scripture, it appears to Jacob, patriarch of the Israelites, in his dream: “And he dreamed, and behold a ladder set up on the earth, and the top of it reached to heaven: and behold the angels of God ascending and descending on

<sup>65</sup> Galilei, *Sidereus Nuncius*, 62.

<sup>66</sup> Kepler, *Conversation*, 36.

<sup>67</sup> Schreck most likely acted on behalf of Clavius to whom Gloriosi had explicitly sent his regards in his last letter to Schreck written one month earlier. See, Collani and Zettl, *Terrentius*, 380.

<sup>68</sup> Favaro, *Opere*, 10:363–64. For a German translation of other extant letters from Gloriosi to Schreck, see Collani and Zettl, *Terrentius*, 378–84.

<sup>69</sup> Favaro, *Opere*, 3(1):135. Translation by Jaki, *Milky Way*, 108.

<sup>70</sup> Cf. Daston, “Epistemic Images.”

<sup>71</sup> See also Howard and Longair, “Flight into Egypt.” That Elsheimer’s night sky is merely symbolic is also argued in Sauerländer, “Flucht nach Ägypten.”

<sup>72</sup> Klessmann, *Elsheimer*, cat. no. 36.

it.”<sup>73</sup> Around 1598, in his early German years, Elsheimer devoted a small painting on copper to this biblical subject in which he rendered the Milky Way literally as a ladder into the heavens on which the angels walk.<sup>74</sup> When Rubens later looked at Elsheimer’s *Flight into Egypt*, he did not regard it as a scientific rendering, but purely as biblical iconography. In Rubens’ own version of the topic from 1614, he thus placed two angels, already descended to earth, just ahead of the Holy Family, leading them on their perilous journey (**Figure 7**). One of the angels is leading the donkey with a bridle while Joseph follows, after turning towards the moon nearing First Quarter. The divine guidance and navigation that Elsheimer implied with his depiction of the Milky Way, Rubens rendered in a more explicit iconography by letting the angels lead the Holy Family.

In 1613, Hendrick Goudt (1583–1648) engraved a copy of Elsheimer’s image (**Figure 8**). Goudt had been working for Elsheimer and had lived in his household since at least 1607.<sup>75</sup> When he returned to his native country, the Netherlands, after Elsheimer’s death, he took *The Flight into Egypt* with him.<sup>76</sup> The inscription he added underneath his engraving made unmistakably clear how he perceived Elsheimer’s painting: “In darkness flees the Light of the World, and miraculously the Lord of the world hides with Pharaoh the tyrant. In times of adversity, hence, follow the example of Christ, who always was followed by the wrath of fate.” A contemporary and intimate of the artist, Goudt saw in his *Flight into Egypt* a religious narrative with a distinct iconography of divine guidance and protection.

In 1675, when describing the image, Joachim von Sandrart referred to the Milky Way exclusively as “Jacobs-Straße,” (literally Jacobs’ Road), thus indicating his conception of a biblical iconography that Elsheimer implied in his depiction of the starry heavens.<sup>77</sup> In his dream, when Jacob saw the ladder to heaven, he also saw the Lord standing at its top, who spoke to him: “Behold, I am with you and will keep you wherever



**Figure 7:** Peter Paul Rubens, *The Flight into Egypt*, 1614, oil on panel, 40.5 × 53 cm. © Museumslandschaft Hessen Kassel.

<sup>73</sup> Genesis 28:12 (King James Bible).

<sup>74</sup> Andrews, *Elsheimer*, cat. no. 3. Klessmann, *Elsheimer*, cat. no. 5.

<sup>75</sup> A census of Elsheimer’s household in 1607 and 1609 includes Goudt among the inhabitants. See Andrews, *Elsheimer*, 47.

<sup>76</sup> *Ibid.*, 38–40.

<sup>77</sup> Sandrart, *Teutsche Academie*, 1:295.





**Figure 8:** Hendrick Goudt, *The Flight into Egypt*, 1613, engraving and etching, printed on paper, 34.7 × 40.3 cm. © Rijksmuseum, Amsterdam.

you go, and will bring you back to this land. For I will not leave you until I have done what I have promised you.”<sup>78</sup> This combination of heavenly guidance, navigation, and protection is essential to the iconology that Elsheimer aimed for at the outset of his artistic process and that his contemporaries clearly discerned.

## Conclusion

The debate about the astronomical relevance of Elsheimer’s night sky has been based mainly on the historiography of scientific achievements and a desire to find not only theological symbolism but also the scientific legitimacy in the image. A narrative of scientific achievements has been favored over artistic practices and vernacular knowledge. Visitors to the Alte Pinakothek in Munich, where the painting is exhibited, therefore read that “Elsheimer’s richly detailed depiction of the firmament and the Milky Way is based on observations by Galileo Galilei and Frederico Cesi using the telescope that had just been invented.”<sup>79</sup> This essay has shown conventional wisdom to be mistaken by investigating the interactions of astronomical science with other forms of astral knowledge in vernacular ideas and visual culture. By setting Elsheimer’s theological symbolism and idiosyncratic artistic practice alongside this history of astronomy, it presents a case study for the history of knowledge and the mutual dependence and shifting relations of different types of knowledge, their boundaries and hierarchies.<sup>80</sup>

For the visual conception of his *Flight into Egypt*, Elsheimer drew on the faculty of his imagination based on the common knowledge of his time. His artwork thereby contributed to the production and transformation

<sup>78</sup> Genesis 28:15 (English Standard Version).

<sup>79</sup> As of 18 November 2018.

<sup>80</sup> Daston, “History of Science and Knowledge.” Dupré and Somsen, “History of Knowledge.”

of knowledge within the visual culture that surrounded him and in which he used his art and practice to describe how the heavens were imagined and perceived.<sup>81</sup>

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<sup>81</sup> Cf. Alpers, *Art of Describing*.



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