

## NOTES FOR A CHRONOLOGY OF THE TELESCOPE-MAKING ACTIVITIES OF THE NEAPOLITAN OPTICIAN FRANCESCO FONTANA

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**Abstract:** In the last few years it has been alleged that the sitter in Jusepe de Ribera's *Allegory of Sight* painting is the Neapolitan optician Francesco Fontana (ca. 1585–1656), who is well-known for contributing to the diffusion of the Keplerian telescope. The present paper demonstrates the impossibility of this identification, based mainly on the erroneous assumption that Fontana was already renowned as an optician by the mid-1610s. Instead, we suggest a more reasonable chronology for his activities, which postpones the spreading of his fame out of Naples until the end of the following decade.

**Sommario:** Da alcuni anni è stata avanzata l'ipotesi che l'uomo raffigurato nell'*Allegoria della vista* di Jusepe de Ribera possa essere identificato con l'ottico napoletano Francesco Fontana (ca. 1585–1656), noto per aver contribuito in maniera determinante all'affermazione del telescopio kepleriano. Nel presente articolo si tenta di dimostrare l'impossibilità di tale identificazione, basata sull'assunto erroneo che Fontana fosse un ottico affermato già nella metà degli anni '10 del XVII secolo e si suggerisce una più convincente cronologia della sua attività, secondo la quale la sua fama si diffuse al di fuori della città di Napoli solo alla fine del decennio successivo.

**Keywords:** Francesco Fontana, history of Keplerian telescopes, Jusepe de Ribera, Fabio Colonna

### 1 THE TWO PORTRAITS

Paolo Molaro is an Italian astrophysicist at the Astronomical Observatory of Trieste who has analysed the life and the work of the Neapolitan optician Francesco Fontana (ca. 1585–1656), known for contributing in a decisive manner to the emergence and diffusion of the Keplerian, or astronomical, telescope (i.e. with a converging eyepiece). In a conference paper presented in 2016 Molaro (2017a) suggested that Fontana may be the person depicted in the painting, the *Allegory of Sight* (Figure 1), by the famous Spanish Tenebrist painter Jusepe de Ribera (1591–1652), known in Italy as Lo Spagnoletto. Subsequently, Molaro (2017b) elaborated on this theme in a paper published in this journal.

This speculation does not originate from one or more previously unknown sources, or from the reinterpretation of already known ones, but merely from a suggestion made by Molaro (2017b: 284): “We note here that the sitter in *The Sight* by Ribera bears a close resemblance to the self-portrait made by Fontana for his book [Figure 2].”<sup>1</sup> However, Molaro (2017b: 286) does acknowledge that this alleged resemblance is somewhat problematic:

The shape of the head and the characteristics of the face and of the gaze are strikingly similar. One main difference between the two portraits lies in the hair. However, Fontana in 1646 presented himself as he looked in 1608 (i.e. almost 40 years younger), and the simplest way to look younger is by adding hair. Anyway, the possible Fontana in the painting by Ribera should be a few years older. Also, the ears are different, but it must be considered that

Fontana's self-portrait cannot be compared to those of one of the most talented painters of his times. Thus, although it is generally believed that Ribera took his models from everyday life, it cannot be excluded that for the specific subject of the *Allegory of Sight* Ribera took inspiration from the figure of Fontana, who by this time was already a renowned telescope-maker ... A telescope decorated with gold is not something that can be associated with a man from the street since at that time it was very precious and was a symbol of power. We admittedly prefer the possibility that the man in Ribera's portrait could be the inventor of the *astronomical* telescope.

Actually, despite what Molaro may claim, the facial features of the two men are anything but similar, and the two faces look alike in the same way two random faces, seen head-on, look alike: two eyes, a nose and a mouth. The man portrayed by Ribera, for instance, has an evidently aquiline nose, definitely different from that in Fontana's self-portrait, and the eye shape is quite different too. In any case, as Molaro himself admits, the two portraits show significant differences, at least in the ears and in the hair.

As for the ears, we have seen that Molaro attributes the difference to Fontana's poor pictorial skills. However, a first question arises: if Fontana (or whoever made his portrait)<sup>2</sup> was not so good in drawing, then how reliable is this self-portrait? In other words, since Fontana's depiction might diverge significantly from his true face, does it make sense to compare the two representations?



Figure 1 (left): The *Allegory of Sight* by Jusepe de Ribera, oil on canvas, 114 cm x 89 cm (courtesy: Franz Mayer Museum, Mexico City).

Figure 2: Portrait of Francesco Fontana from the *Novae Coelestium Terrestrialiumque Rerum Observationes* (1646) (courtesy: Deutsche Museum von Meisterwerken der Naturwissenschaft und Technik, München).

The issue of the hair is definitely much more problematic: the receding hairline of Ribera's sitter differs markedly from the full head of hair in the self-portrait. This is rather odd, since the former was made thirty or more years before the latter, and not the reverse. How can we explain that? According to Molaro (2017b: 286), such a difference between the two portraits could be due to Fontana's attempt to represent himself as he looked almost 40 years earlier, i.e. at the time of his alleged invention of the astronomical telescope, i.e. in 1608. In other words, Fontana thickened the hair in his self-portrait on purpose in order to make himself look about 40 years younger.

What does Molaro base his statement on? Actually, he offers no explanation for this, unless this conjecture depends on his interpretation of the inscription around the portrait, which reads:

FRANCISCVS FONTANA NEAPOL-  
[ITANVS] NOVI OPTICI TVBI  
ASTRONOMICI INVENTOR AN[NO]  
DOM[INI] MDCVIII[ET] SVÆ 61.

The most obvious way to translate this is as:

Francesco Fontana, from Naples, inventor,  
in the year 1608, of a new [kind of] astro-  
nomical telescope, at the [current] age of 61.

However, other authors had previously suggest-

ed alternative interpretations. In a short essay, the eminent scholar Antonio Favaro, editor of the National Edition of Galileo's works, admits the possibility that the two digits indicating Fontana's age could be read upside-down, i.e. as '19' instead of '61' (Favaro, 1992: 424).<sup>3</sup> But in this case—since, for obvious reasons, Fontana could not have been just nineteen years of age in 1646, when he published his *Observationes*—'19' would have to refer to his age in the year 1608. In other words, although Favaro does not state it explicitly, if we read '19' instead of '61', we must translate the inscription as follows:

Francesco Fontana, from Naples, inventor,  
in the year 1608, when he was 19 years old,  
of a new [kind of] astronomical telescope.

Maybe it was these same doubts around thirty years earlier that had caused Riccardi (1870: 467), in his famous *Biblioteca Matematica*, to declare that he could not infer Fontana's date of birth from the inscription surrounding his portrait.

In my opinion, incidentally, there is no special reason why the number indicating the age must be read upside down in relation to the immediately preceding and following words, as attested by other examples of similar portraits, in which the age of the person, written in the lower part of the oval frame, cannot be misun-



derstood. We see an example of this in the inscription surrounding the portrait of Giovanni Battista Della Porta in the frontispiece of the 1677 Italian edition of his *Magia naturalis* (Della Porta, 1677), as shown here in Figure 3. But this is not the point. The point is that the doubt, mildly expressed by Favaro and possibly by Riccardi, concerns exclusively the orientation of the two numbers. As a matter of fact, neither Favaro nor Riccardi (nor anyone else) ever suggested that, even if reading '19' instead of '61', the portrait shows Fontana's appearance at that age, but only that he possibly was nineteen in 1608. In other words, also in this interpretation, like in the previous one, it is understood that the effigy shows Fontana as he looked at the time of publication of the *Observationes*.<sup>4</sup> Instead, as we have seen, in order to justify the marked difference between the two portraits, Molaro, was forced to interpret the inscription as:

Francesco Fontana, from Naples, [shown here as he looked] in 1608, at the age of 19 years old, when he invented a new [kind of] astronomical telescope.

Even apart from the strained (and, in my opinion, incorrect) interpretation of the inscription, other arguments can be raised against Molaro's thesis. For instance, there appears to be a problem with the apparent ages of the two men. It seems to me that the person portrayed in the engraving does not look like a nineteen-year-old, but rather a more mature person (as, among other things, the bags under his eyes seem to suggest). On the other hand, as Molaro already noted, if we assume that Fontana was nineteen years old in 1608, we must presume that "... the possible Fontana in the painting of Ribera should be few years older." (Molaro, 2017b: 286). To be exact, Ribera's *Allegory of Sight* is believed to have been painted between 1615 and 1616 or even earlier,<sup>5</sup> so the man of the painting should be aged between 26 and 27, or even younger. However, it is difficult to believe that the person depicted by Ribera is a young man, in his mid-twenties, unless one wishes to doubt Ribera's talent as a portraitist—just like Molaro doubts Fontana's skill in self-portraiture.

Nor does Molaro realize that some of his statements are contradictory. For instance, in the original version of his paper, titled "Francesco Fontana and his astronomical Telescope" (available at: <https://arxiv.org/abs/1704.05661>; accessed: 23 February 2022), Molaro refers to the refined telescope that the man in the painting is supporting with both hands, and claims that he is holding it "... on the wrong side ..." (page 19). Actually, it is true that, when observing through a hand-held spyglass, usually (but not necessarily) the palm of the hand is facing

downwards and not upwards, as in the painting. However, since the instrument is held at chest level, such a position of the hand on the tube of the telescope would have forced the sitter to adopt an ungraceful posture, to the detriment of the painting's composition. Besides, the telescope is definitely of Italian workmanship, and, therefore, the objective lens is contained in the main tube, which in the painting is correctly depicted at the far end, away from the observer. Anyway, even though it is difficult for us to believe that so simple a device would have been so mysterious to the man in the painting that he did not understand the right way of using it, let us assume that Molaro's interpretation is correct. Then, if the man in the painting really

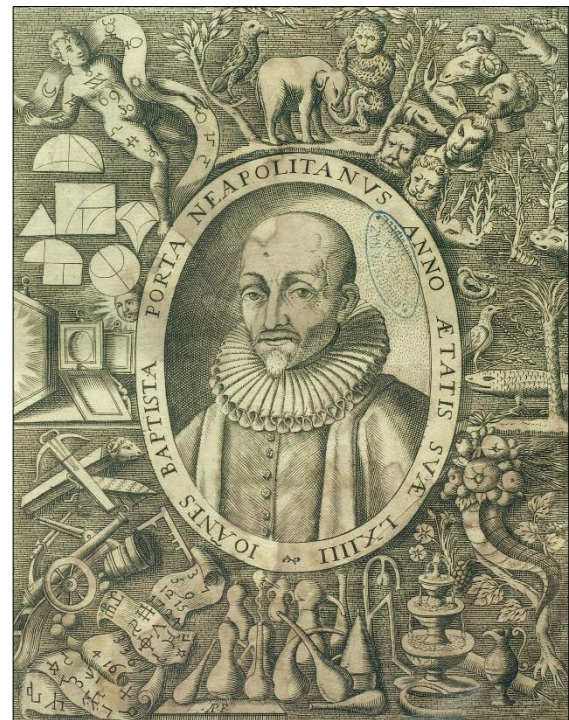


Figure 3: Portrait of Giovanni Battista Della Porta from the frontispiece of the *Magia Naturale* (Della Porta, 1677) (courtesy: Biblioteca Nazionale Centrale di Roma).

was Fontana, is it plausible that he would have purposely held the telescope the wrong way round? Of course, it could be argued that Ribera painted in the telescope later, after he had finished painting the sitter, but if this were the case, is it likely that Fontana never saw the canvas again, and therefore was able to alert Ribera to this serious error?

Fontana always lived in Naples, so Molaro (2017b) concluded that if he posed for the *Allegory of Sight* the canvas was painted, or at least finished, in Naples. Although this is possible, in Molaro's opinion this hypothesis is corroborated not by stylistic arguments, but by the seascape purported seen through the window on the right (since—contrary to Rome—

Naples is on the coast). However, the landscape outside the window (Figure 4) does not look like a seascape. Rather, the presence of trees so close to the water is more reminiscent of a river (the Tiber?) or a lake, and the region around Rome is rich of lakes. But even if this was supposed to depict a seascape, it should not be construed as a faithful representation of an actual place, but rather as a symbolic element, dare I say 'mandatory' in an allegory of sight, the sense of long distances and vast spaces *par excellence*. It is no coincidence that the *Allegory of Sight* is the only painting in Ribera's series of the five senses that has a



Figure 4: Detail of the *Allegory of Sight* by Jusepe de Ribera (courtesy: Museo Franz Mayer, Mexico City).

window, without which the view would have been restricted to the narrow space delimited by the two walls that forms the background of the painting. An analogous function is carried out by the high opening, round arch of in the *Allegory of Sight*, depicted by Brueghel the Elder (1568–1625) in the same years in which Ribera painted the *Allegory of Sight*, and by the wide double round arch window on the right of the painting in the *Allegory of Sight* depicted in around 1660 by Jan Brueghel the Younger (1601–1678).

Finally, we have Molaro's (2017b: 286) argument according to which

A telescope decorated with gold is not something that can be associated to a man from the street since at that time it was very precious and was a symbol of power. We admittedly prefer the possibility that the man in Ribera's portrait could be the inventor of the *astronomical* telescope.

The truth is that everything in the man of the painting—including his strong and virile hands and his attire, in contrast to the refined elegance of the doublet in Fontana's self-portrait—reminds us of 'a man of the people'. Thus, in this case, Ribera does not seem to have made an exception to his custom of choosing everyday sitters, depicted in their raw realism. Art historians agree on this point. For example, Spinosa (2006: 19; my English translation) describes the sitter as

... a grim character, with thin hair, large ears, the face burned by the wind and the sun, tattered clothes ... maybe a farmer, a meat or offal dealer or a grain merchant?—called to represent the sense of sight and who now ... he is pensively holding, in his rough and swollen hands, a telescope of the finest workmanship.

Meanwhile, Papi (2007: 165; my English translation) refers to him as

... a physiognomy that is anything but intellectual, who handles the instrument [i.e. the telescope] as if it were a work tool or even a weapon.

## 2 THE ONSET OF FONTANA'S ACTIVITIES AS A TELESCOPE-MAKER

Up to this point, I have focused on the two portraits when discussing Molaro's claims. I will now address his thesis by means of a number of extra-pictorial sources. The possibility that a great painter like Ribera would deliberately want Francesco Fontana as a model for his *Allegory of Sight* implies that by 1615 or even a little earlier Fontana was already a famous maker of optical instruments—so famous, in fact, that he was known outside the restricted circle of Italian astronomers and naturalist. Is there any evidence for this?

First of all, we learn from Lorenzo Crasso (1666: 297) that Fontana tried to obtain Giovanni Battista Della Porta's optical tools after the latter died in February 1615. But this would seem rather unlikely if Fontana was already a successful optician at that time. On the other hand, if this episode is true then it is much more reasonable to suppose that Fontana hoped to find out the actual or presumed optical secrets of the Neapolitan philosopher and/or that he wanted the tools so that he could set up his own optics workshop. Anastasio (1997: 652) seems to be of the same opinion when she claims that



the attempt was evidently to obtain instruments and tools to start up his own business at that time. Moreover, she takes as an indirect chronological confirmation of this hypothesis a letter written by Evangelista Torricelli to Raffaello Magiotti on 6 February 1644, in which a telescope lens is described as "... the best ever made by Fontana in a thousand glass over a period of 30 years." (*ibid.*).

Other indications that seem to indicate that by 1615 Fontana was not so renowned as Molaro claims, are contained in three letters to Galileo from Fabio Colonna (a fellow-citizen and member of the Accademia dei Lincei). In the first of these, dated 3 August 1613, Colonna writes:

I observed many sunspots and the spots of the Moon as well, even though *in Naples there is no one who can make perfect telescopes*, therefore we could not see the new stars [i.e. the Galilean satellites of Jupiter]; three days ago I began to make by myself, to try, if I can, the convex clear without that little cloud; and I find many flaws both in the glasses and in their manufacture, and I commissioned some lenses eight and ten palms in diameter.<sup>6</sup> All of them turn out to be flawed, or dark. (*Colonna, 1613a: 446; my italics*).

A few weeks later, in a letter dated 25 September 1613, where he reports on his progress in manufacturing telescope lenses, *Colonna (1613b: 464)* reaffirms that "... in Naples there is no one who can be taught [to make telescopes], because there is no one who is both a theorist and a practitioner." Finally, two years later, on 14 August 1615, Colonna writes to Galileo that he is working on a new 14-palms telescope and regrets the lack of good glasses and good lathe turners, able to make copper molds to grind lenses (*Colonna, 1615*). In other words, in the summer of 1615 Colonna complained about the utter lack of Neapolitan craftsmen capable of producing lenses suitable to astronomical purposes.

Furthermore, there is a complete absence of any reference to Francesco Fontana in the correspondence of Italian astronomers and scholars during this decade. This is why *Molaro (2017b: 284)* is compelled to introduce yet another *ad hoc* hypothesis, that "... it is quite possible ... that Fontana's instruments reached the far courts in northern Europe even before other places in Italy." But we have to wonder how Fontana could become known outside of Italy without first establishing a reputation in his home city of Naples. And, besides, we are not aware of any mentions of him by European authors during the 1610s. In this regard, we note that in a letter dated 25 March 1634 the Jesuit

astronomer Christoph Scheiner (1573–1650) writes to Athanasius Kircher (1602–1680): "I know nothing about the Neapolitan marvel." (*Scheiner, 1634; my English translation*). So in Vienna in 1634 one of the preeminent scholars of that time had not yet heard of Fontana's telescopes. Only more than a decade later, in 1646, would *Kircher (1671: 727; my English translation)* rank Torricelli and Fontana as "... very excellent artisans ..."

The lack of any reference to Fontana's activities persisted throughout the ten years following Ribera's painting of *The Sight*, and indeed the first known mention of Fontana as an optical instrument-maker is in a letter dated 17 July 1626 from Colonna to Federeico Cesi (1585–1630), one of the founders of the Accademia dei Lincei:

God willing, I will send Your Excellency a microscope, for which I am making the base and the screw tube, and that will be no more than four fingers in length, through which one can observe all day long without tiring the eyes, and it produces upright images: it has been *invented by a friend*, whom I am also helping to print his invention, since he wanted to make one [microscope] just like those of the Colognians [i.e. the brothers opticians Abraham and Jacob Kuffler], but, having failed to know its secret, kept investigating and discovered a better one. (*Colonna, 1626a; my italics*).

Two months later, on 19 September 1626, Colonna wrote to Cesi:

This friend [whom he identifies as Francesco Fontana] has also invented another [kind] of *occhiale*, only one palm long, which produces upside-down images, but magnifies objects very much, and, what is most remarkable, it shows them so near that those which are as far away as a musket shot are seen close to the eyes. (*Colonna, 1626c*).

The above-mentioned letters pose a number of interesting questions. First of all, why, in both of them, does Colonna refer to Fontana as "un amico" (a friend) instead of calling him by name, as might be expected if the Neapolitan optician already was famous? Moreover, Colonna, refers to Fontana as his friend in at least in two other letters: one to Cesi, dated 22 August 1626 (*Colonna, 1626b*) and the other to Francesco Stelluti, dated 29 January 1627 (*Colonna 1627*). Furthermore, in the aforementioned letter of 17 July 1626, Colonna claims that he is helping Fontana "... to print his [alleged] invention ...", which suggests that Fontana's microscopes—and certainly his telescopes—were largely unknown in Naples at that time.

A second and much more interesting question is: if Fontana was already renowned for his

telescopes from the mid-1610s, why then, about ten years later, in September 1626, did he show Colonna an instrument only one-palm in length? And why was Colonna—who had been making telescope himself for a dozen years and certainly was familiar with practical optics—so impressed with so small an instrument? Why did he not mention other larger telescopes made by Fontana? Probably this was because the small one-palm telescope that Fontana showed Colonna was one of the first he made, if not even the first-ever one, at least of high performance.

From the above I think it can be concluded beyond a reasonable doubt that the onset of Fontana's optical business began much later than the mid-1610s, and that it only started about ten years later, around 1625 or shortly earlier, and probably initially as a maker of microscopes. Certainly, this is more consistent with the chronology of Fontana's successive accomplishments: the appearance of his first 8-palm telescopes in autumn 1629 (Colonna, 1629), a 14-palm in summer 1638<sup>7</sup> and a 22-palm the following year (for a chronology of Fontana's production see Del Santo, 2009).

### 3 CONCLUDING REMARKS

In this paper we have shown that there is no evidence to support the position advocated by Molaro (2017b: 275) that Francesco Fontana invented, made and used the astronomical telescope before it was conceived of by Johannes Kepler in 1611, and possibly even before Harriot and Galileo. This entire interpretation is based on a number of *ad hoc* assumptions by Molaro, who also accepted without question some of Fontana's own claims.

Accordingly, there is no reason to hypothesize that in the mid-1610s Jusepe de Ribera, one of the most influential artists of that time, decided to use Fontana as a model for his *Allegory of Sight*.

On the contrary, there is persuasive evidence that around 1615 (when the portrait was painted) Fontana was totally unknown as a telescope-maker in Italy or abroad, even within the inner circle of specialists.

We have also shown, on the basis of surviving sources, that the spread of Fontana's fame only occurred at the end of the following decade.

If to Molaro's fictitious claim we add the alleged use of Keplerian telescopes in Italy by Fabio Colonna from as early as October 1614 (Gargano, 2019: 54; c.f. Del Santo, 2021), and the equally untenable claim by Molaro and Selvelli (2011: 331–332) that this type of telescope

was in production in Italy from 1617 or even earlier, what emerges is a seemingly consistent, yet totally incorrect, picture of early telescope production and use in Italy. If this picture is left unchecked and unchallenged, we are in danger of writing and accepting a totally fabricated history not only of Fontana's work, but also of the early history of the astronomical telescope.

### 4 ACKNOWLEDGMENTS

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### 5 NOTES

1. The book to which Molaro refers is Francesco Fontana's, *Novæ Cœlestium Terrestriumque Rerum Observationes, Et Fortasse Hactenus Non Vulgatæ* (Neapoli, apud Gaffarum, 1646).
2. Fontana's portrait in the *Observationes* is actually a copper engraving. Molaro always refers to this as a self-portrait, even though it is unsigned, and probably was made by an anonymous professional engraver. At any rate, from now on I, too, will refer to it as a 'self-portrait' for the sake of convenience.
3. Actually, in a footnote, copying the inscription surrounding Fontana's portrait, Favaro (1903) writes: "Franciscus Fontana Neapol. novi optici tubi astronomici inventor A, Dom. M.DC.VIII. Aet. suae 61 (or 19?)."
4. It is evident that the two interpretations give different years of birth: if, at the time of the publication of the *Observationes*, Fontana was sixty-one years old, he would be born in around 1585, while, if he was nineteen years old in 1608, he would be born in around 1589. However, both birthdates are consistent with the very little information we have about Fontana's life.
5. On the basis of stylistic considerations, Giovanni Papi (2011: 52) believes that the canvas was painted towards the end of Ribera's Roman period, while Nicola Spinosa (2011: 90) places it in the early Neapolitan period. Ribera moved to Naples in the middle of 1616. Alfonso Pérez Sánchez dates the series of the Five Senses, whose order of creation is unknown, between 1611 and 1615 (Pérez Sánchez and Spinosa, 1992: 60).
6. Naturally, such sizes do not refer to the diameter of the objective lens, but to twice its radius of curvature.
7. Actually, Fontana had already made a 15-palm telescope in March 1637, but this in-

strument turned out to be of rather poor optical quality, since it did "... not define well

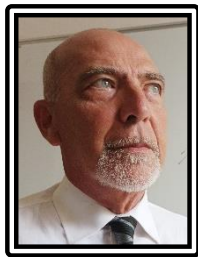
Jupiter's disk, showing it all fluffy." (Magiotti, 1637).

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