

Salvator Mundi.

The discovery of the JUPITER Satellites by Giorgione, Leonardo and Dürer

Abstract: On November 15, 2017 the painting Salvator Mundi ("Savior of the World") attributed to Leonardo at a Christie's auction was sold for the price of \$400 million, the highest price ever paid for a work of art. This paper will argue what constitutes the actual value of the masterpiece. Albrecht Dürer's unfinished Salvator Mundi was created between 1502 and 1504. A thorough check of the painting gave insight that Dürer discovered Jupiter's large moons in the same period of time as Leonardo and Giorgione. Together with the latter he even discovered a third moon: Europa. In the second chapter it is shown how Leonardo's successors took on and modified his work. The copies by Giampietrino, Luini and da Sesto will be analyzed. Leonardo exerted an influence on Carpaccio's Salvator, which considers the possibility of a "moving" earth. The hypothesis that there are four satellites of Jupiter became an irrevocable certainty.

1 The discovery of the Moons of Jupiter

1.1 The observation of Jupiter in October 1501

Giorgione, born 1477 or 1478, created the frieze of Castelfranco between 1502 and 1503. In the astronomical section we find the system of Ptolemy and the Orbit of the Moon taken from Sacrobosco's "Sphaera". Beside these figures is a ruler (Fig. 1).

On the panel with the orbits of the planets - with the Earth in the center - is the symbol of Jupiter (Fig. 2). It appeared at the frontier between Aries and Pisces. Giorgione observed this planet in October 1501.¹

¹ cf. Gloor 2011/2012/2013, p. 56.

On the ruler we find the letters: *p T / v / S / I* (Fig. 3).² We can complete these abbreviations as follows: *punTi / visibilis / Satellites / Iovis* ('Points are visible - the Satellites of Jupiter').³ First, he saw two satellites, later on three (DUE resp. TRE in Fig. 3).

At the end of the frieze one finds a cameo with the letters *IS* (Fig. 4). To Gentili "their meaning is unclear."⁴ The letters, however, are not on their own, but are framed by three points. *IS* may well be an abbreviation for: John de Sacrobosco, whose "Sphaera" Giorgione has taken numerous illustrations. With reference to the Jupiter, *IS* can be described as: *I O V I S* (lat. - Jupiter). Giorgione came across something "special": The pair of points stands for Ganymede and Callisto, while Europa is represented by the isolated point.⁵ The painter may have planned a future work - today known as *The Three Philosophers* - in order to provide his observations with an exact date. For this purpose is the last diagram of the early work - an "empty" plate.

1.2 Leonardo's *Salvator Mundi*⁶

The *Salvator Mundi* motif can be traced back to the Middle Ages.⁷ The crystal ball is perhaps the most striking element in Leonardo's *Salvator* work (Fig. 5).⁸ In contrast to conventional representations of Christ with a globe, the crystal ball is depicted WITHOUT a cross. From an "astronomical" perspective, the three "dots" on the surface are naturally of great interest. Are those really "big stars", as M. Kemp thought most likely, being unaware of all the facts? As direct reaction to the auction it was speculated that those could be stars of the constellation Orion. Indeed, the pattern resembles those stars, surrounding the Orion Belt. But why should Leonardo reproduce a constellation that can be observed very well by the naked eye?

1.2.1 The October of the Year 1501

If the painting is connected to a specific astronomical observation, there should be indications to a period of observation.⁹ Only after tracing back the period when one or more

² See for a first interpretation of these letters Keim 2009, p. 32.

³ This mixture of Latin and volgare (= Italian) was also used by Botticelli in his *Madonna della Melagrana* (cf. Keim 2015).

⁴ Gentili 2004, p. 130.

⁵ cf. Keim 2009, p. 30 ff.

⁶ Leonardo da Vinci (1452-1519).

⁷ J. Trempler mentioned an altarpiece from Westminster Abbey around 1260, on which Christ holds a globe, as the earliest representation of *Salvator Mundi* in painting (cf. Trempler 2011, pp. 78-79). Interestingly, it was during this period that Johannes de Sacrobosco wrote his famous Booklet on the "Sphaera" (cf. Hamel 2014, p. 8) and subsequent.

⁸ The most recent restoration of the *Salvator* was carried out by D. Modestini (New York). Cf. the crystal ball in Renaissance paintings, among others in *Salvator Mundi* representations, Trempler 2011.

⁹ The interest in astronomy and astronomical observations has been supported by the print of the "Sphaera" of Johannes de Sacrobosco. Since its first publication in 1472 in Ferrara and Venice could be proven up to 1500 34 issues, 18 of them in Italy alone (cf. Hamel 2014, p. 73 ff.).

such observations were conducted, it is possible to determine at which "objects" the observations could have been focused at. Firstly, the Salvator's clothing attracts attention with the certain characteristics: the edging at the neck area and the two stoles on the breast (which could perhaps be made of leather).¹⁰ There is a "letter" on top of the border: it is clearly the letter *U* (from Latin *Unus* = I). The *U* denotes experimentally the YEAR NUMBER: the year ONE, that is 1501. A further determination should refer to the month of 1501. The crossing stoles form the letter *X*, which in the Latin numerical system stands for 10. The tenth month of every year is the month OCTOBER. This would mean that both the year and the month of a "possible" series of observations was found: October 1501. Another astronomical phenomenon is given by the MOON PHASE. The moon was illuminated on the left side in early October. This is shown by the sleeve of the left hand pointing upwards. On 4th October 1501 the decreasing moon was documented. It is interesting that the letter *U* "encloses" two stones which virtually form a pair. Another stone or pearl can also be found at the intersection of the stoles. So there are three stones in total.

In October 1501 the planets Saturn, Mars and Jupiter were the ones to dominate in the evening sky. In the eastern hemisphere, Saturn and Mars, at a height of 35 degrees, formed a pair. In the western hemisphere, Jupiter was to be seen at an altitude of 53 degrees (at 22:30 h). It appeared towards SSE and moved increasingly southwards during the month. When you compare this "constellation" with the Salvator, one can make a "surprising" conclusion. As already mentioned, THREE decorative elements are placed on the Salvator's chest: Two stones, one smaller and one larger, are framed by an *U*; another decorates the overlap point of the stoles. This "arrangement" corresponds exactly to the sequence of the planets Saturn, Mars and Jupiter of this month! The stones specified by the *U* correspond to Saturn and Mars. Delimited from this pair, the lower "pearl" represents Jupiter. Leonardo observed three planets in October 1501.¹¹ One might wonder to what "result" he may have come, a result which after all, he must have considered worth communicating. Another thought would be, whether he paid equal attention to ALL planets, or whether he was devoted to ONE. The painting contains a decisive hint in that matter. We can draw a horizontal line connecting the pearl that stands for Jupiter and the three dots. Apparently Jupiter is "connected" with them. "At" Jupiter Leonardo seems to have

¹⁰ On the *Madonna della Melagrana* Botticelli's Mercury wears two stoles, whose cryptic "message" was deciphered by the author on an experimental basis (cf. Keim 2015).

¹¹ It is known that the man from Vinci joined Cesare Borgia in the following year as Military engineer.

come across something "strange": As we know today, the "dots" can only refer to its brightest MOONS.¹²

1.2.2 The first observation of Ganymede and Callisto on October 6, 1501

In fact, the three dots on the crystal ball, which were also marked by the restoration, are puzzling. A nearly horizontal pair of dots can be seen, where the left dot is brighter. Below the right one is another dot, which is clearly applied more intensely.¹³

In order to be able to "discover" the Jupiter moons, some criteria must be met. In addition to optimal visibility, Jupiter should be positioned as close to the Earth as possible. This was the case due to its opposition on 14 October, 1501. On the other hand, it is likely that initially only the outer moons, Ganymede and Callisto were found. In their maximum elongations, both stay in sufficient distance from Jupiter. Ganymede is the brightest moon anyhow. That "Three points"-triangle on the crystal ball is atypical for a single observation of the moons. These moons are often located in pairs to the left or right of the planet; the "third" point south of them causes a problem. This leads us to believe that Leonardo has made TWO or more observations on different days.

The first observation should correspond to the upper pair, a second slightly to the point in the "second" row. The constellation that corresponds to the first pair: Ganymede and Callisto¹⁴ is given on 6 October 1501: <J1> G1 (Ganymede) K1 (Callisto) (Fig. 5). The location is Florence with the length 11° and the width 43°. The planets Mars and Saturn were seen east of Jupiter. The absolute distance Earth-Jupiter was with 3.9 AU optimal for observations (AU = Astronomical Unit). Jupiter himself was at a height of 53° to the south east. Its brightness was -2.7 mag (= magnitude, in the future m). The positions of all four moons were: Io Europa <Jupiter> Ganymede Callisto. Ganymede was 4.4 m, Callisto 5.5 m bright. Such brightness was sufficient for their visibility. The other moons, Io and Europa, were too close to the planet.

1.2.3 Callisto's "Return": October 24, 1501

Another "dot" is applied onto the crystal ball below the pair of dots. Does it stand for another observation of Jupiter on another day, and if so, on which one? If Callisto was meant by this point, it would be Leonardo's intention to represent the orbiting time of this fourth moon:

¹² cf. to the Jupiter moons at Giorgione the resuming writing of the author (Keim 2019). Giorgione's dependence on Leonardo, especially in oil painting, was mentioned by Vasari (Vasari 2002, p. 365). A meeting of the two was possible at the beginning of 1500 in Venice.

¹³ Regarding these points Modestini wrote: "The three large specks of white paint must represent reflections on the surface of the sphere from an outside light source (! F.K.), but since many of the original glazes have perished, even when toned down, they float without context." (Modestini 2014, pp. 146-148).

¹⁴ The names of the mythological figures were given by Marius and Kepler (cf. Keim 2009, pp. 122-123).

Callisto's "Return" took place on 24 October. It stood as the single moon at about 22:30 h south-west in maximum elongation: Ganymede Europa Io <J4> K2 (Callisto); that's precisely the situation depicted in Leonardo's *Salvator Mundi*. This proved that it took 18 days to make ONE rotation around Jupiter (16.8 days in fact).¹⁵ The observation of Leonardo connected to the "isolated" point is thus given on October 24, 1501. The values have slightly changed since 6 October. Jupiter won 2° on height - which was then at 55° - its distance to Earth was slightly higher at 4 AU has grown. Callisto was a little darker at 5.6 m.- Leonardo's Jupiter observations could be put aside at this point, if there were not a visual finding forcing us to reopen the case. The question is whether the mysterious third point is actually only identical to Callisto, the "weak" moon, due to its compactness. Which other moon could correspond to this "concentrated" point? Here follows the solution to this puzzle.

1.2.4 Leonardo's "Supermoon"

The large, white spot is firstly called Callisto. Leonardo wanted to demonstrate, what time this moon took to orbit Jupiter. But not exclusively. Meanwhile Ganymede had completed two laps around Jupiter. At 13 and 21 October, he had returned to the starting position of 6 October, for a rotation took about 7 days. In comparison with G1 (Ganymede on October 6) and K1 (Callisto at the same time) the lower point has approximately a DOUBLE WIDTH.¹⁶ This "doubling" of size can only refer to the two stays of Ganymede on 13 and 21 October! In his portrayal Leonardo "slammed" these two "apparitions" to Callisto's final return on 24 October 1501 (<J2-4> G2/3 K2).

Strictly speaking, to demonstrate the orbiting times of both moons, he would have required 5 points: two additional ones below G1 (Ganymede) and one for K2 (Callisto). Maybe that would have confused the viewer. With its "compressed" display his "Supermoon" thus unites the moons Callisto 1x and Ganymede 2x in each other. Leonardo placed the third point almost below the position that Callisto possessed at October 6. The important aspect was that Ganymede on 13 and 21 October had each reached a "turningpoint" (G2 and G3): The moon had completed TWO laps BEFORE Callisto had completed ONE. In that aspect of their return to the starting point, both moons resembled each other. Leonardo's "superpoint" is indeed unusual, but its setting is understandable for the reasons mentioned.

¹⁵ It cannot be determined exactly which day Leonardo meant here, whether the 23th or 24th of October. If it had been 23 October - which is not assumed here -, the demonstrated calculation with 17 days (instead of the assumed 18) would be even more precise.

¹⁶ The points were measured with 0.6 cm (Ganymede) and 0.7 cm (Callisto) : 1.1 cm (large point), no exact doubling (cf. Christie's 2017, p. 32). The brightness (the amount of white) of the lower point is clearly elevated.

With Callisto's "return" and its union with the "double" Ganymede the observation series of October 1501 had finished.¹⁷

1.2.5 The crystal ball as a condenser lens

It can be assumed that Leonardo saw the "dots" with the help of the crystal ball.¹⁸ In 1509 he explicitly described the construction of a Galilean telescope, which consists of a concave and a convex lens.¹⁹ The crystal ball offers a new way to look at HOW the world can be seen. It shifts "between" the looking subject and its objects. Most of all, it was possible, to enlarge the image of any object, created by a second lens, e. g. a magnifying glass. Without the "application" of an optical construction, the discovery would probably not have been possible. As a result, the hand of Christ that makes a blessing gesture has a different meaning. Fingers point to the vault of the sky, where the new celestial bodies have been found. The painting is also an educational image in this sense. One could perhaps say the "classical" *Salvator Mundi*, that is the Christ connected to the world, has "mutated" into a natural scientist whose new tasks include the reconstruction of God's unfathomable creation. However, Leonardo apparently fails to track down the inner moons, Io and Europa.

1.3 Albrecht Dürer as an astronomer

One assumes today that Dürer's *Salvator Mundi*²⁰ was made before his second trip to Italy (Fig. 6). Dürer, born in Nuremberg in 1471, lived in Venice from 1505 to 1507. The date of origin of the *Salvator* can be assumed to be 1502/04. Looking left, his mouth is slightly open, Christ points to heaven with two fingers. From the above, he seems to mean something to us: "I saw something with my OWN eyes."²¹ Three colours dominate: green, blue and red. Against a green background the man is wrapped in a blue dress and a dark red coat. In his right hand he holds a crystal ball. Dürer played with the colors of the clothes: red and blue, on the ball, not only to reproduce, but to brighten it up. In addition, the angle

¹⁷ The age of discoveries and in its wake also that of cartography started: Leonardo himself designed plans of Imola and the Arno valley. Jacopo de'Barbari, a friend of Dürer, created in 1510 a veduta of Venice (depicted at Camerota 2009, pp. 26-27). The "terrestrial" measurements were gradually joined by those of the sky.

¹⁸ "A glass ball filled with water serves him [Leonardo] as a collecting lens." (Bramly 1993, p. 314). One century later, the painter Adam Elsheimer also used glass balls (so-called "shoemaker's balls") filled with water for telescopic purposes (cf. Keim 2017, pp. 58-59).

¹⁹ cf. Keim 2009, pp. 42-43, with further hints on Leonardo's optical experiments.

²⁰ Now in the Metropolitan Museum of Art (Met), New York.

²¹ Cosmology and astronomy were certainly topics in the Nuremberg of the 15th century. Georg Peurbach's *Theoricae novae planetarum* were first printed there about 1473 by Regiomontan (cf. Hamel 2014, p. 14). With Regiomontan's *Disputatio* both works "together with the 'Sphaera' formed a book which was printed in this compilation very often, especially in Venice, namely 1482, 1485, 1488, 1490, 1491, 1501, 1513 and 1519 [...]" (ibid., p. 14). Dürer could already have found the "Sphaera" during his first stay in Venice.

for the Earth inclination, 23.5° , is incorporated. Might show from reading off the ball what it is, WHAT was recognized above?

One detail deserves special attention. At the top of the sphere stands out a ring, where a piece of jewelry is attached: a blue sapphire set in a gold rim with three light blue agate pearls. The structure is similar to the Jupiter symbol. Thus, only Jupiter with three moons should be meant by this. Dürer's data on the date are rather scarce. On the fingers, which become "one", one can recognize the year 1501. Again, the month can only be October, as Jupiter's opposition falls on this month. Dürer like Leonardo, would have seen Ganymede and Callisto on 6 October 1501. From the positioning of the moons - Callisto is more in the south - indicates that his observation was somewhat later, around midnight. Another detail deserves attention: the third moon, Europa. He could already see it the next day, October 7th: Europa <Jupiter> Io Ganymede Callisto. At constant brightness of the others, Europa was in that night 5.1 m bright. Also its "size", in about half of the large moons, has been handed down ($1''$: $1.8''/1.6''$). On the other hand, a "third" moon cannot be found in Leonardo's *Salvator*.

Due to the various connotations, the Dürer "sphere" has a triple meaning. It is once a crystal ball or a glass ball filled with water, which the ambient colors "brighten up". Thus, it is also suitable as a tool for observations. Secondly, because of the demonstrated Earth's inclination, it stands for the Earth. The third level of meaning has the master from Nuremberg linked up with the Jupiter Orbit: The Dürer sphere represents a model of our solar system and in this sense forms a celestial sphere limited to our system.²² On the one hand the clothes of the *Salvator* are well worked through, but on the other the face, the neck section and his hands have only to see sketches. So, the important painting unfortunately remained unfinished.

The theme of the famous *Feast of the Rose Garlands* of 1506 is on the one hand the crowning of Maria. On the other hand, rosaries are given to the Pope and Emperor and other people present. The roses are of course a sign of Venus. Dürer linked back with it to Botticelli's *Birth of Venus*. All in all, the painting may be considered as an honor paid to Venice that is to be understood as the "City of Venus". Of course, the Jupiter moons are also present in the *Feast of the Rosary*. The Madonna is sitting in front of a green canopy and is crowned by two putti, reminiscent of Botticelli's *Madonna of the Magnificat* (Fig. 7). At the front of the crown is shown a green sapphire with pearls. Significantly there are now

²² With the participation of Johannes Stabius and Konrad Heinfogel, Dürer created an earth globe and star maps in 1515 (depicted at Camerota 2009, pp. 22-23).

FOUR pearls (alias Moons), after Dürer and Giorgione had found all satellites.²³ But that's not all: At the top of the crown the piece of jewellery is reproduced a second time.

2 Cosmic concepts ACCORDING TO Leonardo

2.1 *Giampietrino's Salvator Mundi*

Giampietrino's²⁴ reproduction, although colored differently, looks like a lifelike copy of the original (66 x 48 cm, Fig. 8). Christ's overall posture together with his view from the picture are identical. The same applies to the hand raised as a greeting, including the folds of the sleeve. The crystal ball, on the other hand, is completely black. For the master, it was transparent. It "reinforces" here the darkness of the cloak in front of which it stands out. The painter also played with light: At its edges the sphere reflects penetrating light in different intensities. The structure resembles such a delicate "moon sickle".

The border and the large U are in a light brown. The stoles seem to be not made of leather, but of textile nature. They are decorated with noble, golden lines and ornamental patterns. The X is repeated on the border and both stoles. Of course, Giampietrino wanted to recall the series of observations his model made in October 1501. From Leonardo's "Jupiter stone" he formed a multi-part piece of jewellery. In the middle is a dark stone in a golden ring with four pearls in gold. The arrangement is completed by four winged angel heads, a symbolism, that identifies the pearls as "flying beings". It has to be said that "his" work on the clothes as a whole appears "more modern".

The three decorative elements at the U and at the crossing of the stoles are held in dark colors. A square and an oval stone are separated more clearly than in the archetype: As we know, they represent Saturn and Mars. The third, bluish stone represents another planet. The astronomer identified it as Jupiter by giving it its four moons aside. It has been known in Italy since 1505 at the latest, that Jupiter has four moons. The emblematic form²⁵, where Giampietrino confirms that fact, is also found in Dürer's *Feast of the Rosary*. It can

²³ The problem is that Giorgione has passed down a date - April 14, 1505 - from which the discovery of Io is certain. It is true that on the *Feast of the Rosary* the mentioned pieces of jewelry with the four moons are found. But we don't know WHEN Dürer discovered Io, the innermost moon. This can be done either from one's own experience or by a message from Giorgione happened during his stay in Venice.

²⁴ Giovanni Pietro Rizzoli, 1495?-1549. He is responsible for his copy of the legendary *Last Supper* (c. 1520, Royal Academy London). A standard work on Leonardo and his circle in German was written by Suida in 1929.

²⁵ An "emblem" would mean something like a coagulated form, a "fact". According to the state of knowledge at that time and according to the technical possibilities, Jupiter "had" simply four moons. Giampietrino was focused only on this fact, he was less interested in the concrete observation and knowledge process. He therefore also abstracted from the positions and sizes of the Moons. The mysterious "dots" on the sphere had also been disappeared.

be summed up that the lower pearl already represented Jupiter by the universal scholar. The surrounding pearls resp. the angel heads would stand for its biggest moons.

2.2 *Bernardino Luini's Christ among the Doctors*

An emphatically feminine Christ stands, with a soft, slightly open mouth, in a wrinkled one, red-blue robe in front of us.²⁶ Outstanding his companions, he looks out of the picture. Dressed with violet stoles, the light brown border on the neck area with gems and pearls catches one's attention. Both arms angled, the hands form signs that seem incomprehensible at first. Scribes are standing by his side and behind him who look at each other.

At Luini the border plays an important role. On it you can see three stones: left and right there is a green and a red one - in the form of a parallelogram - in the middle. Between the stones two larger pearls are attached, each framed by four further. This shows that Luini transformed the pattern of the three planets - the previously vertically - into the horizontal. In the course of this, Christ's hands have new functions. The right one points to an oval, green stone, which is used for the planet Saturn. The red stone represents Mars because of its color. The middle finger points to a large, bright pearl. It is Jupiter framed by its moons. Luini has distinguished them in terms of size and brightness. As already mentioned, there are 2 "rectangles" with a total of 10 pearls applied. Maybe they should indicate the different positions of the moons. In the left rectangle Ganymede is clearly the largest and brightest moon. Finally, the middle finger of the right hand forms with the index finger of the left one right angle - the decisive sign for the maximum elongation of all four.

2.2.1 The four doctors

The idea of grouping scribes around Christ opened up further possibilities for the painter. He thus shifted the symbolism of the "pearls" to an additional personal level. It is clear that the four scholars represent the four Jupiter moons (!). But who represents which of the moons? Behind Christ stand the bearded man with an orange headgear and the man with red turban opposite. It is noticeable that the latter - he holds a book like his counterpart - except his head is shaded. The Left wears a dress in fresh green with white sleeve cuffs. Moreover, he shows the number 2. Both occupy a larger space compared to the rear pair. It is the bearded moon Ganymede, and the other Callisto. The head covering of the white-bearded in the background reveals an affinity to the Red of Christ (= of Jupiter). With him the moon Io should be meant. Its counterpart with the green covering would then be

²⁶ C. 1515-1530, 85 x 72 cm, Fig. 9. Bernardino Luini (c. 1480-1532), influenced by Bramantino and later by Leonardo, is considered as a Master of Lombard Renaissance painting.

Europa. That decorative sign of this person shows among other things a crescent moon, a symbolism, which refers to the whole group. Thought-provoking is that the four men are of different sizes. Ganymede is clearly the largest, followed by Callisto. Io and Europa are about the same size. Finally, the directions of the four are revealing. Callisto looks at Io, his colleague at the other end of the scale. Ganymede looks at Europa, who looks - passing Callisto - out of the picture. This glance can be seen as a symbol that there may be other moons "outside" that may have been found in later times. With this idea Luini "transcended" the possibilities of his time. Because of the transposition of the theme to a second level his *Christ* must be as the most important draft according to Leonardo.

2.3 Cesare da Sesto's *Salvator Mundi*

Da Sesto's²⁷ *Salvator* shows, like Giampietrino, a black ball (no picture here). However, the clothing is not very structured, even it makes a poor impression. The U is not recognizable and also the stoles are missing. The face is dipped in a delicate pink, the neck area is white-yellow.²⁸ The crescent moon on the left arm does not appear, as usual in white, but a bluish-green. This color rather arouses associations to a Sea-green more than the Blue of the sky. The forefinger adjusts a contrast to the middle finger. Are there both Ganymede and Callisto meant? With the discreet hint, the painter would have succeeded in reaching the depth of meaning of the *Salvator* without getting too lost in details.

2.4 Vittore Carpaccio's *Salvator*

The *Salvator* of the Venetian painter Vittore Carpaccio is influenced by Leonardo.²⁹ This simple-looking portrait shows an astronomer pointing to the sky.³⁰ In his right hand he holds a glass ball, in the middle of which the Earth is located: a small black one Globe with the oceans. What's remarkable is the way the man that ball holds. Usually, it "rests" on the hand, is "carried" by it to a certain extent. It is not the case with Carpaccio. The nobleman touches it by its side (!), so that if it is a crystal ball, one must be afraid that it could slip away. The painter hinted with this at the possibility that the Earth could be a "moving" Earth instead of a stationary one. With the left hand he points unmistakably to the Sun. The movement of the home planet once granted, the star of the day would nevertheless "hold"

²⁷ 1477-1523, the same generation as Giorgione. From 1505 to 1510 he lived in Milan in the immediate vicinity of Leonardo.

²⁸ The red light reminds us of Mars, the white yellow of Venus or Jupiter.

²⁹ c. 1465-1525. 58 x 46 cm, c. 1510, Fig. 10.

³⁰ In his *St. Augustine in the study* (c. 1502) the Saint wears the features of the Cardinal Bessarion. What is interesting is that the cardinal in this painting looks at a ceiling mounted armillary sphere. Images of the armillary sphere can be found in the Venetian prints of the "Sphaera" Sacrobosco's since 1482 to 1519 (cf. Hamel 2014, p. 34).

it on his course. "Suspicious" are the three buttons on his red cloak, which look like a crescent moon. Two are close to each other, a third is placed further down. Are these the known moons?³¹

³¹ Translated with www.DeepL.com/Translator and with the aid of Ms Kateryna Medvediuk (Augsburg, Germany).

3 Figures



Figure 1: Giorgione, *Fregio delle Arti liberali e meccaniche* (Museo Casa Giorgione, Castelfranco Veneto) (detail)



Figure 2: Giorgione, *Fregio delle Arti liberali e meccaniche* (Museo Casa Giorgione, Castelfranco Veneto) (detail) (additions by the author)

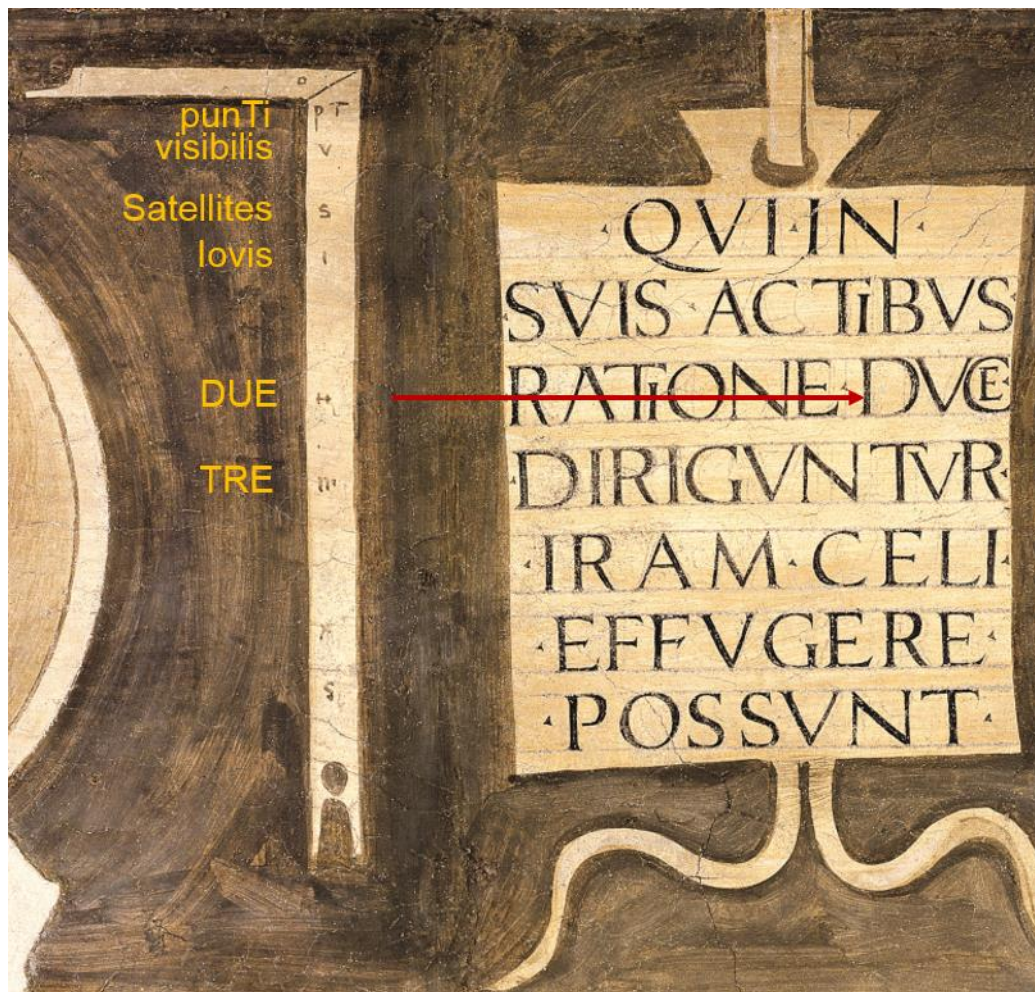


Figure 3: Giorgione, Fregio delle Arti liberali e meccaniche (Museo Casa Giorgione, Castelfranco Veneto) (detail) (additions by the author)



Figure 4: Giorgione, Fregio delle Arti liberali e meccaniche (Museo Casa Giorgione, Castelfranco Veneto) (detail)



Figure 5: Leonardo da Vinci, Salvator Mundi



Figure 6: Albrecht Dürer, Salvator Mundi (additions by the author)



Figure 7: Albrecht Dürer, Feast of the Rose Garlands (detail)

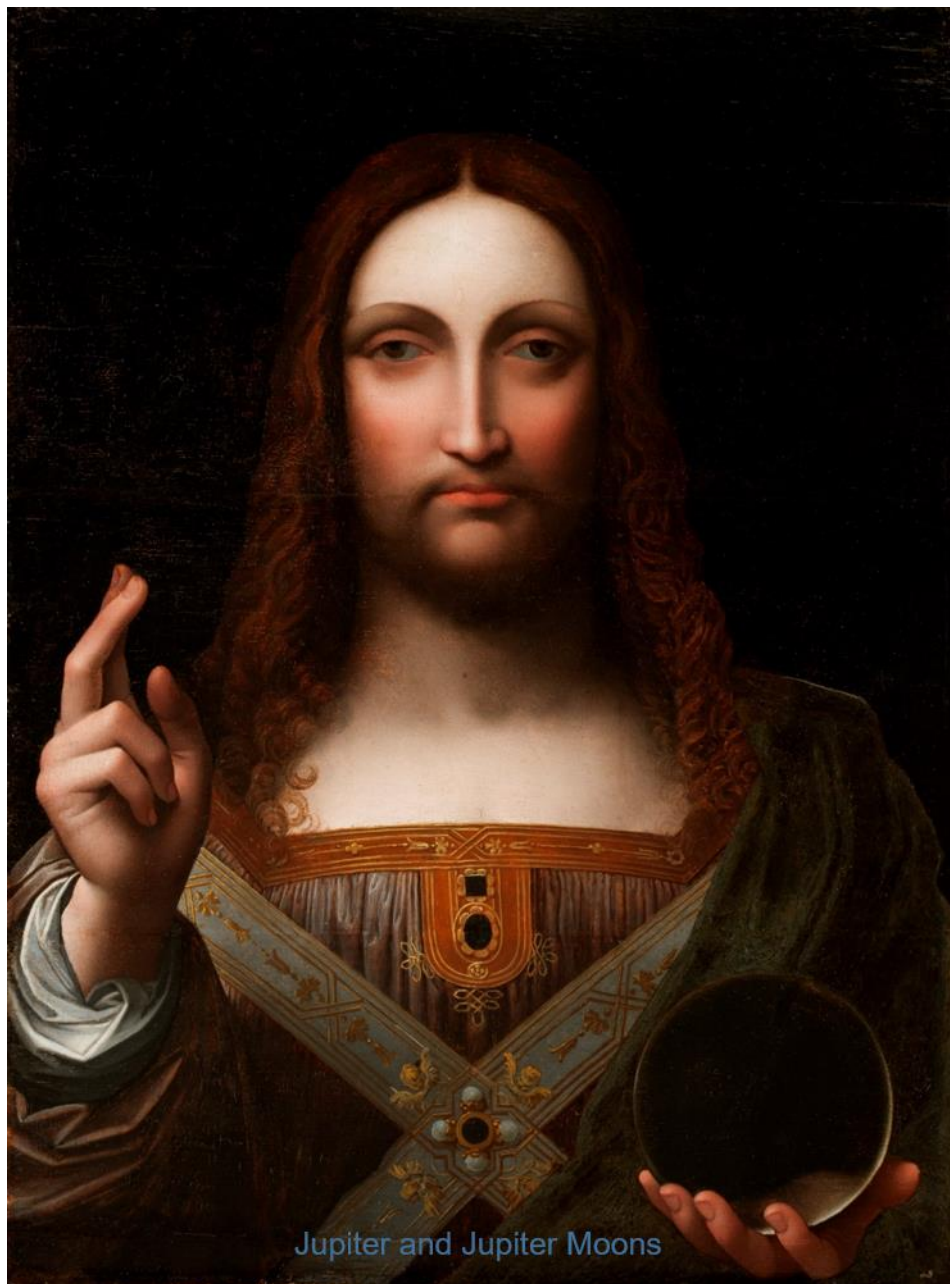


Figure 8: Giampietrino, *Salvator Mundi* (additions by the author)



Figure 9: Bernardino Luini, Christ among the doctors



Figure 10: Vittore Carpaccio, Salvator Mundi

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Figure 1-4:

With permission of the Museo Casa Giorgione (Castelfranco Veneto).

Figure 5:

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Figure 6:

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Figure 7:

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Figure 8:

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Figure 9:

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Figure 10:

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References

- Bramly, Serge (1993). *Leonardo da Vinci : Eine Biographie*. Hamburg: Rowohlt.
- Camerota, Filippo (2009). "Arte e scienza : Da Leonardo a Galileo". In: *Artedossier*, 253.2009, pp. 21–29.
- Gentili, Augusto (2004). "Der Fries von Castelfranco: die große Konjunktion von 1503/04 und der Niedergang der Künste". In: *Giorgione : Mythos und Enigma*. Ed. by Sylvia Ferino-Pagden and Giovanna Nepi Scirè, pp. 125–131.
- Gloor, Balder P. (2011/2012/2013). "Konnte Giorgio da Castelfranco, genannt Giorgione (1478/1479[?]-1510), im Jahr 1505 die Jupiter-Monde sehen?" In: *Jülicher Geschichtsblätter*. Band 79/80/81. Jahrbuch des Jülicher Geschichtsvereins. Ed. by Guido v. Büren, pp. 49–67.
- Hamel, Jürgen (2014). *Studien zur 'Sphaera' des Johannes de Sacrobosco*. Leipzig: AVA Akademische Verlagsanstalt.
- Keim, Frank (2009). *Die Entdeckung der Jupitermonde 105 Jahre vor Galileo Galilei*. Frankfurt am Main [u.a.]: Peter Lang.
- (2015). *Sandro Botticelli : Die astronomischen Werke*. Hamburg: Verlag Dr. Kovač.
- (2017). *Von Botticelli zu Adam Elsheimer : Astronomische Umwälzungen in der Renaissance*. Hamburg: Verlag Dr. Kovač.
- (2019). *Die "Geburtsurkunde" der Neuzeit*. Ulm.
- Modestini, Dianne Dwyer (2014). "The Salvator Mundi by Leonardo da Vinci rediscovered : History, technique and condition". In: *Leonardo da Vinci's Technical Practice : Paintings, Drawings and Influence*. Ed. by Michel Menu, pp. 139–151.
- Snow-Smith, Joanne (1982). *The Salvator Mundi of Leonardo da Vinci*. Seattle: Henry Art Gallery, University of Washington.
- Suida, Wilhelm (1929). *Leonardo und sein Kreis*. München: Bruckmann.
- Trempler, Jörg (2011). „Im Innenraum der Kristallkugel“. In: *Zeitschrift für Ideengeschichte*, 5.2011, pp. 76–93.
- Vasari, Giorgio (2002). *Künstler der Renaissance : Lebensbeschreibungen der ausgezeichneten italienischen Baumeister, Maler und Bildhauer*. Köln: Parkland-Verlag.