

Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

Gianluca Masi and Giangiacomo Gandolfi

Abstract. The lunar phenomena of standstills of the Moon were introduced by Alexander Thom in the 1960s, but fiercely contested by many archaeoastronomers who did not accept their cultural relevance in ancient and indigenous astronomy. Recently the evidence for such lunistics in past cultures and architectures has been positively reappraised, but the discussion is ongoing.

We present a possible case of intentional alignment towards the northern lunistic in one of the most famous city planning projects of the late Italian Renaissance: namely the Sistine Axis, the centre of the new urban arrangement for Rome devised by Sixtus V and his architect and engineer Domenico Fontana (1585–1590). The stretch that connects the obelisks of S. Maria Maggiore and Trinità dei Monti is in fact oriented towards an azimuth of 307° , with an elevation of the horizon of about 1° (the Monte Mario hill, where the Astronomical Observatory of Rome was transferred in the twentieth century), an alignment that transforms the urban ‘canyon’ in a telescopic framing of the Moon at its most northern setting point (taking into account the local horizon). This section of the ancient ‘via Felice’ (from the name of Papa Peretti) is a natural extension of the axis of the famous basilica of Santa Maria Maggiore, a fact that strongly suggests a connection with the original paleochristian church orientation, conceived in order to celebrate the Virgin Mary and her celestial symbol.

On the other hand, the sky and its metaphors were certainly in the mind of Sixtus and of his architect, as shown in a map drawn by the courtier Giovanni Francesco Bordino with the road network around the basilica represented in ‘syderis formam’, in the shape of a star. Furthermore, the lunar theme is reiterated in the Renaissance decorations inside the church, in the famous Ludovico Cardi fresco of the Virgin Mary in the vault of the Pauline Chapel, in which his moon full of craters pays homage to Galileo and to the recent publication of the Sydereus Nuncius. Finally, we provide later iconographic evidence of the connection S. Maria Maggiore-moon cycles from a seventeenth century engraving published by the Dutch engineer Cornelis Meijer, a member of the Accademia Fisico-Matematica led by Giovanni Ciampini.

Gianluca Masi and Giangiacomo Gandolfi, ‘Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill’, *Culture and Cosmos*, Vol. 29 no 1 and 2, Spring/Summer and Autumn/Winter 2025 (Papers from the INSAPXII conference, Corfu, 2024), pp. 111-124.
www.CultureAndCosmos.org

112 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

For the year 2025, peak of the northern lunistice season, the INAF - Astronomical Observatory of Rome and the Virtual Telescope Project plan further investigations *in situ*, promoting a phenomenon that stresses once again the profound bond that has always connected Rome to the sky.

In the following paper we present a possible case of deliberate orientation towards the northern lunistice in one of the most famous urban projects of the late Italian Renaissance: that of Sixtus V and his architect Domenico Fontana in Rome between 1585 and 1590. A few years ago, the Roman archaeoastronomer Flavio Carnevale, having noticed the glow of the summer solstice sunset illuminating the Via Sistina on the horizon, suggested to Giangiacomo Gandolfi that the Sistine Axis (the ancient Via Felice) might be aligned with the setting of the moon during the northern major lunar standstill, and this aroused a long-standing interest on our part.¹ We studied the cultural context, verified the azimuth of the axis (about 307°, with a horizon about 1° high in the direction of Monte Mario), and planned to observe and register the phenomenon from 2023, as the peak season of the lunistics was rapidly approaching. It was not until April 2024 that it was finally possible to verify the phenomenon and obtain some useful photographs, which will be illustrated below.

The correlation of the Eternal City, its streets and ‘focal’ monuments with the celestial bodies is not an unprecedented idea: some scholars have recently proposed an astronomical reading of the most ancient phases of Roman urban planning, based on a close topographical relationship between the city and the sky, symbolic but also morphological, both realised through astral alignments. Interesting examples of these theories are the star-shaped ‘Altera Forma Urbis’ by Giuseppe and Piero Maria Lugli,² the ‘Axis Paliliae’ by Piero Meogrossi,³ and the alignment of the Via Sacra with the sunset of the winter solstice calculated by Adriano Gaspani.⁴

¹ Flavio Carnevale, private communication, 2018.

² Pietro M. Lugli, *L'Agro romano e l'"altera forma" di Roma antica* (Roma: Gangemi, 2006).

³ Piero Meogrossi, ‘I sentieri per il disegno di Roma’, *XY. Studi Sulla Rappresentazione dell'architettura e sull'uso dell'immagine nella Scienza e nell'Arte* 4, no. 8(2020): pp.164–79. <https://doi.org/10.15168/xy.v4i8.154> [accessed 30 Dec. 2024].

⁴ Adriano Gaspani, ‘Il criterio simbolico di orientazione di Roma Antica’, *Paper presented at XXI Congresso Società Italiana di Archeoastronomia, Firenze, 2022*.

The urban scenario of the Campo Marzio, planned by the Emperor Augustus in the first century BC around the Horologium Augusti, with the Pantheon, his Mausoleum and the Ara Pacis, is further evidence of astronomical alignments and of the close link between the rhythm of a celestial body (the Sun) and the city, as recently discussed by Giulio Magli and Robert Hannah⁵ and more widely by Bernard Frischer et al.⁶.

The Sistine Plan and the Stars

Particularly interesting from an astronomical point of view is the first extensive urban plan of the city in modern times, drawn up by Sixtus V, after some timid attempts at reforming the road network by Sixtus IV, Julius II and Pius IV.⁷

Marcello Fagiolo, in a seminal work, studied the evolution of such a Roman general plan on many levels: topographical, allegorical and even astronomical.⁸ The city of Sixtus is, of course, ‘polycentric’ and its axes are conceived as geodesic routes connecting the main basilicas.

In fact, the standard pilgrimage route passed through seven legendary churches – the so-called ‘Sette Basiliche’ – whose importance in the holy capital of Christianity was unquestionable: the route actually offered indulgences if travelled during the Jubilee years.

Sixtus, who was particularly devoted to the Virgin Mary, modified the itinerary, replacing San Sebastiano on the Via Appia with Santa Maria del Popolo, and planned a series of straight and wide roads, ignoring the topography and the differences in altitude. The ideology and the power of allegory were certainly stronger than the topography of Rome, as can be seen from the elaborate descriptions and exaggerated exaltation of Sixtus's

https://www.academia.edu/43267108/Il_criterio_simbolico_di_orientazione_di_Roma_antica [accessed 30 Dec. 2024].

⁵ Giulio Magli and Robert Hannah, ‘The Role of the Sun in the Pantheon’s Design and Meaning’, *Numen* 58 (2011): pp.486–513.

⁶ Bernard Frischer et al., ‘New Light on the Relationship of the Montecitorio Obelisk and the Ara Pacis of Augustus’, *Studies in Digital Heritage* 1, no. 1 (2017): pp. 18–119.

⁷ For a general view of the great architectonic changes of Rome during the Sistine pontificate, see Leros Pittoni and Gabrielle Lautenberg, *ROMA FELIX. La città di Sisto V e Domenico Fontana* (Roma: Viviani Editore, 2002).

⁸ Marcello Fagiolo Dell’Arco, ‘La Roma di Sisto V: le matrici del policentrismo’, *Psicon* 8-9 (1976): pp.24–39.

114 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

works published by his courtiers Giovan Francesco Bordino⁹ and Angelo Rocca.¹⁰

Pope Peretti built his great villa on the Esquilino hill, close to S. Maria Maggiore, his favourite basilica (and where he was eventually buried). The church was chosen as the central hub of a network of streets designed by the architect Domenico Fontana, his faithful town planner. Fontana reinstated the Liberian obelisk in front of the apse of the basilica, among many others. Like many others, it was de-paganised with a cross, decorated with a star and used as one of the symbolic nodes of the network.

Incidentally, the astral nature of Fontana's urban planning was the subject of another bold hypothesis by Fagiolo: he claimed that the pilgrims' itinerary, with the substitution of San Sebastiano-Santa Maria del Popolo and San Paolo-Santa Maria degli Angeli, could have been modelled on the shape of either Ursa Major or Ursa Minor. In the latter case, St Peter would represent the tip of the tail of the constellation and of the urban trail, the true polar star of Christianity¹¹.

The courtiers Angelo Rocca and Giovan Francesco Bordino, in particular, repeatedly emphasised the star shape of the hub, like the cross marked on the ground at the intersection of via Felice and via Pia (today via XX Settembre). At the same time, the papal emblem, modified after the election, contains the star (an araldic comet evoked by the hub?) and the three 'monti', which in this case could be the three hills of Esquilino, Viminale and Quirinale, crossed by via Felice (the so-called Sistine Axis).¹² Is the celestial nature of this urban plan really allegorical? Or is it linked to the heavens by its orientation towards a particular celestial phenomenon?

Whatever the nature of the connection, the straight streets are still visible today, and Via Felice is also an important element of the modern road

⁹ Iohannes Franciscus Bordinus, *De Rebus Praeclare gestis a Sixto V Pont. Max* (1588). The astral metaphors abound in this 'Carmen Elegiacum': the Esquilino hill in particular is '*Syderibusque sacer, Sydus quoque culmine porto*'.

¹⁰ Angelus Roccha, *Bibliotheca Apostolica Vaticana* (1591). It contains the revealing verses: '*Dum rectas ad templa vias sanctissima pandit/ Ipse sibi Sixtus pandit ad astra viam*'.

¹¹ Fagiolo Dell'Arco, 'La Roma di Sisto V: le matrici del policentrismo', pp.24–39.

¹² Pope Peretti, who came from a minor noble family, seems to have added to his original coat-of-arms at the beginning of his pontificate the pears in the hand of the lion (Peretti sounds like 'little pears' in Italian) and the star and the 'trimontio' on the central red band.

network, from Santa Croce to Trinità dei Monti, passing through S. Maria Maggiore and with a planned extension to S. Maria del Popolo.¹³ This last stretch would have been extremely expensive to build in a straight line and was never realised by Sixtus¹⁴.

The Sistine Axis: Location and Specifications

The Sistine Axis in Rome (originally Via Felice, now Via Agostino Depretis, Via delle Quattro Fontane and Via Sistina) runs from the Basilica of Santa Maria Maggiore to Trinità dei Monti. Its ends are marked by the Liberian obelisk (in Santa Maria Maggiore, placed there by Sixtus V in the sixteenth century; it is also called 'Esquilino') and the Sallustian one (in Trinità dei Monti).¹⁵ The main places of interest for this work are shown in the left panel of Figure 1.

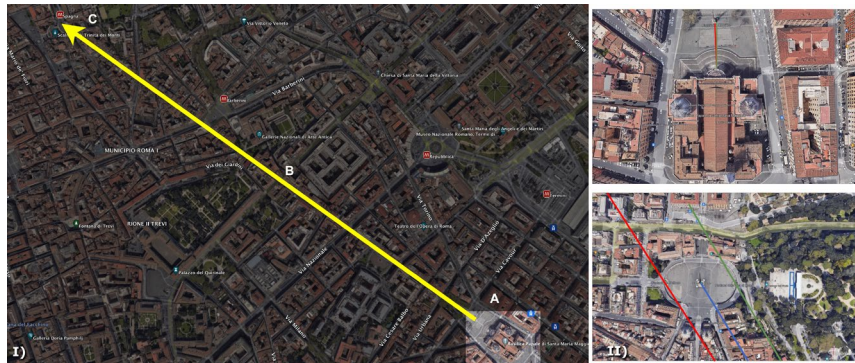


Fig. 1. I) The Sistine Axis (B), running from the Liberian obelisk (A) to the Sallustian one (C), for a total of 1478 meters; II) the orientation of the Sistine Axis (red), the Basilica axis (green) and Santa Maria del Popolo extension (blue). Source: Google Earth.

¹³ Note the symbolic value of the Christological nodes (Santa Croce and Trinità dei Monti) and of the superposed Marian homage (S. Maria Maggiore and S. Maria del Popolo) along the Sistine Axis.

¹⁴ For the events surrounding the extension of the Via Felice and the negotiations with the ambassador of the Grand Duchy of Tuscany for the passage under the Villa Medici, see J.A. Franciscus Orbaan, 'How Pope Sixtus V Lost a Road', *The Town Planning Review* 13, no. 2 (Dec. 1928): pp.121–25.

¹⁵ A comprehensive description of the Sistine obelisks is in Maria Luisa Riccardi, 'Gli obelischi sistini', *Storia architettura*, Ser. NS, Vol. 1 (1992): pp.13-89.

116 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

The Sistine Axis defined above points towards the hill of Monte Mario, from where the ancient Roman Astronomical Observatory (now the seat of the Istituto Nazionale di Astrofisica - INAF) dominates the city. The distance between A and C is 1478 metres (measured with Google Earth). If we consider the Sistine Axis as an ‘architectural telescope’, with the observer placed in A and the ‘objective’ in C, the corresponding field of view (FOV) on the sky is about 0.8° , derived from the angular size of the lunar disc from our imaging sessions reported later in this paper. The Sistine Axis, from A to C, points to an azimuth of 306.9° (source: Google Earth).

It is important to note that the axis of the Basilica, built by Sixtus III in the fifth century, is aligned with the setting of the Moon at the northern major lunar standstill for the latitude of Rome, i.e., at an azimuth of about 310° , the extreme point reached by our satellite on the local north-western horizon. Instead, the Sistine axis connects the Liberian obelisk with the square in front of the church and convent of Trinità dei Monti (belonging to the Order of the Minimi), which was decorated two centuries later with the Sallustian obelisk. The right panel of Figure 1 shows these two directrices (green and red lines), with an indication of the planned extension of the Axis to Santa Maria del Popolo (blue line).

The Lunistice and the Dance of the Moon

A lunar standstill occurs when the Moon reaches its northernmost/southernmost declination during a tropical month.¹⁶ The extreme standstills over 18.6 years, with declinations of $\pm 18.13^\circ$ and $\pm 28.72^\circ$, are called minor and major lunar standstills, respectively. The lunar precession and the inclination of its orbit of about 5° with respect to the ecliptic plane play a key role in this framework.

As a result of this periodic evolution of the orbital plane, the Moon rises and sets outside the solar field at the peak of the cycle. The combination of the Moon's motions and its synodic cycle makes reaching these extremes erratic and very rare.

The azimuth of the setting Moon has its own standstills and reaches its extreme, maximum value around a major lunar standstill, which is clearly of interest for our study, assuming the details of the Santa Maria Maggiore Basilica and the Sistine Axis discussed earlier.

¹⁶ Alexander Thom, *Megalithic Lunar Observatories* (Oxford: Clarendon Press, 1971).

Bradley Schaefer and other archaeoastronomers have strongly contested the lunar standstill phenomenon, denying any use for it and ruling out that any culture systematically observed it.¹⁷ The lunistice would be a complete invention of twentieth century archaeoastronomers, based on sloppy statistics, detached from any anthropological methodology.

A more balanced assessment came from Gonzalez-Garcia and Belmonte,¹⁸ who provided clear evidence of knowledge of lunistics in ancient literature (Ptolemy). They also reported a number of strong archaeological cases of lunar alignments in the context of cultic structures associated with lunar gods and goddesses (stone circles in the British Isles, Supe temples in Peru, Mesopotamian temples in Ur, Egyptian temples in Hermopolis, etc.), concluding that the phenomenon was probably not used for calendrical calculations, but only for religious celebrations.

Moonset on the Sistine Axis

It is now time to take a closer look at the Sistine Axis, its possible connection with the northern lunar eclipse and our attempts to document it with specific imaging sessions.

First, we have calculated (via Nasa/JPL Horizon¹⁹) the lunar setting conditions as seen from the Liberian obelisk (A in Figure 1) from 1 January 2024 to 15 July 2042, covering a full 18.6-year cycle. As the Monte Mario hill is visible in the direction of the Sistine Axis, the real horizon visible through our architectural telescope is placed at about 1° elevation. So only moon sets visible from the real horizon (Alt.>1°, refraction included) were considered. The maximum set azimuth recorded in our calculation was 310.3°, on 24 September 2024. Curiously, the solar tower of the Monte Mario Astronomical Observatory is visible in the field of view of the Sistine Telescope (left panel in Figure 2).

¹⁷ Bradley Schaefer, 'The Utter Failure of the Lunar Standstill Myth in Archaeoastronomy'. paper presented at the joint *10th Meeting of the Inspiration of Astronomical Phenomena (INSAP X)*, *11th Oxford Symposium of Archaeoastronomy and Ethnoastronomy (Oxford XI)* and *25th Annual Meeting of the European Society for Astronomy in Culture (SEAC XXV)*, Santiago de Compostela, Spain, 18th–22nd September 2017.

¹⁸ César González-García and Juan Antonio Belmonte, 'Lunar standstills or lunistics, reality or myth?', *Journal of Skyscape Archaeology* 5, no. 2 (2019): pp.177–190.

¹⁹ Jet Propulsion Laboratory 'Ephemeris calculator', <https://ssd.jpl.nasa.gov> [accessed 30 Dec. 2024].

118 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

During this 18.6-year period, the Moon set 6541 times and was visible through the Sistine Telescope only 153 times (about 2%). Approximately 50% of these times the tracked alignment occurred during the day and was difficult to observe. The results of our simulation are shown in Figure 3.

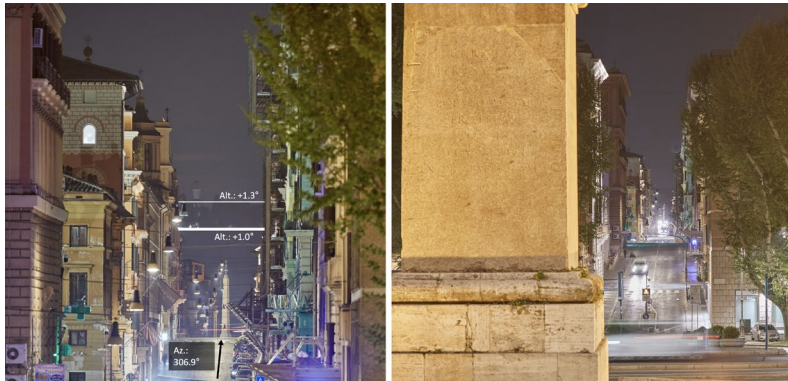


Fig. 2. Left: the view through the Sistine Axis. Right: a view stretching from the base of the Liberian obelisk to the Sallustian one.

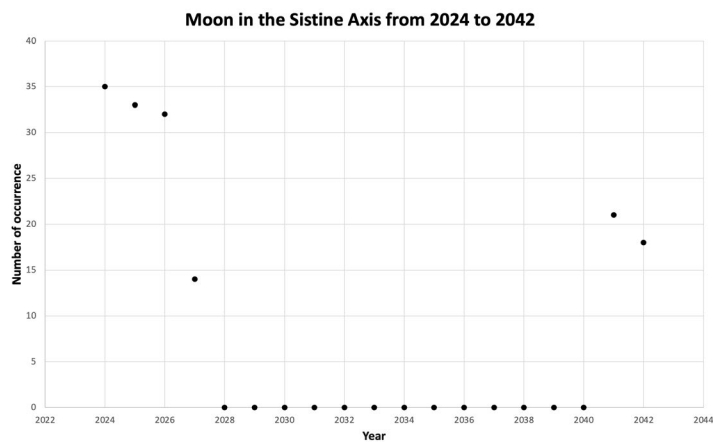


Fig. 3. Results of the 1 January 2024 to 15 July 2042 simulation, showing how many times each year the moonset is visible through the Sistine telescope.

We can see that the moonsets at the northern major standstill along the ‘road canyon’ are visible for about 5 years of the cycle. The pattern is

complex and modulated by the synodic cycle: at the beginning, the moonset reaches the azimuth of the Sistine Axis very rarely and at different phases, then in the three central years the Moon enters the ‘Sistine Telescope’ more regularly.

The phenomenon repeats every month, starting in December, when our satellite sets around the full moon at sunrise, and continues through all the waxing phases of the next lunations, slowly anticipating the timing of the appearances. In May there is a final opportunity to observe the lunar setting with a thin crescent, then the season of daytime appearances begins.

Since December 2023 we have tried for months to take photographs, but without success. The season was awful due to bad weather conditions and stationary clouds near the horizon. We finally succeeded in April 2024, when we were blessed with a few clear nights.

The Images

On the 12th and 13th of April 2024, we had two very productive imaging sessions to document and record the alignment of the setting Moon around its northern major standstill with the Sistine Axis. Details of the Moon at the time of imaging and the setup used are below:

- 12 April 2024

Moonset: 22h 42m, at Az. = 307.6° (source: Horizon/JPL)

Moon phase: 22%

Declination at moonset (geocentric, J2000.0): +27°43.1'

Exposure time: 1.6 s

- 13 April 2024

Moonset: 23:h 45m, at Az. = 308.9° (source: Horizon/JPL)

Moon phase: 31.6%

Declination at moonset (geocentric, J2000.0): +28°34.1'

Exposure time: 1 s

Camera: Canon 5DmIV; Lens: 400mm-f/5.6.

dates/times are UTC; refraction was not considered.

In accordance with Figure 1, left panel, we chose to take the images next to the Liberian obelisk, with a 2m offset towards the NE direction. Figure 2, right panel, was taken exactly from there, with the base of the Liberian obelisk on the left and the Sallustian one barely visible at the end of the Sistine Axis.

120 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

Figure 4, panel a), shows the lunar crescent entering the field of view of the ‘Sistine Telescope’ behind the Solar Tower of Monte Mario on 12 April 2024 at 22:33:44 UTC: the Moon was 1.2° (1.5° including atmospheric refraction) above the horizon.

At 22:36:01 UTC the Moon set behind the hill of Monte Mario (Figure 4, panel b), perfectly on the axis of the Sistine Telescope (elevation of the Moon: 0.8° ; refraction: 1.2°).

The next day, 13 Apr 2024 at 23:30:42 UTC, our satellite was at a higher declination and offered a completely different view, as documented by Figure 4, panel c. The Moon was at an elevation of 1.9° (2.2° taking into account the atmospheric refraction).



Fig. 4. Images of the Moon inside the field of view of the Sistine telescope: April 2024 (a, b, c) and December 2024 (d).

On 15 December 2024, we had the opportunity to observe again the full Moon in the field of view of the Sistine Telescope (the highest full Moon in the northern sky from 2007 to 2042, checked with the JPL Ephemeris calculator), capturing a stunning image that took advantage of the morning

twilight and made the urban features much more visible (Figure 4, panel d).

We have thus demonstrated the existence of the alignment and the visibility of the telescopic effect along the Sistine Axis, around the time of the northern major lunar standstill.

Cultural evidence of intentional alignment

Is it possible to prove beyond doubt the intentionality of such an outstanding lunar orientation? The answer is probably no: the probability of an accidental alignment (1 in 360) is still considerable, and no written sources have yet been found of ecclesiastical prescriptions for the astronomical orientation of buildings or architectural structures towards the Moon along the horizon. The only criterion discussed in ancient and medieval literature is the solar one, the so-called ‘Sol Aequinoctialis’ (the East-West orientation), prescribed for the prayer by the *Apostolic Constitutions* (II.57) in the fourth century by Clement of Alexandria in his *Stromata* (VII) of the second century, and later with reference to the axis of the church by Jean Belet, *Rationale divinatorum officiorum* (II, *De loco*) in the twelfth century, and Charles Borromeo, *Instructionum fabricae et suppellectiliis ecclesiasticae* (X) in the sixteenth century. However, the rules of construction and symbolic orientations were most likely transmitted orally by architects and masons.²⁰ As such, the cultural context can make a significant difference in assessing the credibility of a lunar orientation.

In fact, some scholars of medieval archaeoastronomy insist that churches, especially Marian cathedrals, are occasionally but meaningfully oriented to the rising or setting of the moon at lunistics,²¹ due to the well-

²⁰ For an updated survey of churches orientations in Italy and Switzerland and a general treatment of solar and lunar alignments in sacred Christian buildings of the Middle Age, see Eva Spinazzé, *La luce nell'architettura sacra del X-XII secolo dalla Romandia alla Toscana. Testimonianze sull'influsso dell'osservazione del cielo nell'orientazione degli edifici* (Venezia: IUAV Cà Foscari, Tesi di Dottorato, 2015). <http://dspace.unive.it/handle/10579/6515> [accessed 30 Dec. 2024].

²¹ Some examples of these alignments are provided in A. Caterina Sparavigna, ‘Il Sole, la Luna e la Chiesa di Santa Maria di Vezzolano’, *PHILICA*, ISSN 1751-3030 (2017); Spinazzé, *La luce nell'architettura sacra del X-XII secolo dalla Romandia alla Toscana*; Adriano Gaspani, ‘San Tomé in Lemine: Astronomia, Geometria Sacra e Simbolismo Cosmico’, <http://www.terraarobica.net/Articoli/Archeologia/SanTomein%20Lemine.pdf> [accessed 30 Dec. 2024].

122 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

known allegorical connection between the Virgin Mary and the Earth's satellite.²² The lunistitial directions were geometrically constructed on the ground together with the solstitial ones, using octagons or decagons.²³

The basilica of S. Maria Maggiore is another interesting case of correspondence between theological content and architectural orientation: its apse, as already mentioned, has been oriented towards the local northern major lunar standstill at 310° since the foundation and dedication of the church to the Virgin under Sixtus III²⁴. On the other hand, in order to visually understand the longstanding close theological link between the Virgin and the Moon, it is enough to enter the Pauline Chapel inside the Basilica and admire on its dome the fresco of the Immaculate Conception by Ludovico Cardi, also known as Cigoli, a close friend of Galileo, with its famous telescopic view of our satellite.

But there is more: a century after Sixtus V and Fontana, the Basilica and the Liberian Obelisk were still explicitly linked to the movements of the Moon.

The Dutch engineer Cornelis Meijer,²⁵ a member of the Roman 'Accademia Fisico-Matematica', an academy probably inspired by Christina of Sweden and led by Giovanni Giustino Ciampini,²⁶ published in 1683 a collection of architectural, technical and scientific mirabilia for

²² In Spinazzé, *La luce nell'architettura sacra del X-XII secolo dalla Romandia alla Toscana*, chapter 3.11, there is an interesting discussion on the lunar alignments and on the theological link between the Virgin and the Moon.

²³ Adriano Gaspani and Tiziana Mancinelli, *Astronomia e Architettura Sacra a Viterbo* (Viterbo: Intermedia Edizioni, 2016), pp. 44-57.

²⁴ Despite the legends of a Liberian foundation, the oldest structures excavated in the Basilica date from the first third of the V century. See Eva Margareta Steinby, 'Le tegole antiche di Santa Maria Maggiore', *Atti della Pontificia Accademia Romana di archeologia. Rendiconti*, (1973): pp.101-133.

²⁵ A nice review of the career of this clever technician and of his stay in Rome may be found in K. Van Berkel, 'Cornelius Meijer inventor et fecit. On the Representation of Science in Late Seventeenth-Century Rome', in P. Smith and P. Findlen, eds., *Merchants and Marvels. Commerce, Science, and Art in Early Modern Europe* (New York, London: 2002), pp. 277-294.

²⁶ A comprehensive overview of this Accademia was provided by Salvatore, Rotta, 'L'accademia fisico-matematica Ciampiniana: un'iniziativa di Cristina', in Tina Bovi and Wilma Di Palma, eds, *Cristina di Svezia. Scienza ed alchimia nella Roma barocca* (Bari: Dedalo, 1990): pp.99-186.

the city of Rome,²⁷ including some projects for transforming famous squares into celestial instruments and large sundials.²⁸



Fig. 5. Cornelis Meijer. The Liberian obelisk as a moondial. 1696. From *L'arte di restituire a Roma la tralasciata navigatione del suo Tevere*.

As can be seen from figure 5,²⁹ and as is explicitly explained in the short section devoted to the project for Piazza Esquilino,³⁰ the 'guglia' (obelisk)

²⁷ The book is titled *L'arte di restituire a Roma la tralasciata navigatione del suo Tevere* and was reissued many times during the following decade.

²⁸ They are briefly described in the sections *Figura XI-XV* and include astronomical pavings and gnomonic instruments for St Peter Square, Colonna square, Piazza del Popolo, etc.

²⁹ The engraving reproduced here is extracted from the edition of 1696.

³⁰ The section is titled '*Dell'ornamento che si potrebbe fare attorno la guglia di S. Maria Maggiore*' ('About the ornament which could be made around the obelisk of S. Maria Maggiore'). The text is particularly revealing: '*Per ornare dunque maggiormente la suddetta piazza, potrebbesi, sopra il piano attorno la medesima Guglia, descrivere in un pavimento di diversificati marmi il corso della Luna & in che tempi dell'anno & giorni de li mesi avvengono li Plenilunij, li quarti & ogni altra mutatione simile, conforme si suppone additare con la sopra espressa pianta, il ce quando fusse eseguito servirebbe molto alli studiosi per confrontare da questi segni fissi se doppo alcuni anni fusse accaduta qualche variatione*'.

124 Santa Maria (del Lunistizio) Maggiore: the Roman Sistine Axis and the Major Lunar Standstill

of S. Maria Maggiore was used specifically to trace the movements and phases of the Moon. The engraving seems to be a further strong confirmation of the link between the Basilica and the Moon, but probably also an indication of a more specific awareness of the Sistine Axis as a lunistitial project.

Conclusions

S. Maria Maggiore seems to have been oriented towards the northern lunar Major Standstill since the time of Sixtus III (432–440), when the official dedication to the Virgin was established. Sixtus V and Domenico Fontana may have managed to maintain the approximate lunistitial orientation, connecting the Basilica and S. Maria del Popolo to the Sistine Axis, the northern start of the standard pilgrimage route in Rome. There was certainly an attempt to take into account other factors: 1) the position of the Convent of Trinità dei Monti, a severe obstruction on the line of view, and 2) the alignment with S. Croce to the East on the opposite side. In the end, the urban plan took into account all the constraints, creating an allegorical star on the ground and at the same time an architectural window that could show the moon setting at lunistice for a very limited number of nights every 18.6 years, the period of the revolution of the nodes. We photographed the phenomenon in 2024 and proposed in this paper that there is credible cultural evidence that this operation was deliberate and well-founded on a theological level, reflecting the ancient symbolic link between the Virgin Mary and the Moon, reiterated and reinforced by the texts of many Church Fathers and by the ancient custom of aligning the sacred buildings of Christianity to astronomically significant azimuths. The Sistine Plan transformed the Basilica and the ‘stellar’ hub of its road network, materialised by the Liberian Obelisk, into the dial of a giant lunar clock, whose northern extreme marked the exceptional time of the Lunistice, which peaked in the current cycle around the year 2025. The Baroque Dutch engineer Cornelis Meijer seems to have hinted at this hidden astral configuration in his book printed in Rome in 1683, leaving a trace of his knowledge (or intuition) in the form of an elegant engraving.