

GALILEO'S DRAWINGS OF THE MOON'S IRREGULAR SURFACE

GALILEO OBSERVED THE MOUNTAINS AND CRATERS OF THE MOON

He started observing the moon sometime in November of 1609 and studied it during the first half of December - its surface was irregular. There were mountains and craters on it, like earth. He knew the moon shined by reflected light from the sun. This seemed to demolish the natural philosophy of over 1500 years of Aristotelian thought, that the heavens, unlike the earth were pure and incorruptible. Heavenly bodies were, according to Aristotle and Church teaching, perfectly smooth and spherical. This was a very big discovery.

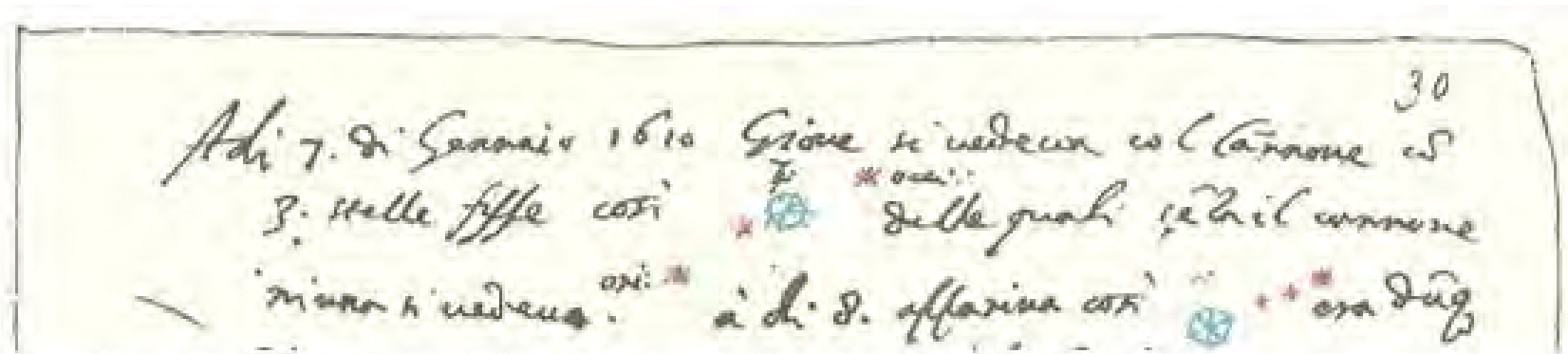


In third place, I have observed the essence or substance of the MILKY WAY circle. By the aid of a telescope anyone may behold this in a manner which so distinctly appeals to the senses that all the disputes which have tormented philosophers through so many ages are exploded at once by the unquestionable evidence of our eyes, and we are freed from wordy disputes upon this subject, for the GALAXY is nothing else but a mass of innumerable stars

GALILEO OBSERVED THE PLEIADES, ORION, THE MILKY WAY

Galileo observed Orion, the Milky way and the Pleiades and discovered innumerable fixed stars never before seen. In the Pleiades (the 7 Sisters) 40 more stars were discovered. This was a problem. The Apocalypse of John talks of 7 churches, 7 candlesticks, 7 trumpets, 7 bowls, 7 seals and 7 stars. The 7 stars are the angels of the 7 churches. To my mind this is the first discovery that conflicted with the religion. The irregular surface of the moon conflicted with Aristotelian physics which was later incorporated into catholicism.

A PORTION OF GALILEO'S NOTES- JUPITER'S SATELLITES



OPERE GALILEO GALILEI p 437 Vol 3 Part 2

On the 7th of January 1610 Jupiter was seen in my telescope with 3 fixed stars thus: east **O* west. These were invisible without the telescope. On the 8th they appeared thus: O***.

It continues: "From this it appears there are 3 wandering stars around Jupiter, previously invisible to everyone."

"Day 7 of January 1610 Jupiter was seen with (my) cannon 3 stars fixed (as) so..."

My clumsy attempt at a translation made me realize how incredibly difficult it is for a historian of science to translate a document which is 400 years old, in another language and hastily written. Three 'wandering stars', i.e. 'planets', actually moons or satellites of Jupiter.

Observations of Jupiter
(1610)

2 ^d Jan. 12	○ * *
3 ^d Jan. 13	* * ○ *
2 ^d Feb.	○ * * *
3 ^d March	○ * *
3 ^d April	* ○ *
7 ^d May	* ○ * *
6 ^d June	* * ○ *
8 ^d June 17	* * * ○
10 ^d June	* * * ○ *
11 ^d	* * ○ *
12 ^d June 24	* ○ *
17 ^d June	* * ○ *
14 ^d June	* * * ○ *

As we see from the diagram, initially Galileo on the 7th of January saw three moons; by the 13th he saw four. By most counts, now Jupiter has between 80 and 95 moons plus rings and asteroids.

When I was a boy the books said twelve.

Galileo's discovery is another nail on the coffin of the Aristotle's Universe, not everything revolves around the earth. This was one argument against the Copernican system. Why should the earth be the only planet to have a moon? Now that argument did not hold water. Galileo's last observation was on March 2; so his observations lasted less than four months.

<https://theastroventure.com/encyclopedia/unit2/JupiterMoons.html>

GALILEO OBSERVED THE MOONS OF JUPITER

48

SIDEREAL MESSENGER

unfolding great and very wonderful sights and displaying to the gaze of everyone, but especially philosophers and astronomers, the things that were observed by

GALILEO GALILEI,

Florentine patrician and public mathematician of the University of Padua, with the help of a spyglass lately devised by him,

about **the face of the Moon, countless fixed stars,**

the Milky Way, nebulous stars,

but especially about

four planets

flying around the star of Jupiter at unequal intervals

and periods with wonderful swiftness;

which, unknown by anyone until this day,

the first author detected recently

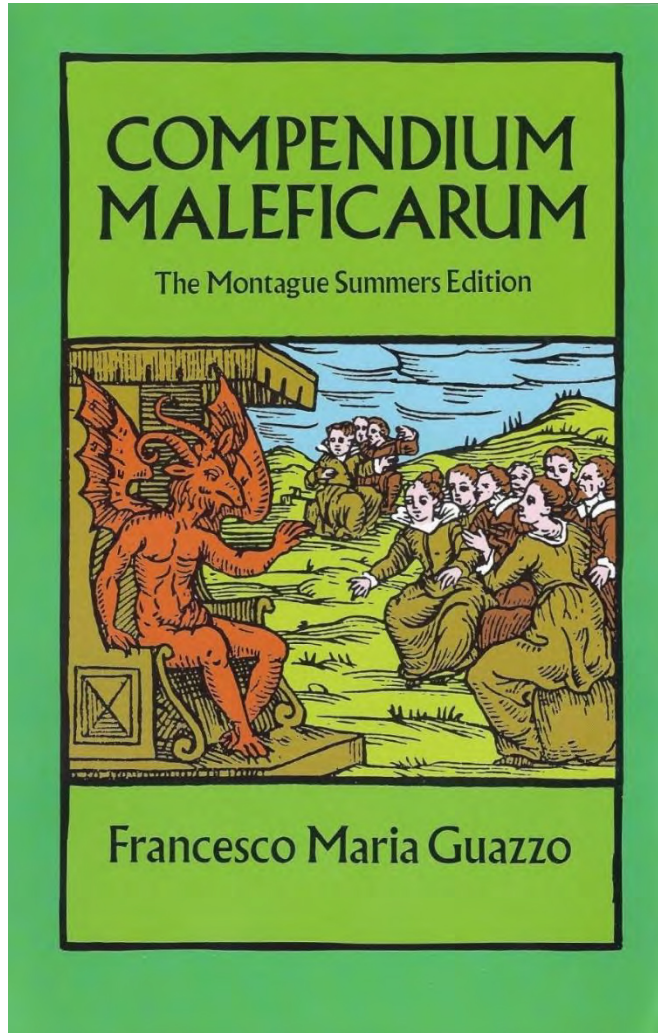
and decided to name

MEDICEAN STARS



SIDEREUS NUNCIUS, (STARRY MESSENGER) was dedicated to Cosimo II de Medici, the Grand Duke of Tuscany, and, as we have seen, he named the moons of Jupiter, the Medicean stars. In September 1610, Galileo was named philosopher and mathematician to the grand duke's court in Florence. Galileo was now a courtier. On March 13, 1610, 550 copies were sold out almost immediately.

A remarkable tour de force; from his very first observations of the moon to the publication of an earth shaking book in about four months, Galileo Galilei began to change the course of mankind.



MILAN- 1608

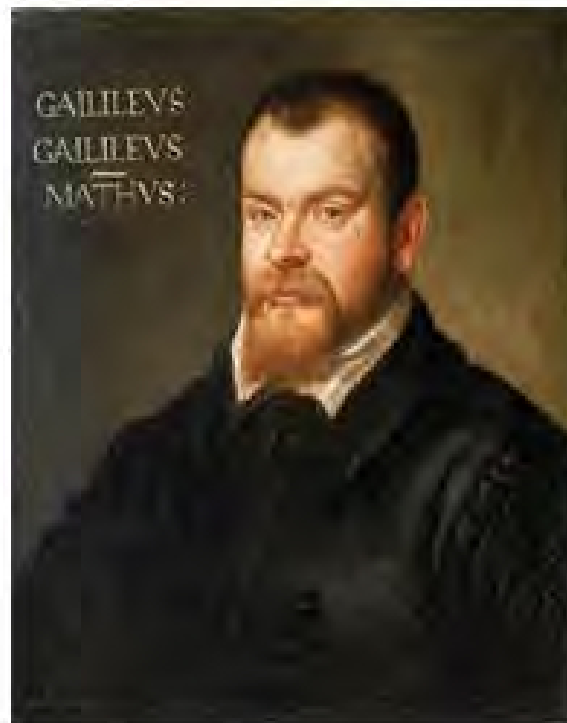


The *Compendium Maleficarum* (a *Compendium of Witches*) is a witch-hunter's manual written in Latin. Galileo's *Sidereal Messenger* was published just two years later. In the Inquisitional manual, *the Sacro Arsenale* published first in 1621 in addition to heretics, the Holy Office could prosecute witches and others. So, we can see the polar opposites of the medieval and the modern appearing at about the same time.



COSIMO II DE' MEDICI

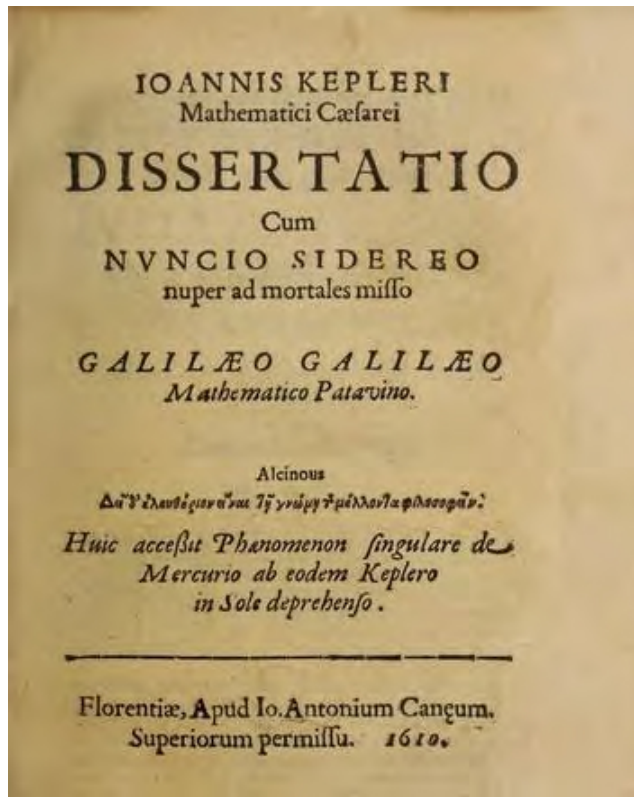
Grand Duke Tuscany 1609-1621



GALILEO

**"first philosopher and mathematician"
to the grand duke of Tuscany**

During the Renaissance most works of fine art were commissioned and paid for by rulers, powerful families, religious and civic institutions etc. The system of patronage in 16th and early 17th-century astronomy was similar. These relations allowed for the likes of Galileo to hold positions under such powerful people as the Medici family, granting him an increase in social status.



https://archive.org/details/bub_gb_jBSq5Bx_NekC/mode/1up

DISSERTATION WITH THE STARRY MESSENGER RECENTLY SENT TO MORTALS

Conversation with the Sidereal Messenger was Kepler's immediate response to Galileo's discoveries. He unintentionally supplied a powerful weapon to the enemies of Galileo. Why? Florio's 1598 Italian-English dictionary: 'Nunti, Nuncio, an ambassador or bringer of tidings or of newes.' 1611 edition: 'Nuntio, a bringer of tidings, an Embassadour'. So, was Galileo thinking of himself as an angel or prophet of some kind? Heresy!!

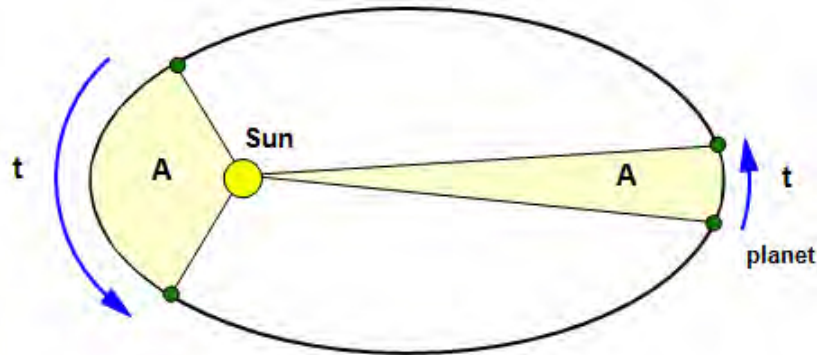


https://en.wikipedia.org/wiki/Johannes_Kepler

JOHANNES KEPLER

1571-1630

KEPLER: 1ST AND 2ND LAWS

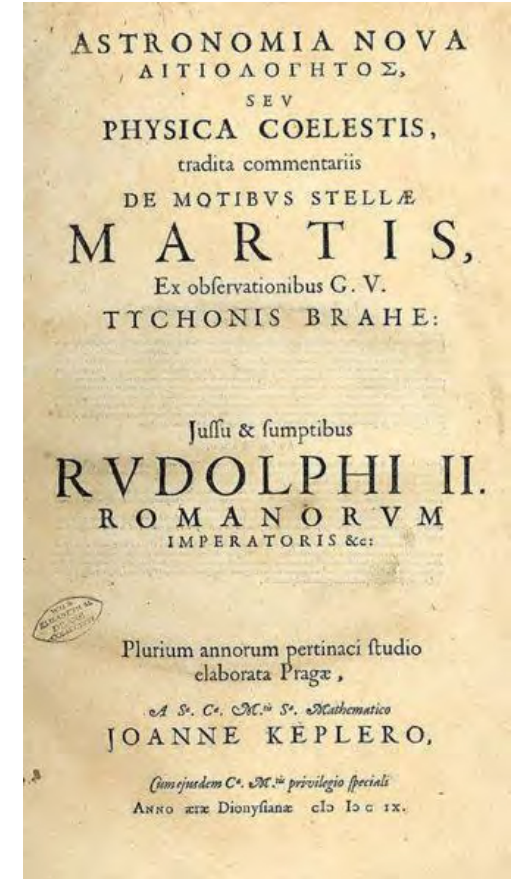


https://www.schoolphysics.co.uk/age1619/Mechanics/Gravitation/text/Kepler%2527s_laws/index.html

1. The planets move in orbits that are ellipses with the Sun at one focus.
2. A line drawn from the planet to the Sun sweeps out equal areas in equal times.

Published in 1609, the *Astronomia Nova* contains the results of Kepler's ten-year-long investigation of the motion of Mars. It is recognized as one of the most important works of the Scientific Revolution. It provided strong arguments for heliocentrism and contributed valuable insight into the movement of the planets, including the first mention of their elliptical paths.

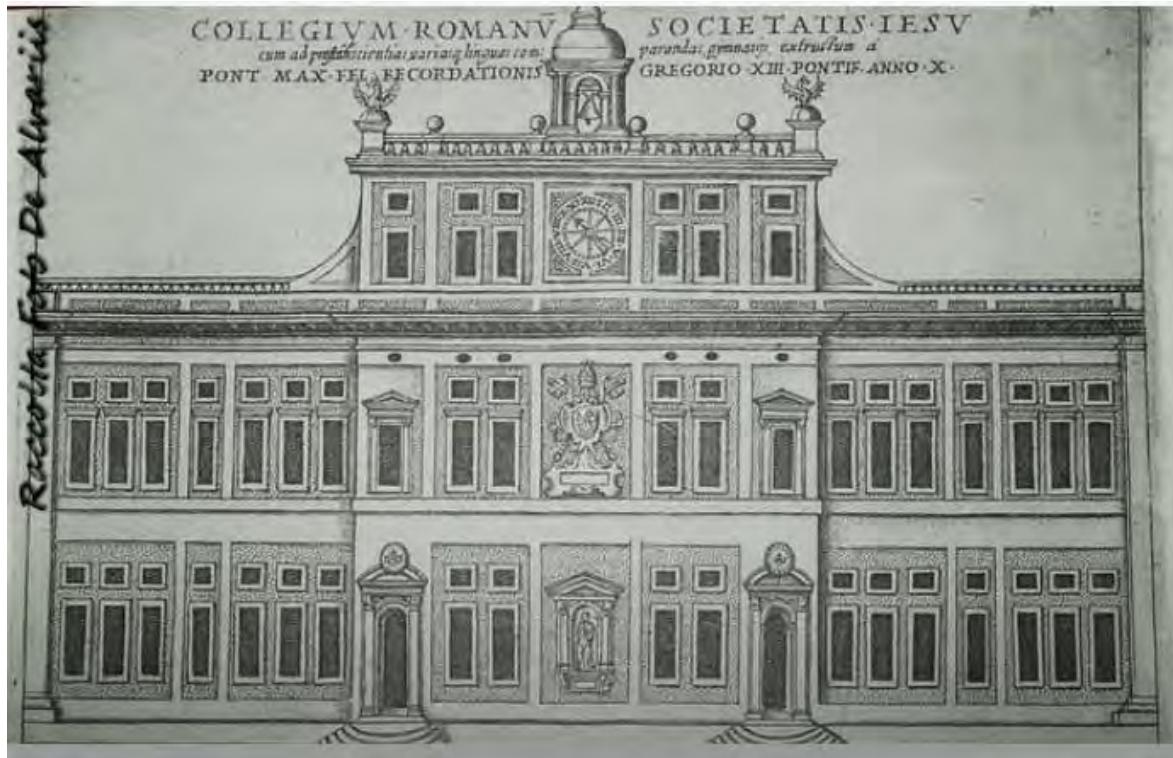
"I have found a cartful of dung." thus Kepler said. Why would he say that? The current belief for religious people (including Kepler and Galileo) - God being perfect would only make the orbits of the planets circles, the perfect geometric figure.



<https://www.maa.org/publications/periodicals/convergence/johannes-keplers-astronomia-nova>

ASTRONOMIA NOVA
JOHANNES KEPLER

1609




<https://www.flickr.com/photos/dealvariis/albums/72157620544691355/>

COLLEGIO ROMANO

c. 1582; HOME OF THE JESUITS

The Jesuits were the intelligentsia of the Church; by 1615 they had 300 colleges in neighboring countries.




 Ego Galileus Galileus Lynceus Vinctus filius
 Florentinus etatis meae an. 111. Sal. 1611 die 25
 April: Romae manu propria scripsi.



PRINCE FEDERICO CESI
 GALILEO BECOMES A LINCEAN IN 1611

Cesi founded the Academy of the Lynxes in 1603 when he was only eighteen. Galileo was inducted in 1611. The Academy published two of Galileo's books, the *Sunspot Letters* and *the Assayer*. The lynx is supposed to have a high level of visual acuity.

Aug. 26, 2013

GALILEO GALILEI LINCEI

FIRST PHILOSOPHER & MATHEMATICIAN

the '**ACADEMY OF THE LYNXES**'

DENSITY OF OBJECT

LODOVICO DELLE COLOMBE

ARISTOTELIAN PHILOSOPHER:

the '**PIGEON LEAGUE**'

SHAPE OF OBJECT

Delle Colombe took Aristotle's view that objects float or sink because of their shape while Galileo took Archimedes' opinion that it depends on the density of the objects.

Delle Colombe was the first to use scripture against Galileo. He was head of the Pigeon League, an anti Galileist group. But 'colómbo' in Italian meant a dove or a pigeon. In Italian 'pipióne, a dove or a pigeon' satirically meant 'bird brain'.



<https://www.thehistoryofart.org/caravaggio/portrait-of-maffeo-barberini/>

CARDINAL MAFFEO BARBERINI

CARAVAGGIO C. 1598

Pope Paul V appointed **MAFFEO BARBERINI** cardinal in 1606 and in 1623 he became **POPE URBAN VIII**.

He was an admirer of Galileo; some scholars say that they were friends, but I don't know to what extent. In a letter he wrote to Galileo in October 1611 he signed it, 'Your affectionate brother, Cardinal Barberini.' This was extremely unusual for a cardinal.

He sided with Galileo on the debate of objects floating or sinking in water. He also wrote a poem 'Dangerous Adulation' that honored Galileo,



CIGOLI -1611



MURILLO- 1660

CIGOLI'S IMMACOLATA AND GALILEO'S MOON

Cigoli, a famous artist, honored his friend Galileo by painting a fresco in the Pauline Chapel depicting Mary over a cratered moon. The moon during the Renaissance was a symbol of purity. The Virgin Mary was often portrayed in paintings of that era atop a perfectly smooth moon as in Murillo's 'Immaculate Conception'. The Pauline fresco could no longer be The "Immaculate" Conception, the Vatican named it 'Assumption of the Virgin'.

**ARISTOTLE**

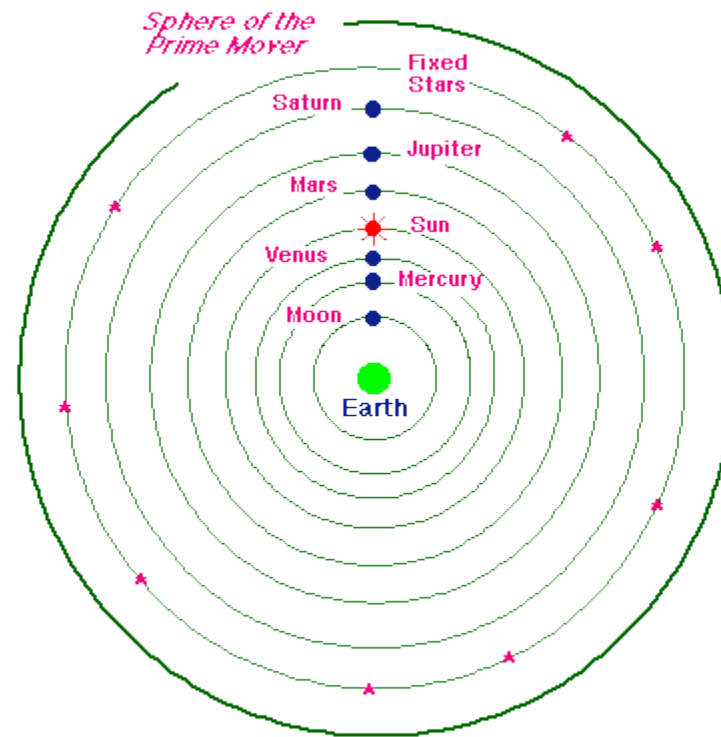
384- 322 BC

**PTOLEMY**

90 -168 A.D.

The Aristotelian-Ptolemaic Universe is a misnomer. Aristotle's cosmology with its nested giant crystalline spheres for each planet, ponderously turning around once a day was inadequate to explain the observations of the planets. Each planet was 'attached' to one sphere turning once in 24 hours and another sphere turning more slowly, to do one turn in a year.* Galileo thought that this cumbersome system was so complicated; instead of all these giant spheres rotating, wouldn't it be simpler if the earth was rotating once a day- similarly for the year?

*Actually there were (at first) a total of 27 spheres. The astronomer Eudoxus was behind Aristotle's conception. There were three each for the Sun and the Moon, four for each of the other five planets and one for the fixed stars. [Fantoli, p 375]. Galileo, like modern physicists stressed simplicity. Isn't it simpler if just the earth is rotating?

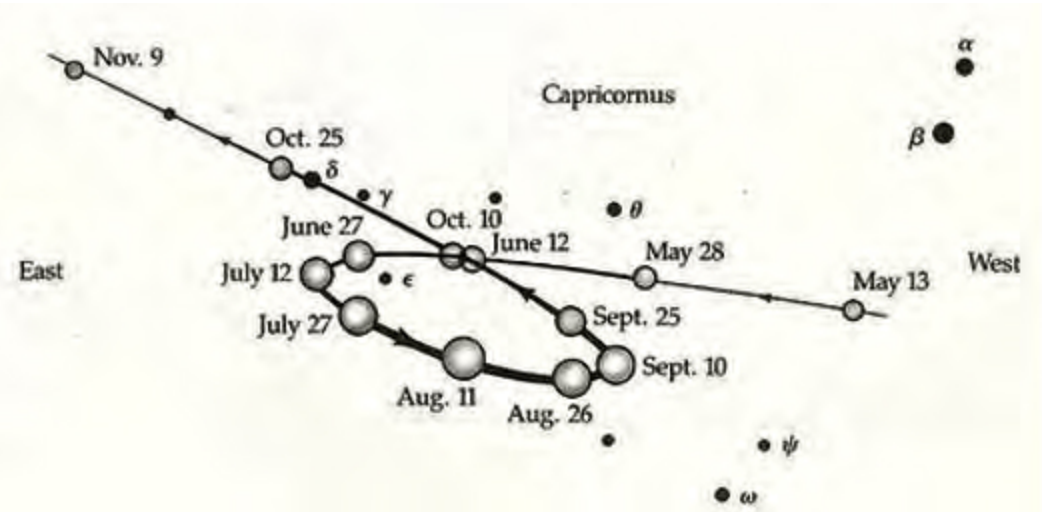


<http://www.pas.rochester.edu/~blackman/ast104/aristotle8.html>

PTOLEMY-ARISTOTLE 'WORLD'

IT IS NOT RIGHT; BRIGHTNESS, SPEED

Sometimes a planet changes its brightness through the months as well as its speed. It can travel uniformly among the fixed stars and then slow down, stop and even progress in the opposite direction. So, the Ptolemy-Aristotle 'world' is not right. In this system a planet like Mars should have a constant brightness. And it should also progress across the night sky at a constant rate, which it doesn't.

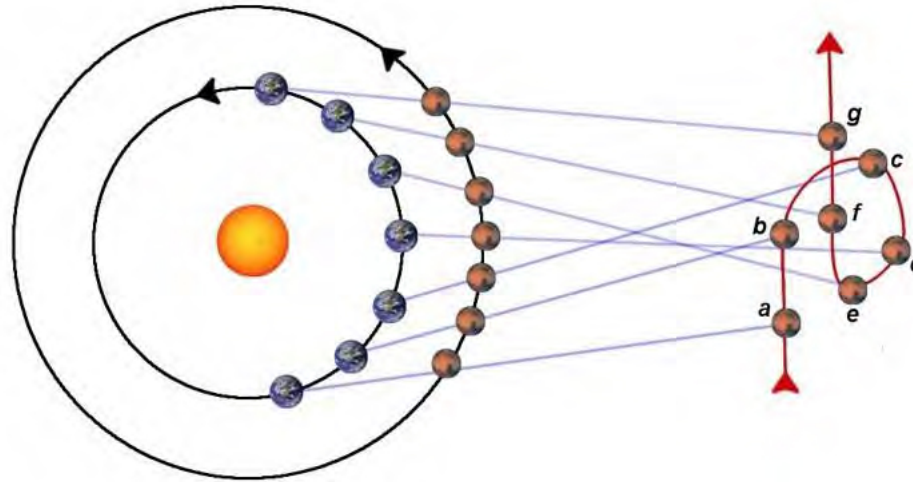


RETROGRADE MOTION OF MARS

The planets are called wanderers (Gk: 'planetai') because unlike the fixed stars they appear to move from west to east in the night sky, sometimes stopping and reversing direction. That's called retrograde motion. Here Mars seems to be traveling backward for a short time compared to the "fixed stars". How was this problem solved?

A solution to this problem was proposed by Claudius Ptolemy (c. A.D. 100-170) in the theory of epicycles and deferents, which the astronomer put to good use in his *Almagest*. This treatise dominated astronomy for fifteen hundred years.

RETROGRADE MOTION

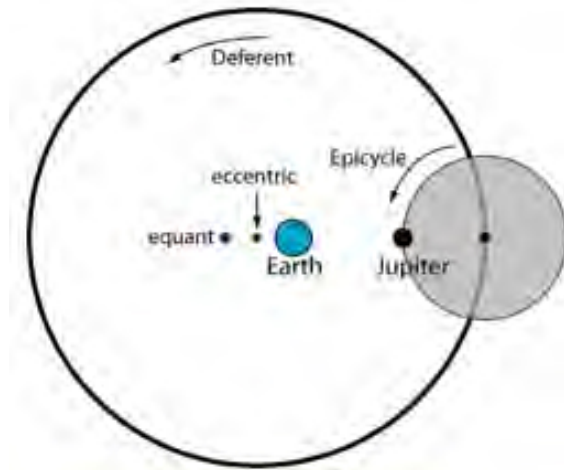


<https://va-iitk.vlabs.ac.in/?page=exp3>

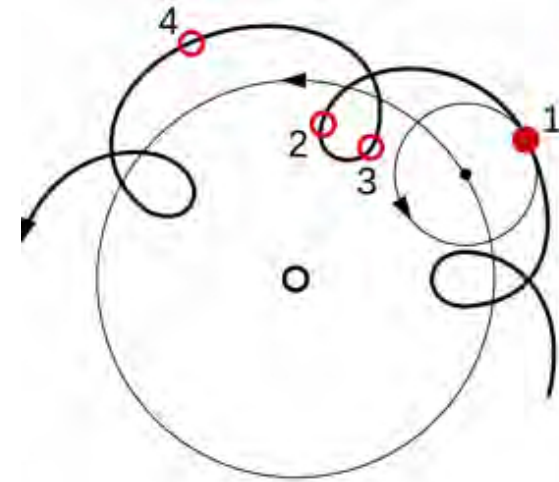
The explanation for retrograde motion is simple geometry. But, the loops that, say Mars makes vary in size and shape. So, this simple geometric diagram is not a good enough explanation.

A theory 'SAVES THE APPEARANCES' if it uses devices (like or fictions put forward purely for the sake of calculations with no claims to correspond with physical reality.

EPICYCLES

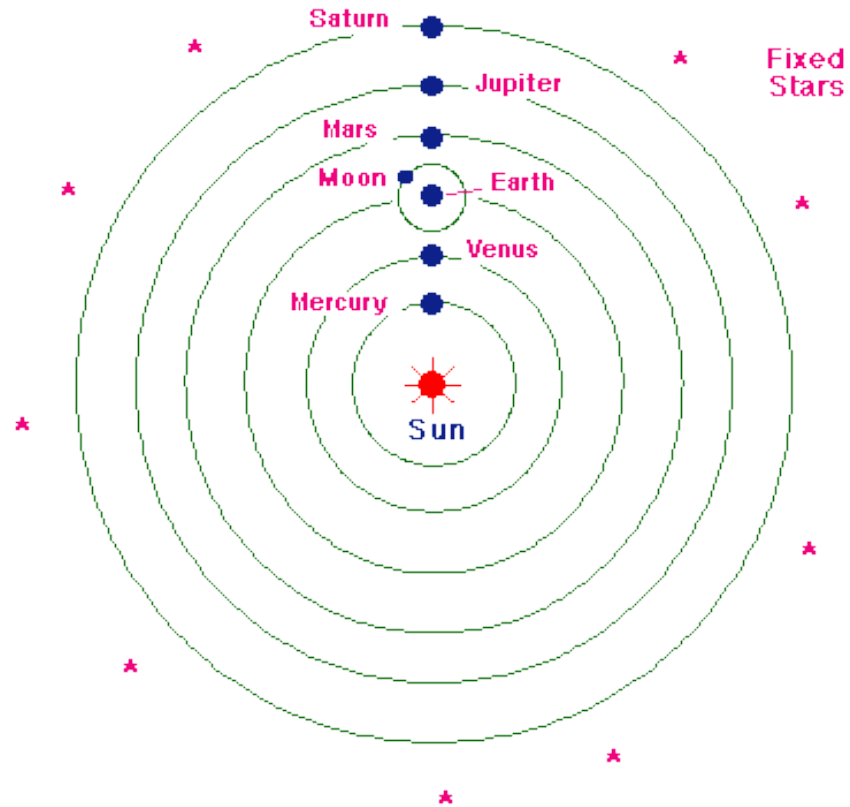


<https://sciencedemonstrations.fas.harvard.edu/presentations/ptolemaic-epicycle-machine>



https://en.wikipedia.org/wiki/Deferent_and_epicycle#/media/File:Epicycle_and_deferent.svg

Aristotle's giant crystalline spheres are gone. Ptolemy argued that planets move on two sets of circles, a deferent and an epicycle. The big circle is the deferent. The epicycle is the little circle moving on the deferent. In the geocentric system the earth is not really at the center of the big circle; the center of the big circle is called the eccentric. This explained retrograde motion and the varying distances of the planets from the earth while keeping the planets in their circular orbits around the Earth. Many books state epicycles on epicycles- to get it more exact. At one time as a measure of complexity, the number of circles is given as 80 for Ptolemy, versus a mere 34 for Copernicus. But, historians examining books on Ptolemaic astronomy from the Middle Ages and the Renaissance have found absolutely no trace of multiple epicycles being used for each planet. [https://en.wikipedia.org/wiki/Deferent_and_epicycle]



<https://www.pas.rochester.edu/~blackman/ast104/copernican9.html>

COPERNICAN 'WORLD'

IT IS NOT RIGHT; BRIGHTNESS, SPEED

As in the Ptolemaic-Aristotelian world, the perfect circular orbits are just wrong for the same reasons.

'EX SUPPOSITIONE', 'SAVING THE APPEARANCES', 'BY HYPOTHESIS'

At the time of Galileo the purpose of astronomy was to “save the appearances” of celestial phenomena. This was a kind of formalism, a means of coordinating data, which had no bearing at all on the ultimate reality of things. Different mathematical devices such as epicycles were advanced to predict the movements of the planets, It was of no concern to the Renaissance astronomer whether such devices touched on the actual physical truth. To save the appearances the Copernican system also used epicycles.

Assuming epicycles is ‘a supposition’. Galileo in his famous letter to Christina points out that there are two senses of ‘suppositions’. One is primary and based on the real absolute truth in nature; the other is secondary and is just a mathematical fiction to explain the appearances in the movements in the stars. Obviously Galileo believed in the former interpretation. This confusion permeated the Galileo Affair. It has evolved into a current debate in the philosophy of science-Realism vs. Instrumentalism.

CONTRADICTS ALL DIRECT EXPERIENCE: We don't feel any sensation of motion. If the Earth moves, why don't we feel that motion? If the Earth is rotating from west to east then objects dropped should land to the west. They don't. There would be an opposite direction wind. (Someone actually calculated the rotation speed of the Earth at the latitude of Florence- about 750 mph.) Surely the wind would topple trees and church steeples.

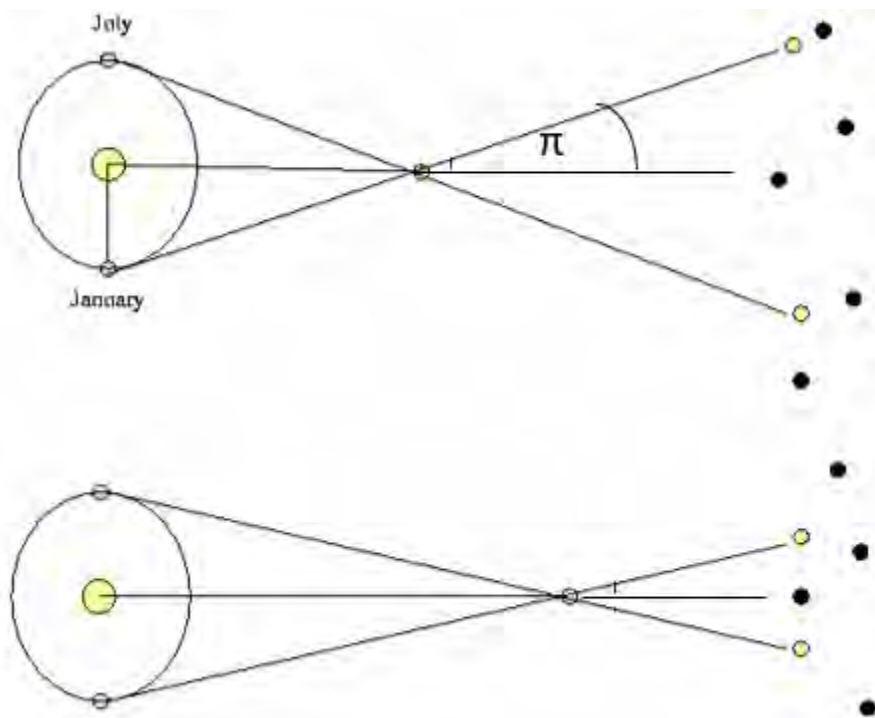
CONTRADICTS OVER 1500 YEARS OF ASTRONOMY AND NATURAL PHILOSOPHY (PHYSICS): There is no explanation for natural motions of terrestrial elements. The massive Earth in the center of the Universe explains why things fall to it. Copernican theory requires a new physics. Galileo was in the vanguard of this endeavor. Newton's first law is simply a restatement of Galileo's findings- a body at rest will remain at rest and that a body in motion will remain in motion unless acted upon by an outside force. Einstein extended this principle which is now called 'Galilean relativity'.

COPERNICAN THEORY CONTRADICTS SCRIPTURE: We will look at some biblical passages later.

OBSERVATIONAL EVIDENCE SUPPORTED A COMPETING COSMOLOGY: This hybrid theory is geocentric and agrees with scripture. We will consider it soon.

THERE IS NO PARALLAX: This is the strongest reason against the Copernican theory. See next page.

CONTRA COPERNICUS: THERE IS NO PARALLAX



https://www.ucolick.org/~bolte/AY4_00/week4/star_distance.html

PARALLAX: Hold a pencil at arms length. Cover your left eye, then cover your right eye. The shift in the position of the pencil relative to the far wall is called ‘the parallax’. Stellar parallax is the apparent shift of position (parallax) of any nearby star (or other object) against the background of distant stars. Technically the angle π (pi for parallax) is the parallax. If the object is close, like the pencil, the shift is easy to see. If it is very far away it would be undetectable. Copernicus’ theory seemed to fail because his estimate of the size of the Universe (up to the background of the fixed stars) was too small.



1838 BESSEL parallax of 61 Cygni

https://commons.wikimedia.org/wiki/File:Friedrich_Wilhelm_Bessel.jpg

Friedrich_Wilhelm_Bessel.jpg



1851 FOUCAULT'S PENDULUM
PROVED EARTH'S ROTATION

https://colnect.com/en/stamps/stamp/27054-Foucault_Leon_1819-1868-Scientists-France

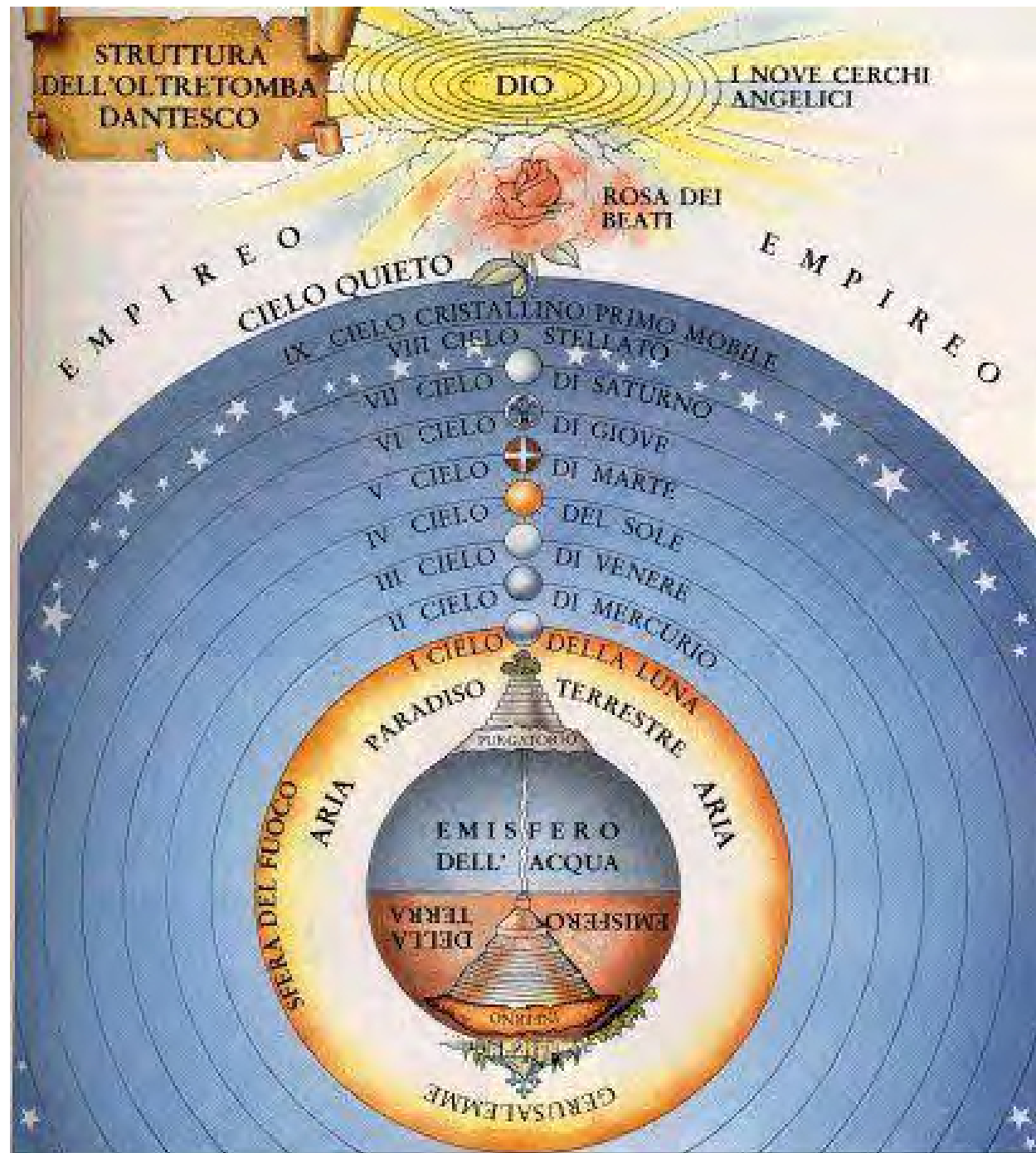
Friedrich Wilhelm Bessel was a German astronomer, mathematician, physicist, and geodesist. He was the first astronomer who determined reliable values for the distance from the sun to another star by the method of parallax. He was the first to measure the parallax of a star almost two hundred years after Galileo's death. Foucault's pendulum introduced in 1851 was the first experiment to give simple, direct evidence of the Earth's rotation. It took over 200 years to vindicate Copernicus about parallax and the rotation of the earth.

DANTE'S COSMOLOGY

NINE SPHERES OF HEAVEN:

THE MOON, MERCURY,
VENUS, THE SUN, MARS,
JUPITER, SATURN,
THE FIXED STARS,
THE PRIMUM MOBILE.

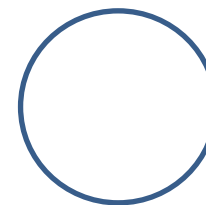
Dante's Cosmology is Aristotelian. Did Copernicus dethrone the status of man? The Church says that the center of the Universe is the worst place you would ever want to be; it is furthest from heaven. According to Dante's *Inferno*, Lucifer resides at the center of the earth.



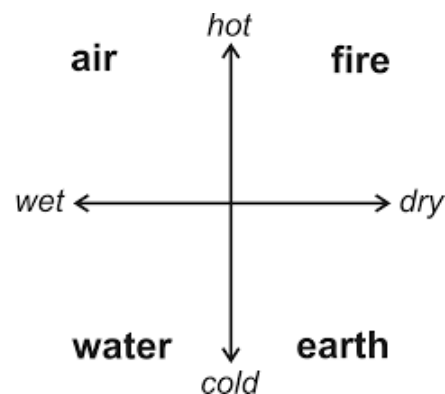
QUINTESSENCE

**CELESTIAL: UNCHANGING, INCORRUPTIBLE
ETERNAL, UNGENERATED**

SUPERLUNARY



SUBLUNARY



MOTION

TERRESTRIAL: CHANGING, CORRUPTIBLE

The two divisions of the Universe in Aristotelian Physics- the sublunary and the superlunary. Motion on Earth is rectilinear, light objects like air and fire move in straight lines upward, heavy bodies, water and earth, downward. There are four elements earth, water, air, fire- constantly changing. The motions of the heavens are circular. God being perfect would only use the purest geometric figure. There is only one superlunary element, the quintessence, a pure, perfect substance-it never changes.

Imagine the reaction of those of the faith- 'This astrologer comes along with his cannon and now says that there is no difference between the heavens and the earth!'



GOD'S TWO BOOKS AS REVEALED BY
 SCRIPTURE

NATURE



SCHOOL OF ATHENS

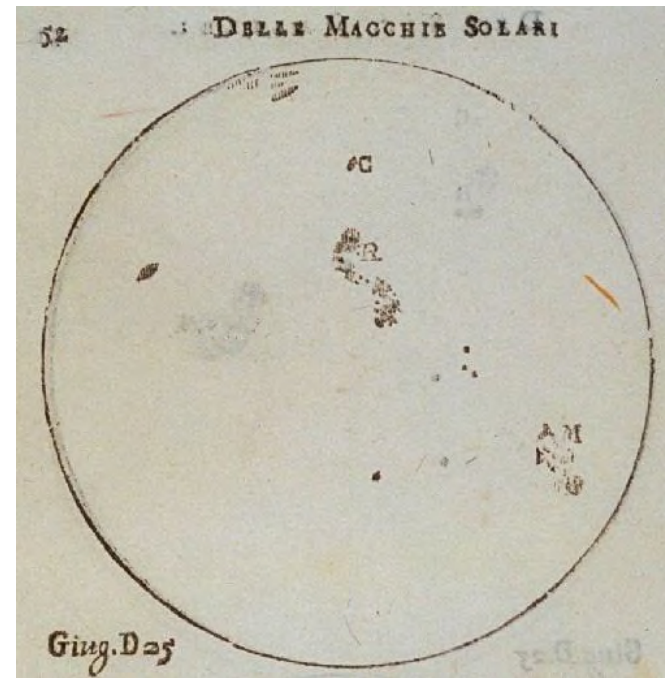
Raphael - 1510 - 1511

CHRISTIAN INTERPRETATION

PLATO: IDEAS, FORM, Only heavenly things

ARISTOTLE: OBSERVATION, EXPERIENCE,
Nature, earthly things are also important.

The School of Athens (1510–11) by Raphael depicts Plato and Aristotle together in conversation. Plato, holding a copy of his dialogue *Timaeus*, points upward to the heavens. He used mathematics extensively in his account of the cosmos in the *Timaeus*. Aristotle, holding his *Ethics*, points palm downward toward the earth. He thought mathematics was secondary or even tertiary. During the Renaissance, Platonism was encroaching upon the predominant Aristotilianism. In the painting Aristotle wears brown and blue, meant to symbolize the weight of earth and water. Plato wears purple and red, colors meant to reflect air and fire, respectively. Symbolism was quite important in the Italian Renaissance, in art as well as in religion.



SUNSPOT LETTERS 1613

GALILEO'S FIRST PUBLICIZED DECLARATION:
HELIOCENTRIC THEORY OF COPERNICUS IS FACT!

Written by Galileo in 1612, the *Sunspot Letters* were published in Rome by the Accademia dei Lincei in 1613. Here Galileo stated that there were dark spots on the face of the Sun. This undermined the traditional Aristotelian view that the Sun was both unmoving and 'pure' (incorruptible). The Sun rotates! The Sun has spots! Galileo was writing to a German banker and astronomer, Mark Welser, who had very close contact with the Jesuits. 'Macchie Solari from the word 'Macchia' 'any kind of spot, speckle, stain or blemish.' (Florio's Italian-English Dictionary 1611; Internet Archives)
This is the first time that Galileo announced publicly that he was a Copernican!

CHRISTOPH SCHEINER S.J.

73 ('APELLES LURKING BEHIND THE CANVAS')

TRES EPISTOLAE DE MACULIS SOLARIBUS
THREE LETTERS ON SOLAR SPOTS

SCHEINER: The sunspots are 'stars' (moons) orbiting the sun.

GALILEO: The sunspots are clouds on the surface of the sun; the sun rotates!



The Vatican Astronomer Dr. Guy Consolmagno (S .J) in his lectures and books said that the Jesuits were the best astronomers and mathematicians at the time. Yes, absolutely! But he neglected to mention the plight of these Jesuit scientists. The General of the Society of Jesus (S. J.) Claudio Acquaviva issued two letters of instruction for all Jesuits to observe; the first May 1611, the second December 1613 . (A coincidence that it was about the same time as the publication of Galileo's *Starry Messenger* and *The Sunspot Letters*?) The essence of these directives was to "teach the doctrines of St. Thomas Aquinas and of Aristotle in philosophy" as long as Aristotle's philosophy does not conflict with the Church's teachings. These Jesuit astronomers were caught between Scylla and Charybdis. Publish the truth and incite the wrath of the Church or follow the dictum and not be true to your profession or yourself. So, to publish, Jesuits used pseudonyms- Scheiner chose 'Apelles'. Apelles was antiquity's greatest painter. The myth is that he hid behind the canvas to hear what the critics said.

I am convinced that Galileo was somewhat justified in his caustic remarks to his Jesuit colleagues because of this.



GENERAL CLAUDIO ACQUAVIVA
 HEAD OF THE JESUITS

LETTERS TO THE JESUITS

May 24, 1611, Dec 14, 1613

“SOLID AND UNIFORM DOCTRINE”

TEACHING

ST. THOMAS AQUINAS-THEOLOGY

ARISTOTLE-PHILOSOPHY

Notice the dates on the two letters; the first, one year after the publication of *the Starry Messenger*, the other the year of the publication of *The Sunspot Letters*. The natural philosophy (physics) of Aristotle was crumbling. If that happened, would the whole structure itself give way? Acquaviva stated that one should believe Aristotle’s philosophy as long as it does not deviate from Christian teaching. Cardinal Bellarmine, a key player here, (we will see him soon). “Blind obedience,” Bellarmine argued, “is nothing but that obedience which is pure, perfect and simple.”

Ref. *Empire of Souls: Robert Bellarmine and the Christian Commonwealth* Ch 2. Stefania Tutino



RAFAELLO DELLE COLOMBE DOMINICAN PREACHER

SERMON: FEB. 1613

ADDRESSED TO "AN INGENIOUS MATHEMATICIAN"

SERMON: PROBABLY DEC. 8, 1615

FEAST OF THE IMMACULATE CONCEPTION

"An ingenious academic...

...Who could fixedly look at the infinite light of the Divine Sun... the sun is without spot, and the mother of the sun is without spot..."

Can you imagine the furor of the people against this ingenious academic on that Sunday morning?

BELLARMINE AND SCRIPTURAL EXEGESIS
HIS VIEW OF THE UNIVERSE
LETTER TO THE ROMAN COLLEGE
THE HAMMER OF HERETICS

He was one of the most important figures in the Counter-Reformation, supporting the reform decrees of the Council of Trent. He was a professor of theology and later rector of the Roman College, and in 1602 became an archbishop.

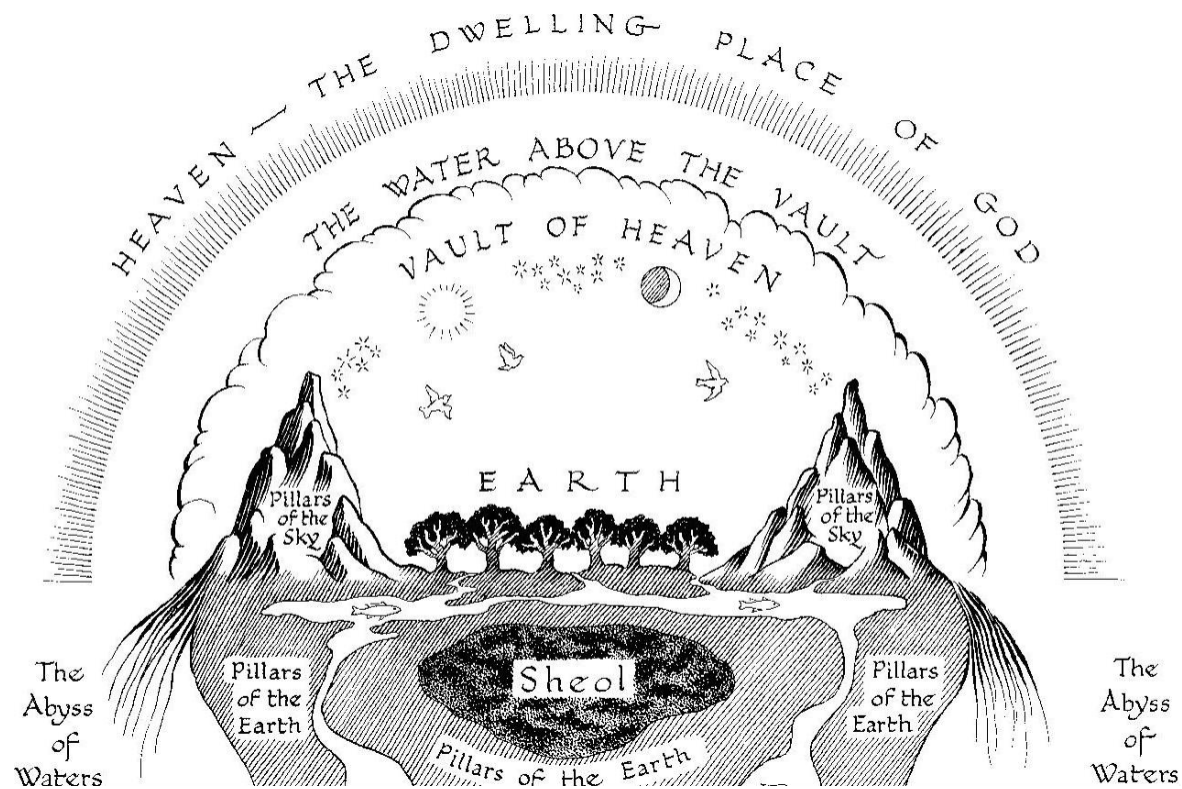
Upon the death of Pope Sixtus V in 1590, he was a possible candidate for the papacy but was thought to be too scholarly for that exalted position. He received some votes in the 1605 conclaves which elected Paul V, and also in 1621 when Gregory XV was elected. (In 1616 he published *Linguae Hebraicae*, a Hebrew grammar!)

Bellarmino was canonized a saint in 1930 and named a Doctor of the Church, one of only 37.

ROBERTO CARDINAL BELLARMINO S.J.



October 1542–September 17, 1621



BIBLICAL COSMOLOGY

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Although a Jesuit, Bellarmine did not adhere to the Aristotelian view of the cosmos. As we read in his earlier *Louvain Lectures*, he followed the creation as put forth in Genesis. Bellarmine believed that the heavens were geocentric and geostatic, based upon scriptural passages. He thought that the heavens are mutable (made of possibly fire instead of ether) and subject to change unlike the Aristotelian view propounded by the Church. What would father Acquaviva say about that?



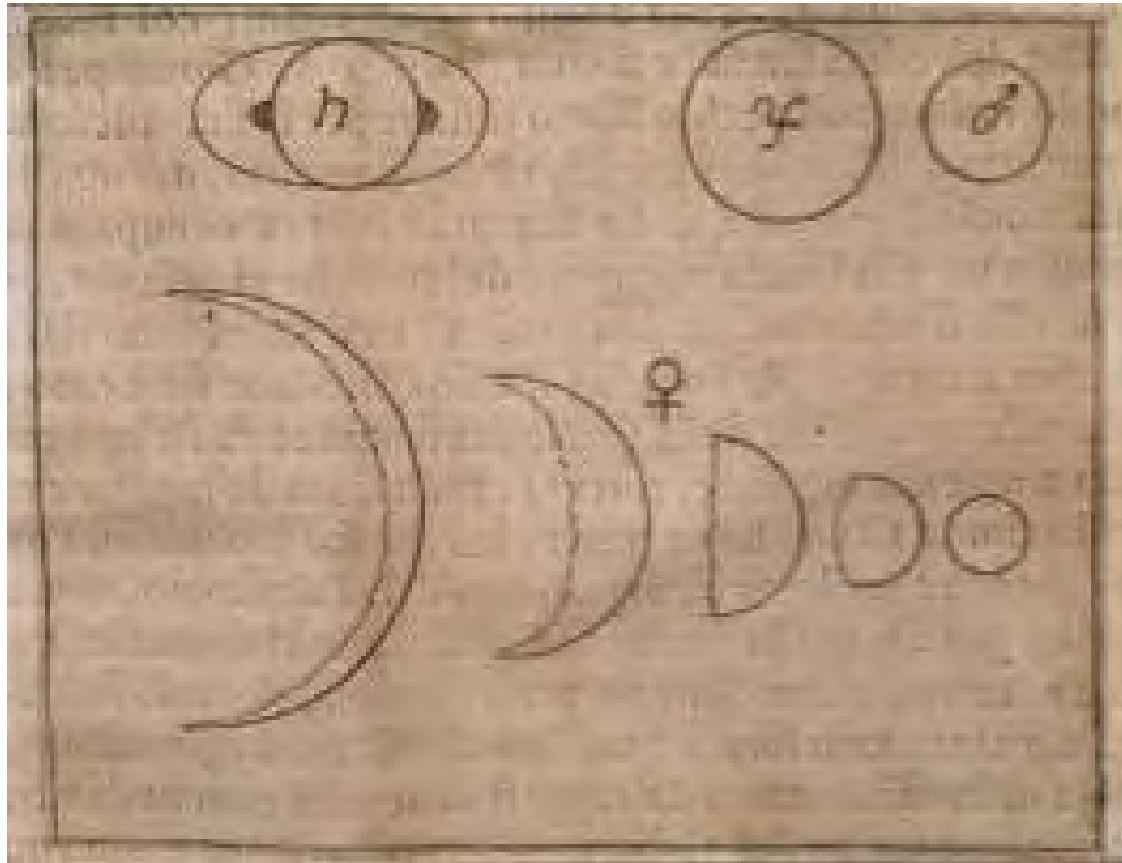
BELLARMINE'S LETTER TO ROMAN COLLEGE

April 19, 1611

Re: GALILEO'S DISCOVERIES

1. Were there really a multitude of stars invisible to the naked eye?
2. Was Saturn composed of three stars together?
3. Did Venus really have phases like the moon?
4. Was the lunar surface really rough and uneven?
5. Did Jupiter really have four satellites revolving around it?

Notice the first item- Is he concerned that this might contradict the 7 stars (the Pleiades) as mentioned in Revelation? (The Apocalypse of John). Or is there another reason? We will see why later.

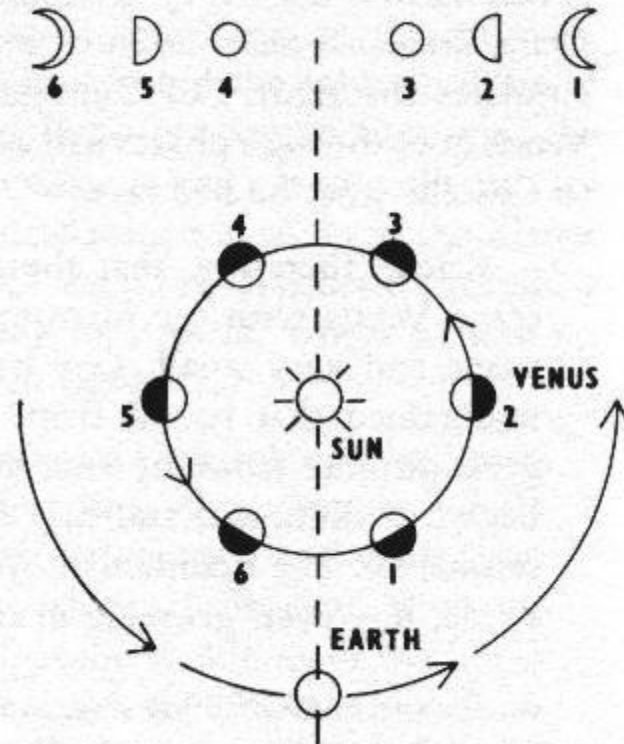
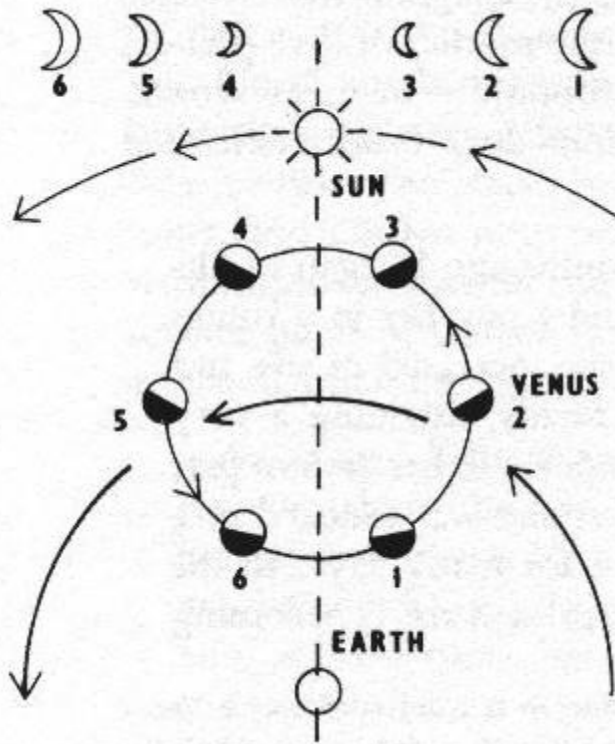


https://www.astronomy2009.org/resources/multimedia/images/detail/galileo_12/index.html

PHASES VENUS; 'HORNS' OF SATURN

Galileo's telescope did not have sufficient magnification to discern the rings of Saturn. He thought the planet was a disk with two adjacent smaller disks.

But the planet Venus went through the whole sequence of phases and this fact was crucial!



<https://www.cloudynights.com/articles/cat/articles/the-discoveries-of-galileo-%E2%80%93-part-4-venus-r3292>

PTOLEMAIC

COPERNICAN

THE OBSERVATION THAT VENUS GOES THROUGH PHASES LIKE THE MOON PUTS THE NAIL ON THE COFFIN OF THE ARISTOTELIAN-PTOLEMAIC UNIVERSE! Copernicus is vindicated! Galileo won! Well, not quite, as we will shortly see.