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UNIVERSITY
IN TORUŃ



*Between Copernicus
and Calcagnini:
the Studium and the
scientific environment
in Ferrara*

Nicolaus Copernicus and the Culture of Remembrance

13–15.09.2023

NCU Collegium Humanisticum

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Italy

The Este dynasty during the age of Copernicus and Calcagnini



The Duke Ercole I
(1431-1505)



The Duke Alfonso I
(1476-1534)



The Duke Ercole II
(1508-1559)

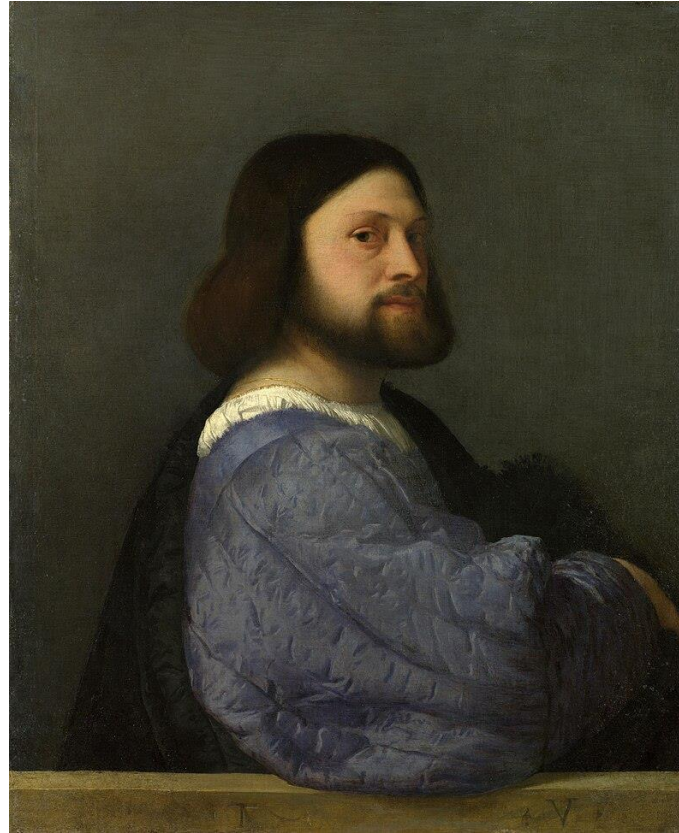
FERRARIA.



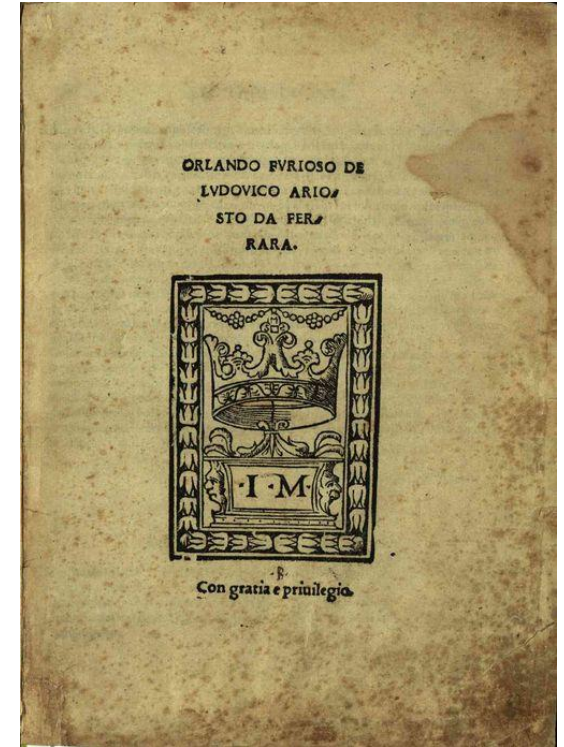
Humanities in Ferrara



The Cardinal Ippolito d'Este
(1479-1520)



Ludovico Ariosto
(1474-1533)



Editio princeps of
Orlando Furioso (1516)

The cultural environment in Ferrara through the words of Ludovico Ariosto



Veggio il **Mainardo**, veggo il **Leoniceno**,
il **Pannizzato**, e **Celio** e il **Teocreno**.

[...] Ecco il dotto, il fedele, il diligente
secretario **Pistofilo**



[...] Poi cardinale appar, ma giovinetto
sedere in Vaticano a consistoro,
e con facondia aprir l'alto intelletto,
e far di sé stupir tutto quel coro.

We see a honourable group
of philosophers and poets

[...] *Di filosofi altrove e di poeti*

si vede in mezzo un'onorata squadra.

Quel gli dipinge il corso de' pianeti,

questi la terra, quello il ciel gli squadra:

questi meste elegie, quel versi lieti,

quel canta eroici, o qualche oda leggiadra.

Musici ascolta, e varii suoni altrove;

né senza somma grazia un passo muove.

(*Orlando Furioso*, 3° edition, 1532, XLVI)

The Studium of Ferrara between the 15th and the 16th century

The Studium of Ferrara was divided into:

- the *Universitas iuristarum*
- the *Universitas artistarum*

Some important lecturers of the Studium of Ferrara in the last decades of the 15th century were:

- Giambattista Guarini, professor of rhetoric
- **Nicolò Leoniceno**, professor of medicine, mathematics and moral philosophy
- **Pietro Bono Avogaro**, lecturer of astronomy and author of astrological papers and predictions.

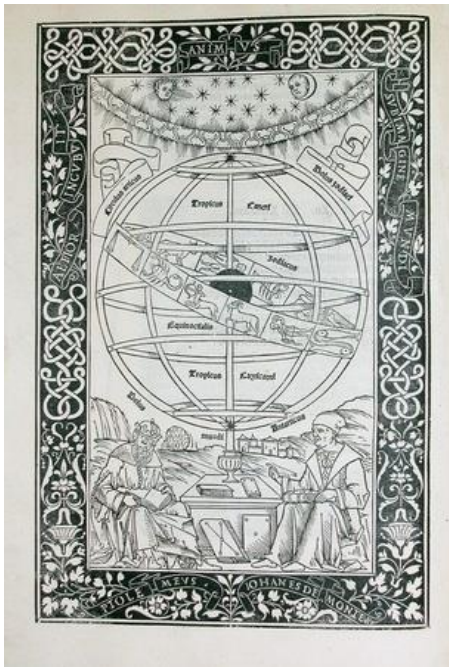


Astronomy in Ferrara in the 15th century

Giovanni Bianchini was one of the most important mathematicians and astronomers of the 15th century. He was the author of the *Tabulae astrologiae*.



Scientific relationship with the astronomers **Georg Peurbach** and **Regiomontanus**



Frontispiece of *Epitome of Ptolemy's Almagest* (1496)



Georg Peurbach, *Novae theoricæ planetarum* (1534)



Giovanni Bianchini introduced by Borso I d'Este offers Emperor Frederick III a copy of the *Tabulae Astrologiae*

Astronomy in Ferrara in the 15th century

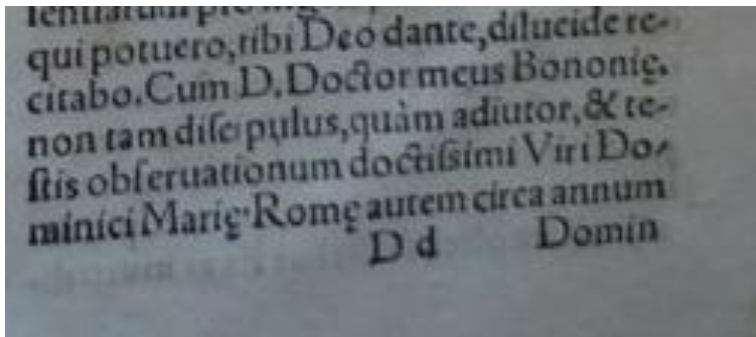
Domenico Maria Novara (1454-1504) was student of Giovanni Bianchini in Ferrara.

In 1484 he graduated in arts and medicine in Ferrara.

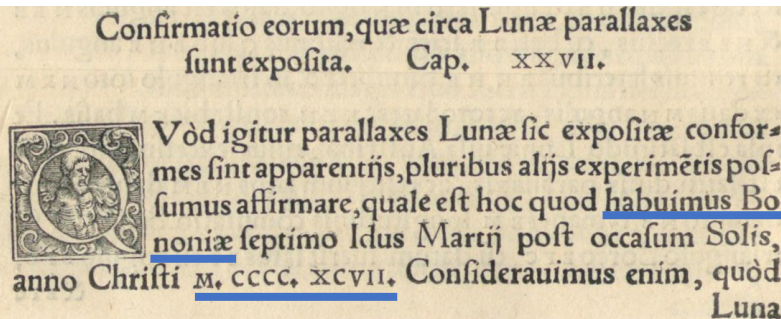
Since 1483 Novara was professor of astronomy in Bologna (*ad lecturam Astronomiae de mane diebus continuis et ordinariis et fiat Judicium et Tacuinum*).

Dominici Mariae ferrariensis... qui vir divino ingenio praeditus fuit Nicolai Copernici praeceptor

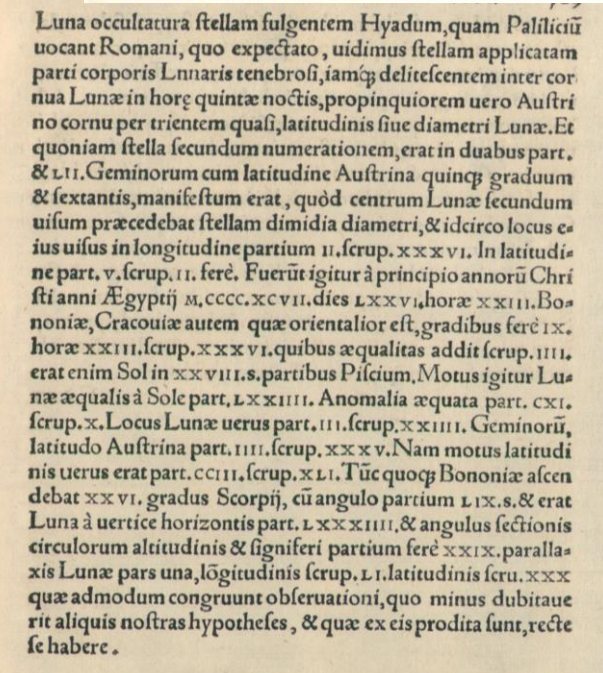
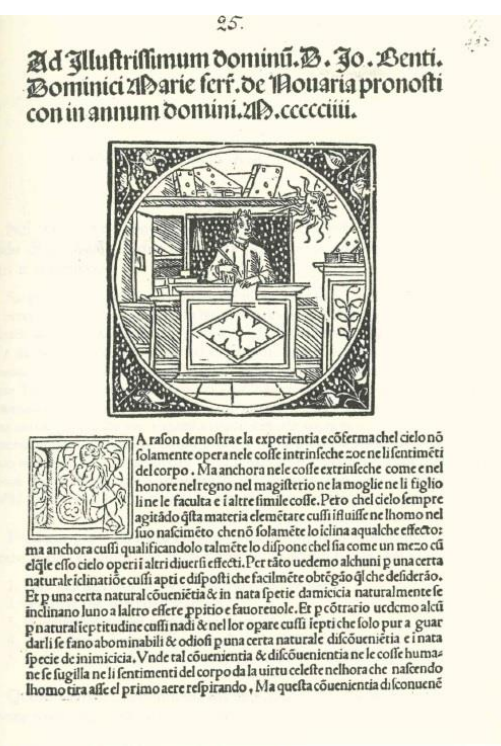
Novara was professor of Copernicus during his stay in Bologna. Copernicus and Novara made some astronomical observations in Bologna (1497, 1500).



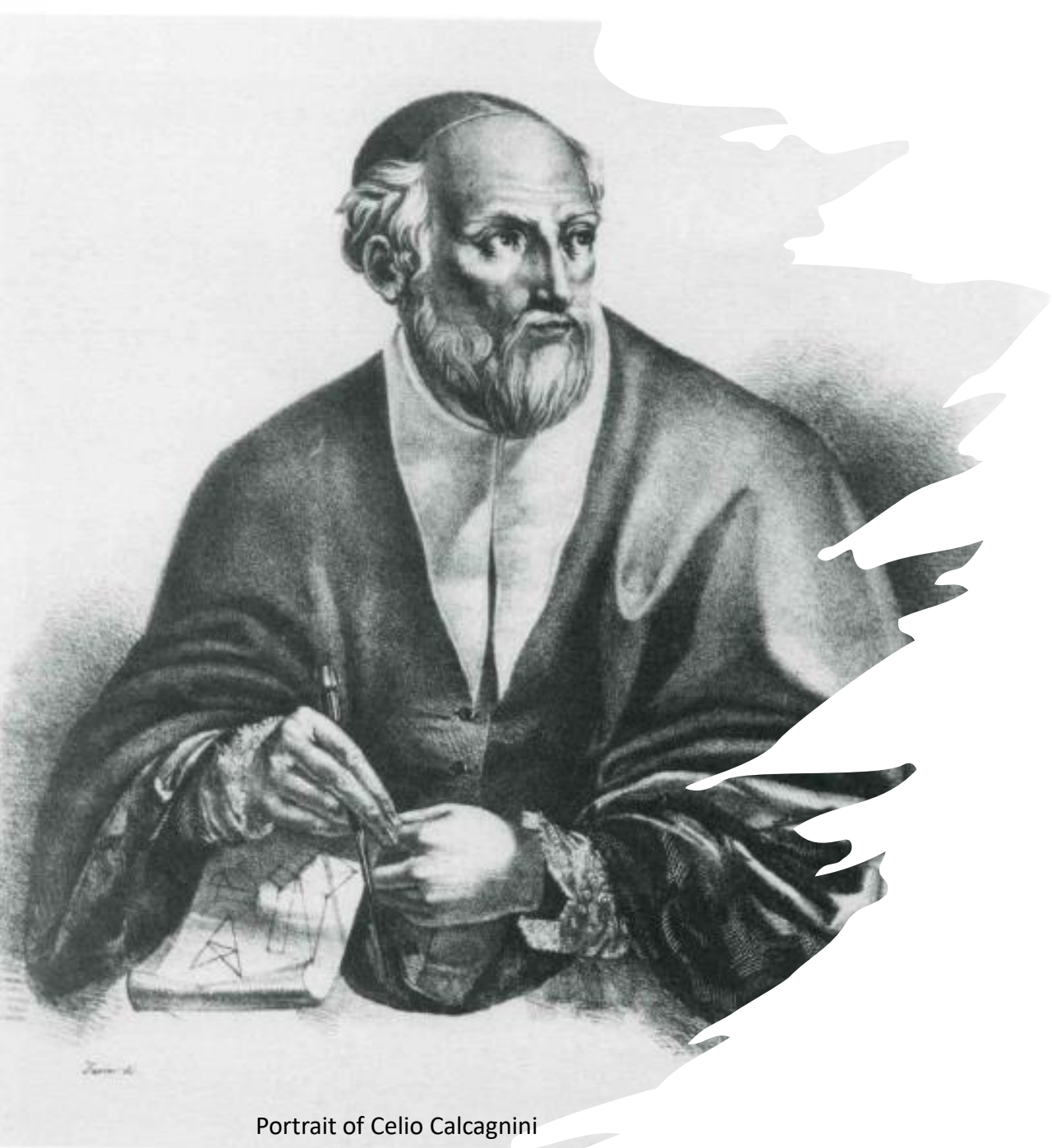
Georg Joachim Rheticus, *Narratio prima*, 1540



Copernicus, *De revolutionibus*



Celio Calcagnini in Ferrara



Portrait of Celio Calcagnini

- Celio Calcagnini (1479-1541) was a diplomat, humanist and scientist at the service of the Duchy of Ferrara.
- 1509. Calcagnini was appointed at the chair of *utriusque linguae* at the Studium of Ferrara
- 1510. He became Secretary of the Cardinal Ippolito d'Este.
- 1518-1519. Diplomatic mission in Hungary
- From 1520. Calcagnini devoted himself to literary studies and to the teaching in the University of Ferrara.

The diplomatic mission in Hungary

Since 1498 the episcopate of Eger was assigned to the Cardinal Ippolito d'Este.



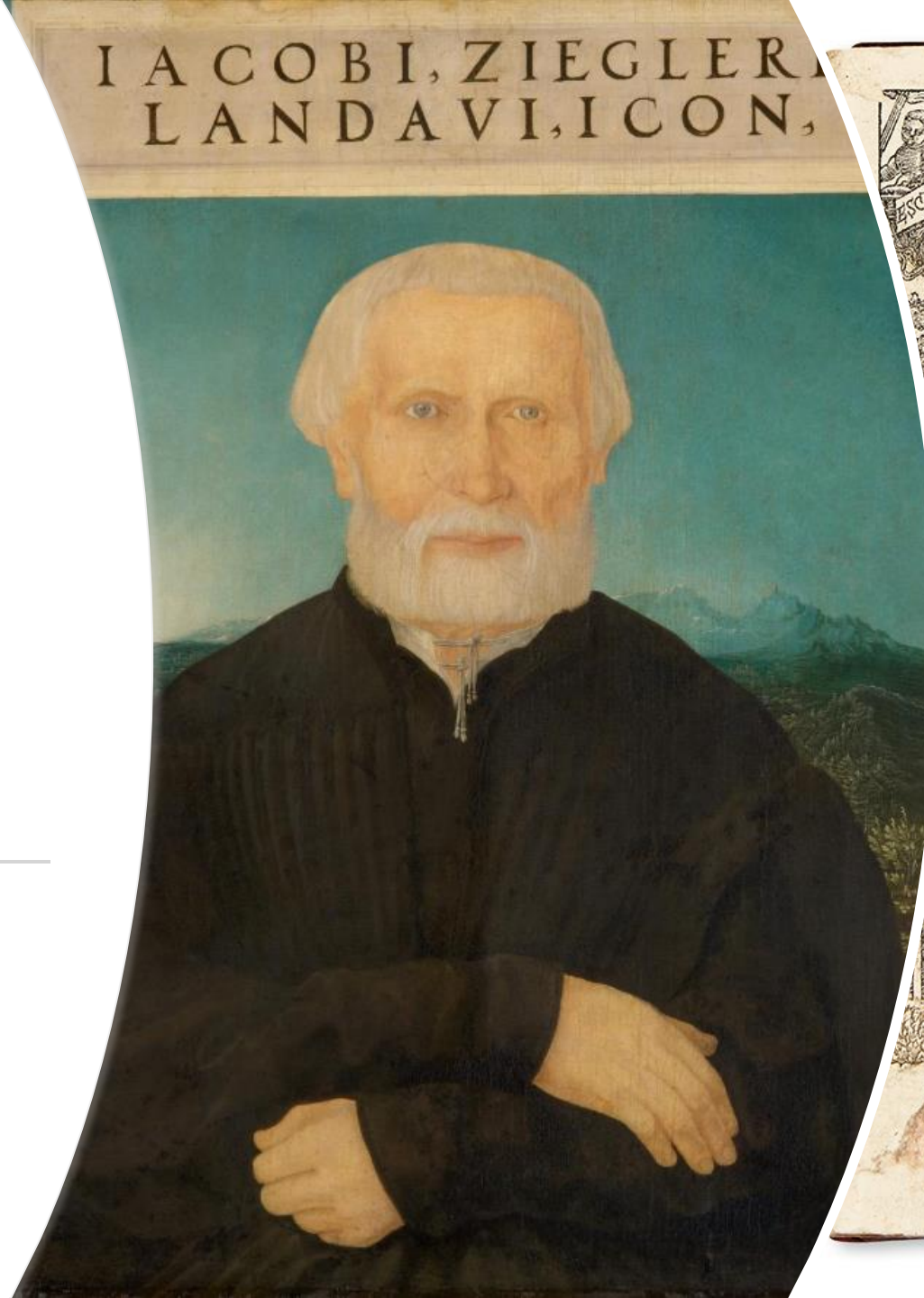
The Eger Castle



Renaissance fresco of the coat of arms of bishop Ippolito d'Este in the castle of Eger

IACOBI, ZIEGLER
LANDAVI, ICON,

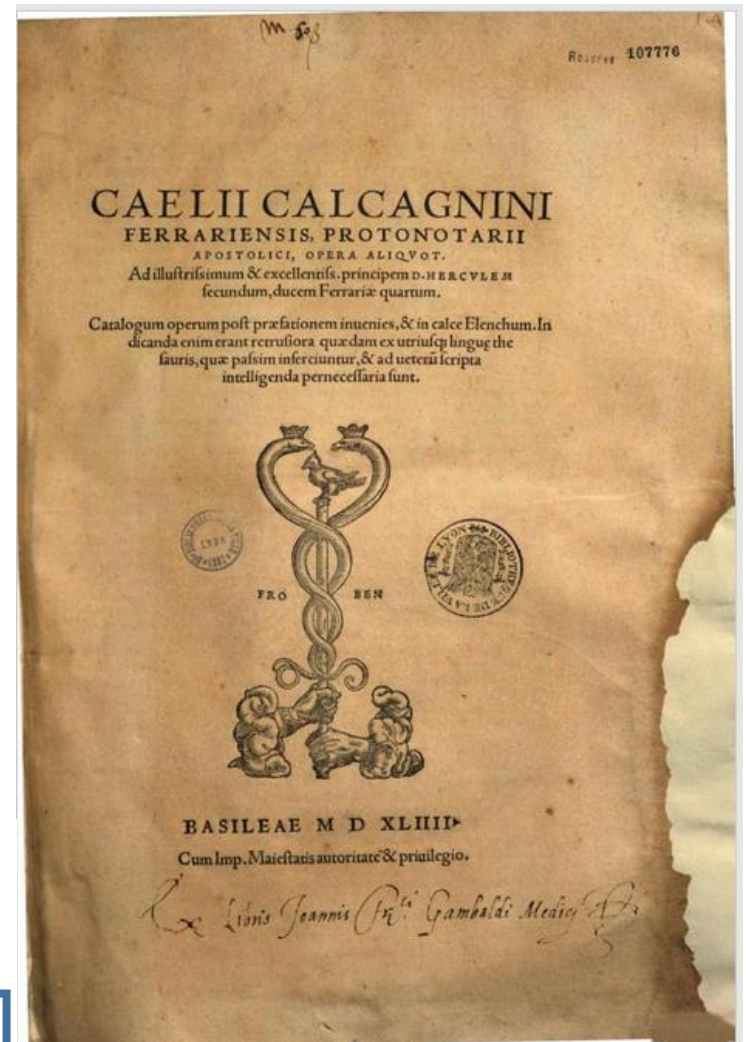
The scientific relationship with Jacob Ziegler



Opera aliquot (1544)

- After the death of Calcagnini, Giangirolamo da Monferrato was charged to select all the completed works of Calcagnini and to collect them in a single volume.
- The edition of the volume was superintended by Antonio Musa Brasavola.
- The volume was offered to the duke Ercole II.
- It contained both works and letters written by Calcagnini.

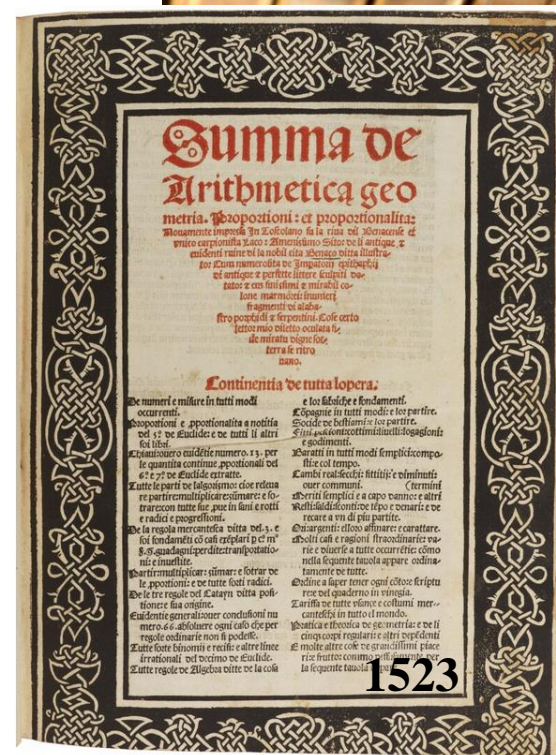
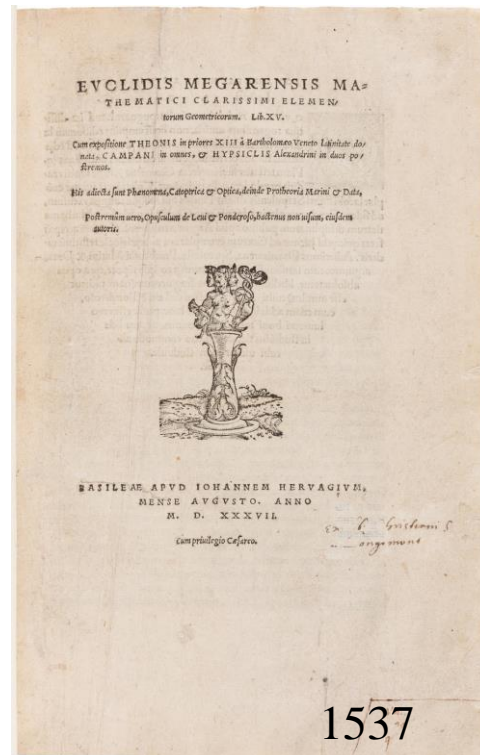
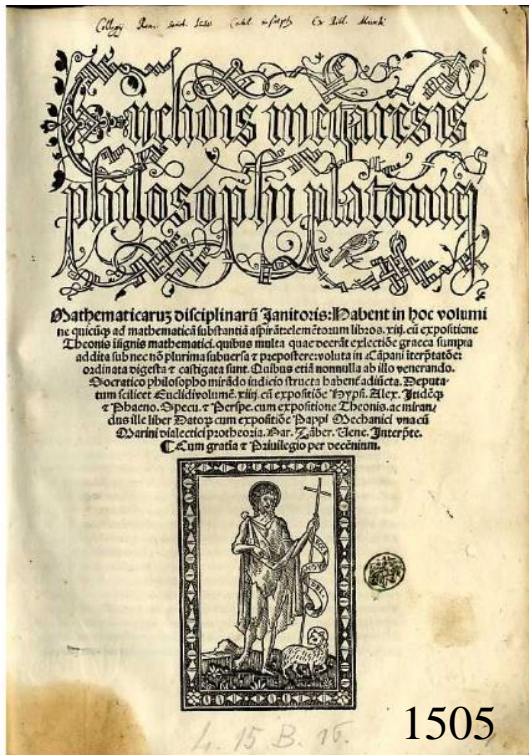
tatem sunt, sibi arrogantes. Quæ ita iuncta & copulata sunt inter se natura, ut sine piaculo disiungi nō possint. Nam sicut in corpore humano nihil frustra positum est, quod ad suum opus sit institutum, cæterisque partibus respondeat, ut non sine perniciæ auelli possit: ita disciplinæ, id est humanitatis membra, inter se connexæ sunt, ut seorsum politæ mancæ ac mutilæ sint. Nemo ergo phylica sine logicis, nemo logica sine mathematicis, nemo omnia sine orationis præsidio assequat. Quare belle hanc harmoniam nonnulli *εγκυκλοπαιδία* dixere. Quod si philolophia est humanarum diuinarumque rerum cognitio, si humanitas est earum rerum quæ ad hominem perti-



Calcagnini's library

[...] *libros suos in publicam utilitatem reliquit.*

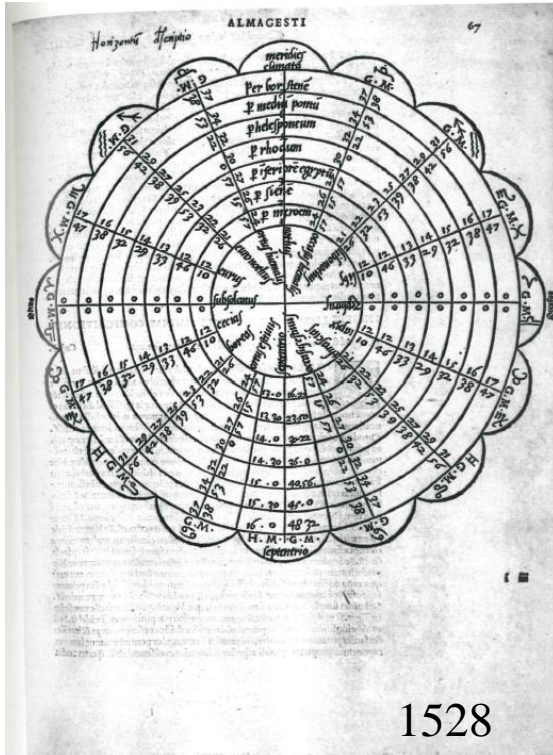
Mathematical works



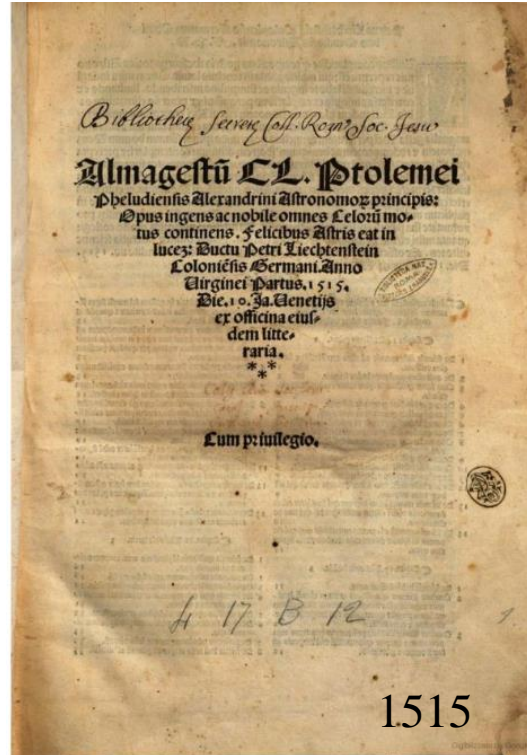
Calcagnini's library

[...] *libros suos in publicam utilitatem reliquit.*

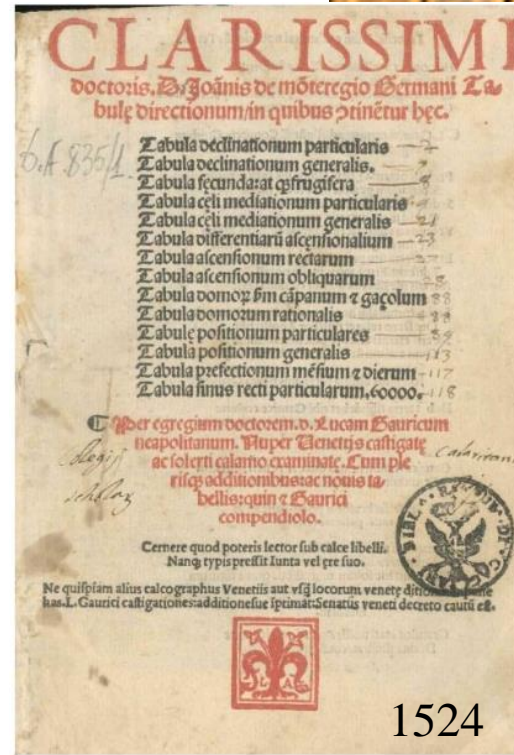
Astronomical works



1528



1515



1524

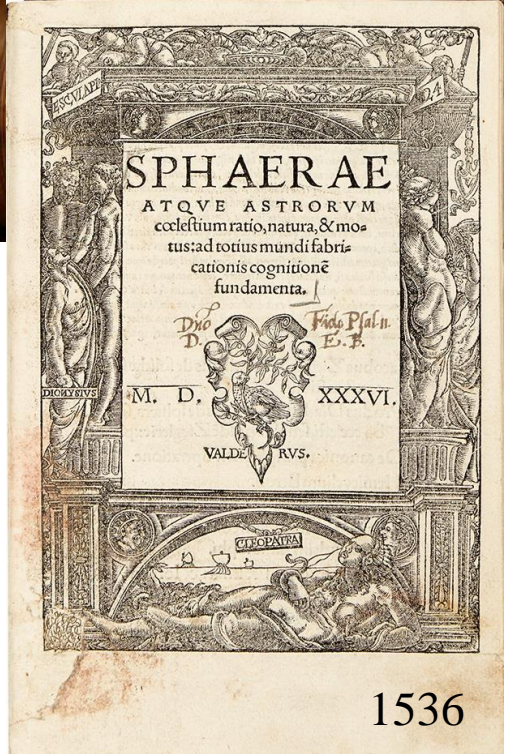
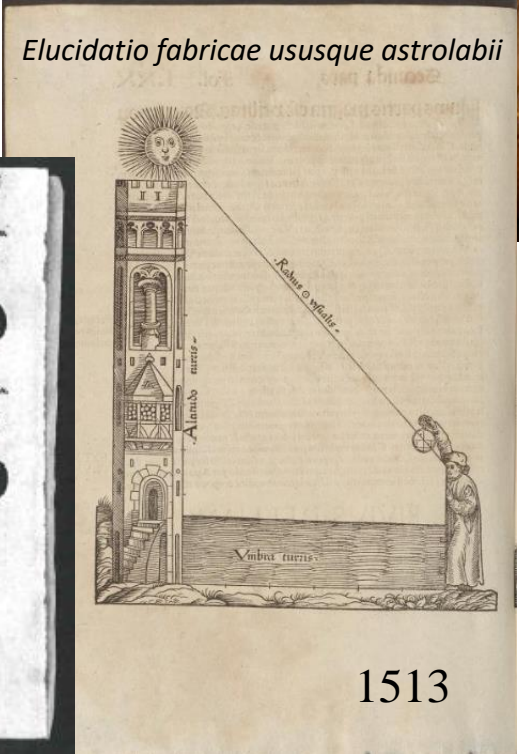
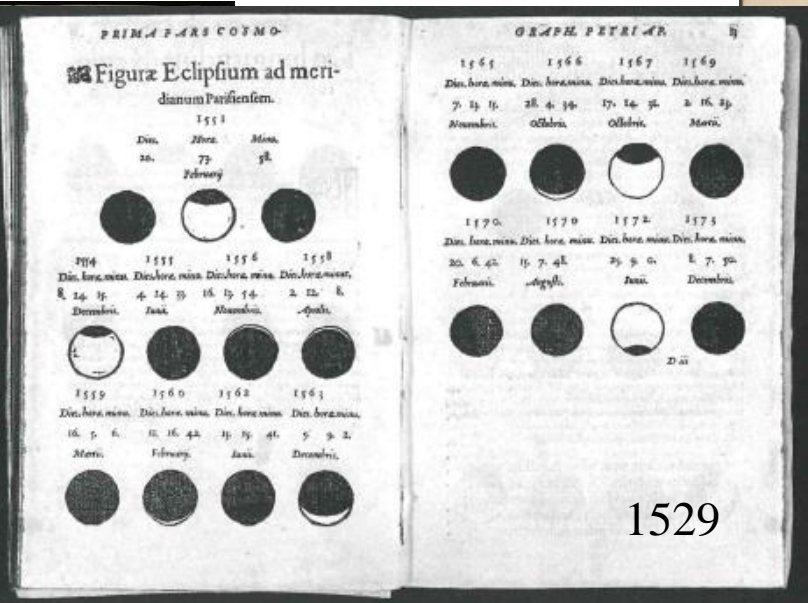
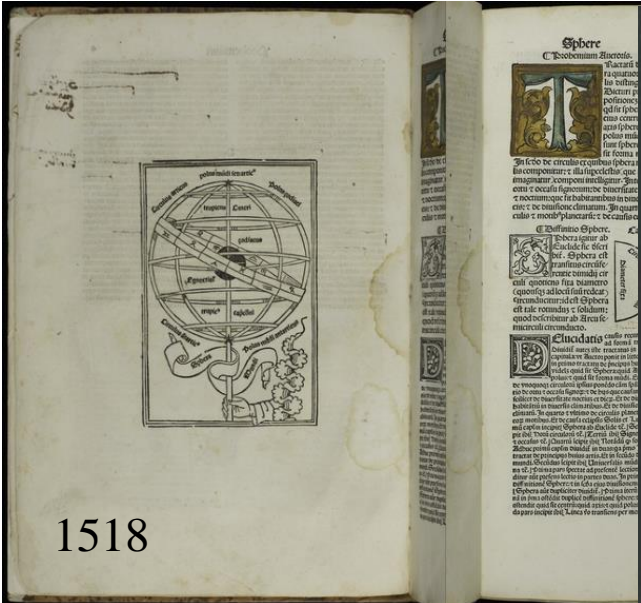


Luca Gaurico edited astronomical and mathematical works.

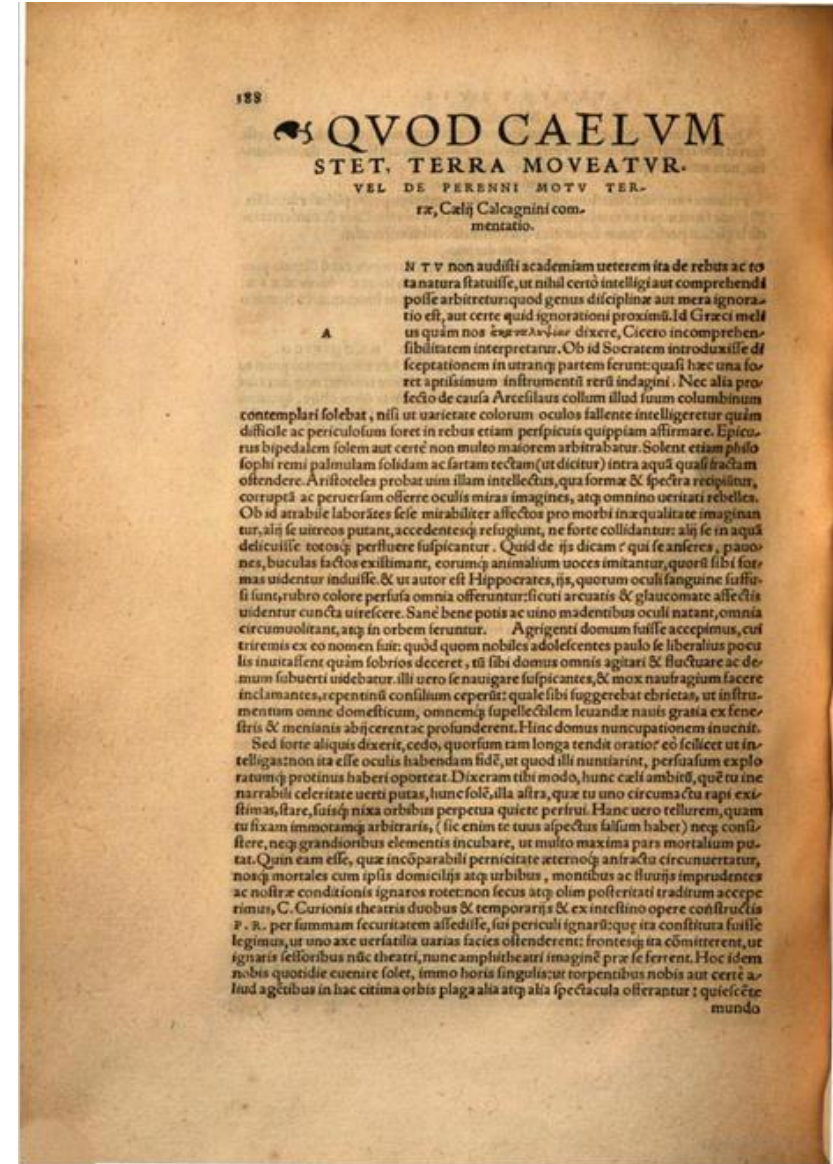
Calcagnini's library

[...] *libros suos in publicam utilitatem reliquit.*

Cosmological works



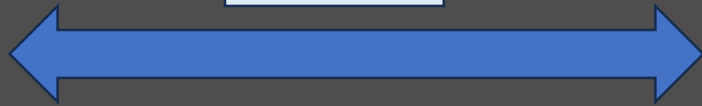
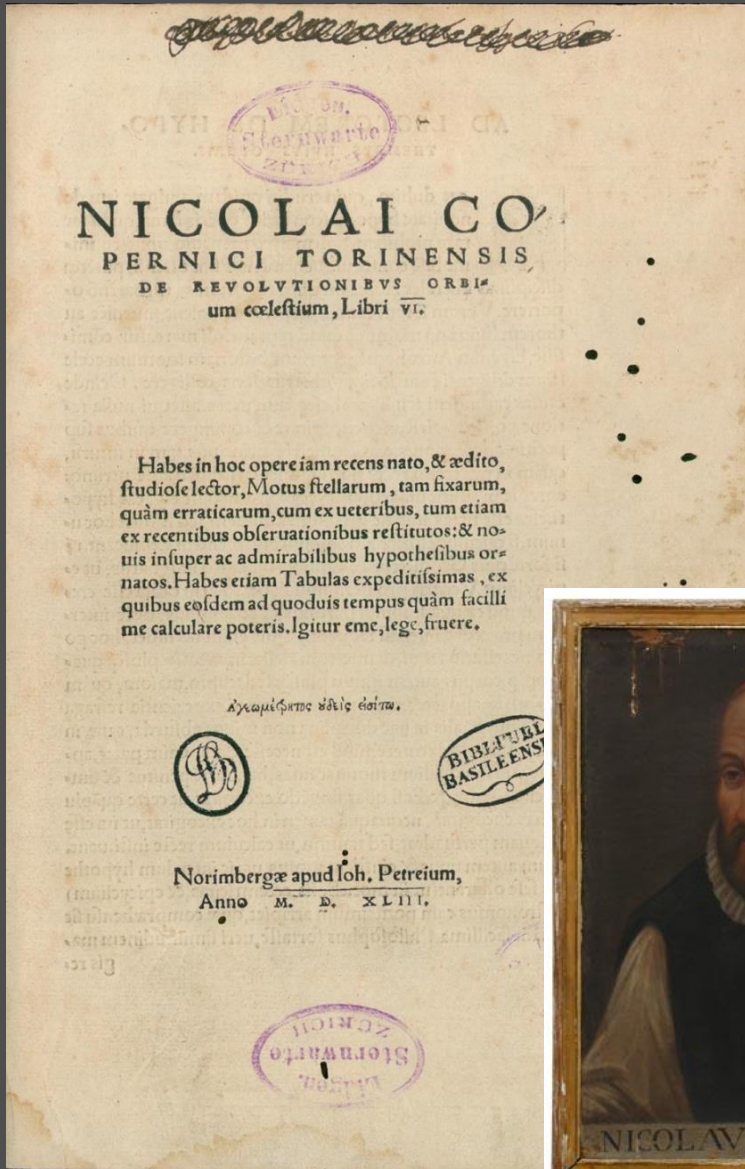
Quod Caelum stet, Terra moveatur,
vel de perenni motu terrae



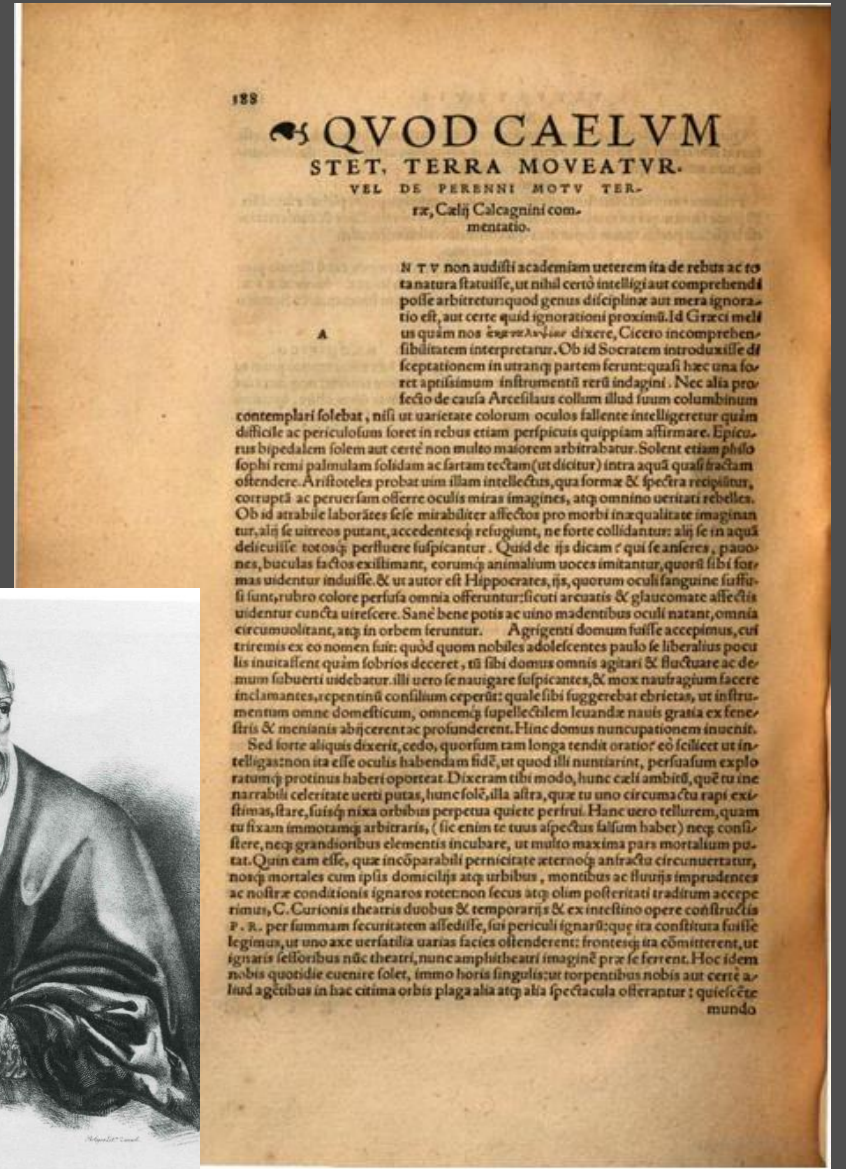
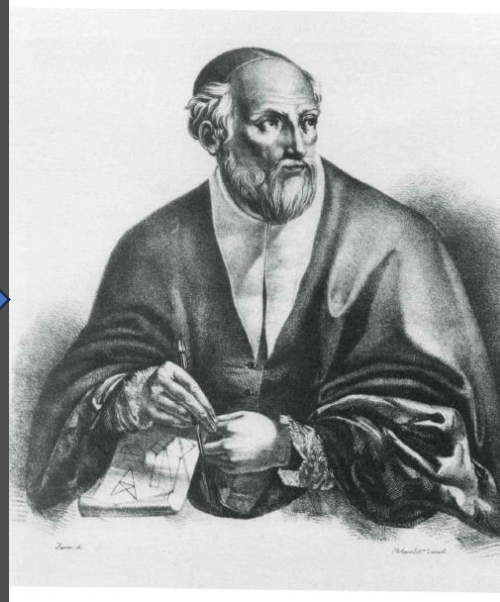
Sed forte aliquis dixerit, cedo, quorsum tam longa tendit oratio: eò scilicet ut intelligas: non ita esse oculis habendam fidē, ut quod illi nuntiarint, persuasum exploratumq; protinus haberi oporteat. Dixeram tibi modo, hunc cæli ambitū, quē tu inenarrabili celeritate uerti putas, hunc solē, illa astra, quæ tu uno circumactū rapi existimas, stare, suisq; nixa orbibus perpetua quiete perfrui. Hanc uero tellurem, quam tu fixam immotamq; arbitraris, (sic enim te tuus aspectus falsum habet) neq; consistere, neq; grandioribus elementis incubare, ut multo maxima pars mortalium putat. Quin eam esse, quæ incōparabili pernecitate æternoq; antractu circunuertatur, nosq; mortales cum ipsis domicilijs atq; urbibus, montibus ac fluuijs imprudentes ac nostræ conditionis ignaros rotet: non secus atq; olim posteritati traditum accepimus, C. Curionis theatris duobus & temporarijs & ex intestino opere constructis P. R. per summam securitatem assedisse, sui periculi ignarū: quæ ita constituta fuisse legimus, ut uno axe uersatilia uarias facies ostenderent: frontesq; ita cōmitterent, ut ignaris sessoribus nūc theatri, nunc amphitheatri imaginē præ se ferrent. Hoc idem nobis quotidie euenire solet, immo horis singulis: ut torpentibus nobis aut certè aliud agētibus in hac citima orbis plaga alia atq; alia spectacula offerantur: quiescēte

The celestial sphere, that you think moving with incredible velocity is immobile and lies in a state of rest.

This earth, that you think unmovable and motionless, rotates and rotates us mortals with incomparable speed and continuous rotation without noticing it.



There was no direct link or relationship between Copernicus and Calcagnini



In his ergo, in quibus sensus parū officio suo defungi possunt, & uel certo aliquo obij
ce impediuntur, aut locorum distantia circumscribuntur: nihil expedit magis ad ex
plorandam ueritatē, quā prouocare ad rationem, & argumenta scrutari, quæ rei
dubiæ fidem faciant. Est enim uetus illa inclamatio apud Platonē in Gorgia, *ὅς τῶν*
ἡμῶν ἀφοραὶν δ' αὖ φιλόσοφον, καὶ μὴ εἰς τὴν ὄψιν. Oportere hominem philosophum non o
culos sed mētē intueri. Tecum ergo sic cogita. An non ea quæ supra lunam po
sita sunt & cælo finitima, æterna sunt, immortalia, ab omni commutationis iniuria
longe aliena: An nō quæ citima sunt, mortalia, caduca, ad uicissitudines alternatio
nesq; semper exposita: & qualia Plato in Timæo scripsit semper fieri, esse nūquam.
Sanē si hæc sentētia ita recepta est, ut ab omnibus cōprobetur, non uideo quomodo
æternis illis immortalibus ac semper sibi constantibus possit motus conuenire: præ
fertim quom nihil aliud sit motus, quā mutatio & ex loco ad locum migratio. Neq;

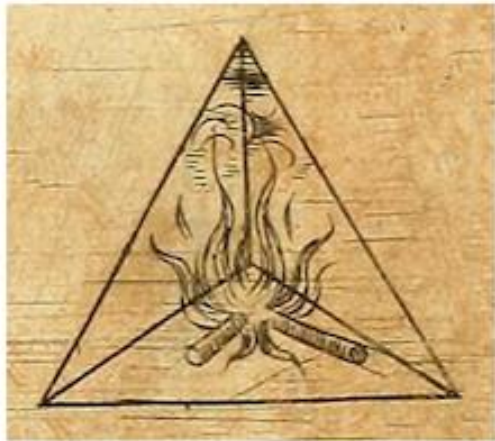
Calcagnini suggested to be led by reason and confirmed his attempts of proof showing the fallacy of the impressions due to the senses.

Talking about the Earth, Calcagnini quoted the calculations made by Eratosthenes to estimate the circumference of the Earth.

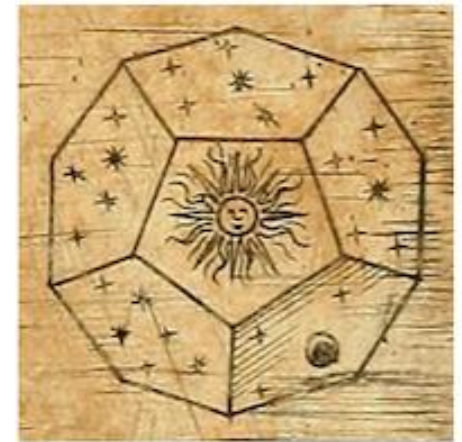
...us & eorum quæ in ipso sunt, perpetuitate & constantia, uel ipsam multitudinem
sionem, ad eam quam octauā sphaeram appellant præsertim relatam. Quantus enim
eius sit ambitus, immēsum est, & supra mortalem captū enuntiare, eam certē quom
horis quatuor & uiginti suum spatium dicatur conficere, necesse erit supra millena
centena passuum millia momentis singulis tranare: ut statis horis omnē anfractum
decurrat, & ueluti dimensum diurnū impleat. Quod posse fieri neq; corporis quan
tumuis cōcitati ratio, neq; ipsa humani animi pernicitas, si modo per partes differri
intelligatur, persuaserit. Quicquid enim mouetur, priores semper partes excurrat,
mox secūdas, atq; ita deinceps alias oportet, antequā ad metā & instituti cursus cal
cem attingat. Neq; sanē hoc loco Melisi more, instans & momenta excluderim: sed
tanta orbis magnitudine, id quod rationi uehementer repugnat, euenire necesse est,
ut extremæ partes antè præterirent, quā primæ à carceribus promouissent. Est &
hoc quidem in terræ uolutione plenum admirationis: minus tamen habet miracu
li, quòd terra ex cōputatione Eratosthenis trecētis quindecies centena millia pas
suum complectatur, ex quo fit ut horis singulis duodecies & amplius centena millia

Calcagnini made some references to the Pythagorean cosmological theory.

animas sua ipote moueri dixerit, nec a sua circuectione omne motum abstrahere. Sed
lis facile dirimit, q̄ alter motū affectibus, alter locali motu determinauerit. Ad hæc
accedit illa quoq; Pythagoreorum ratio, qua uniuerso *δωδεκαεδρου*, hoc est in duo
decim facies sessilem formam, tribuunt; igni autē, ex quo ætherem & triangulos ui
tæ conseruatores confinxerunt; metæ aut inuersi turbini imaginē; quibus sanè for
mis ad uolutionē peragendam nihil ineptius, nihil minus agitationi consentaneū.
Terram autē & si cubi, id est tessere, forma præfiniant, ob solidam compactamq; na
turam; tamē decedentibus angulis multo facilius circinari potest, & in mobilē orbē
concitari. nam quod paucissimas habet bases, hoc ocysimū esse geometrarū etiam
testimonio dijudicatū est; quod & priscorum autoritas confirmat. Siquidem quod fa
cile ac sponte sua illabitur, id magis uersatile tessera, hoc est, *κύβη δυμιπελολώτορον*,
ueteri prouerbio dicebatur. Cæterum quòd non uno ac perpetuo motu terra con

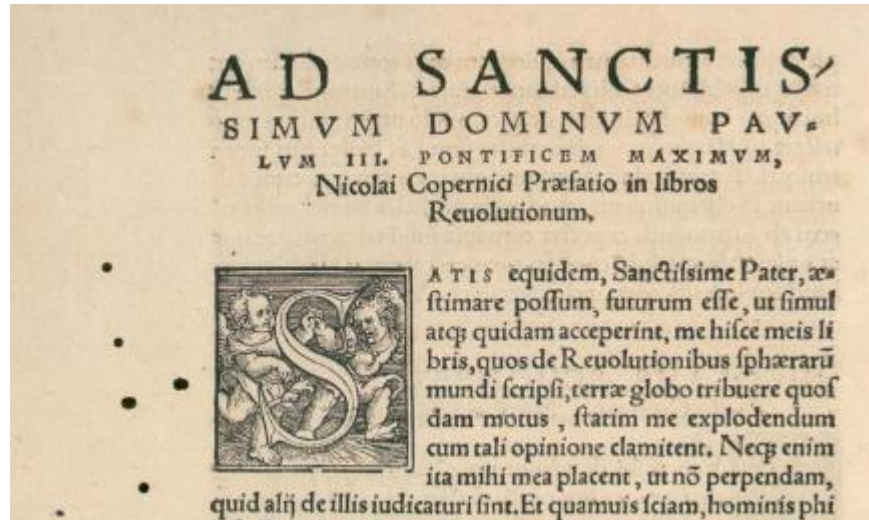
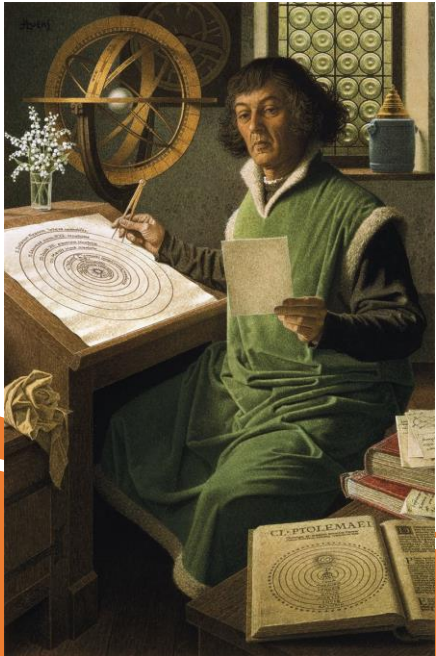


The Pythagoreans attributed the shape of a dodecahedron to the universe, and to fire that of a pyramid.



Heraclitus dixit, neq; nostrae huic sententiae desunt sua numina, suiq; adsertores. Nam & Archimedes Syracusanus recepit se terram architectonica arte alium in locum ducturum, si modo basem in quam transferretur inuenisset. Quam profecto sponsionem nunquam uir grauisissimus iniisset, nisi terram mobilem existimasset. Nicetas & ipse Archimedis popularis, caelum, solem, lunam, stellas, supera denique omnia stare censet: neq; praeter terram rem ullam in mundo moueri: que quom circum axem se summa celeritate conuertat & torqueat, eadem effici omnia, quae si stante terra, caelum moueretur. Atq; hoc etiam Platonem in Timaeo dicere quidam arbitrantur, sed paulo ob-

Nicetas of Syracuse stated that the earth, put at the center of the universe, moves around its axis along a circular trajectory, while the heaven, the sun, the moon, the stars and all the other superior things stand still.



Mathemata profiterentur. Ac reperi quidem apud Ciceronem primum, Nicetum sensisse terram moueri. Postea & apud Plu-

MOTU TERRAE 395
 Quom diu perquisitum foret à priscis philosophis, unde aether nomen accepisset
 & eorum aliquot ἀπὸ τοῦ αἰθέρου, id est ab excurrento: alij uero ἀπὸ τοῦ αἰθέρου διέπαι, hoc
 est à calcaciendo dictum existimassent: Empedocles quasi honorarius arbiter inuo-
 catus, pro ijs stetit, non qui motum, sed qui aetheri calorem tribuissent. Sic quoq;
 non desunt, qui terram, non quòd teratur, sed quòd ipsa perenni excursu cætera te-
 rat elementa dictam suspicentur. Audio & proximo seculo magnæ doctrine ac per-
 spicacis ingenij uirum Cusam purpura quidem præstantem, sed multo literis præ-
 stantio rem, pro hac opinione stetit: cuius utinam cõmentarij in manus meas per-
 uenissent. Quo enim fuit uir ille ingenij acumine, aut me prorsus labore hoc leuaf-
 set: aut mihi, puto, ad hanc sententiam comprobendam multo maiora ac meliora ar-
 gumenta suppeditasset.



Nicolaus Cusanus
(1401-1464)

The ancients did not come to these truths because they
 lacked learned ignorance. But it is now clear to us that this
 Earth is really moving, even if we do not feel its
 movement.
 De Docta Ignorantia, cap. XII

Liber populi sive Nicolai de Cusa 1468
 De docta Ignorantia
 Deo amabili reuerendissimo patri Dno Iuliano sancte
 aplice sedis dignissimo Cardinali preceptor suo metudo
 Dilectissime et vere maxime tua et tam, platis
 simi ingenij quid sibi hoc uelis. Quia diu me
 us barbaricus in episcopi manus parde atque
 te arbiter eligo. quasi tibi pro tuo Cardia
 latus officio apud aplice sedem in publicis
 gravis negotij occupatissimo alioq; oris sup
 se, et post omni latior scriptura q; hactenõ claruerit summa
 notitia et nunc grecis ena ad mei istu fortasse copiosum
 receptu tuique nouitate tuique possis. qui tibi qual ingenio
 sim ia dudu non sum. castro Sed her admiraao no q; pus
 cogniti her in seculi putes. sed potius qua audacia ad de
 docta ignõna turbari idu uimus sim. ainy tua fuerit pau
 du spero uisendu allate. ferunt em nales appetiti qua
 dam trise consilio: in summi dextera auerit. ut sic na
 que seripam consensu: natiue similitate uisitat. Ita uic
 puto admittat. pper qd phan factu desideru puenit.
 ut intellectus tuo nudiage est esse studio ueritatis pñat.
 Rati quid et si mofu sit nos moue sciam. Quamobre
 preceptor. uice pro tua humanitate aliqd digni her latitare
 existico: et ex gmano in rebo diuis tale qlem ueritadu
 modu suscipe. que ni labor ingens admodu gressum ferit.
 Quomo sane est ignõna. Capitulum primum
 uino mune oibus in rebus natiue quoddã def
 deni misse copiam. ut sint melior quid me
 quo hoc causis natiue patitur conditio. utq; ad
 huc sine operi in seculum habe opotia. qd uidi
 au conatã est conueniens. pposio cognoscere. ne sit frustra
 appetitus et inamato potide pcepti natiue quere attinge pos
 sit. Et si fortasse serus corrigat. hoc ex accidenti euenire neq;
 se. ut dã in firmis gustu aut opinio nati: sed uita. Qua
 obit sani liber intellectu. uerõ q; in seculum indito disur
 su curia pelustrando attinge cupit. apphenã amotio am
 plexu cognosce durãno dubitãtes uerissimõ. et tui ois serua
 neci nate dussio. Sed at uerissimõ. in cognosce pñi ppositi
 ceti. ppositi nati ueritãtis. natiua ueritãtis. et ois natiua
 natiua ppositi ueritãtis. ut dã her huc natiua. pñi ppositi
 redunatõ pñi ppositi possit copari sane est appetitõ.

Calcagnini's paper draws its small strength from a long-held suspicion that the most obvious appearances of the movements of the largest bodies in the universe, captured from the narrow observation point of the Earth, are deceptive and illusory and that good reasons can be found not to rigorously demonstrate that all accepted points of view - those of stillness and movement - must be overturned, but at least to practice doing so.

[Bacchelli 2017]

Thanks for your attention

