Copernicanism and the Catholic Church in early 1600

Old science and New science in context

Outline

- Copernicanism in early modern Europe: a complex issue
- Galileo Galilei, Copernicanism and the Catholic Church
- Old science and new science: what was at stake?

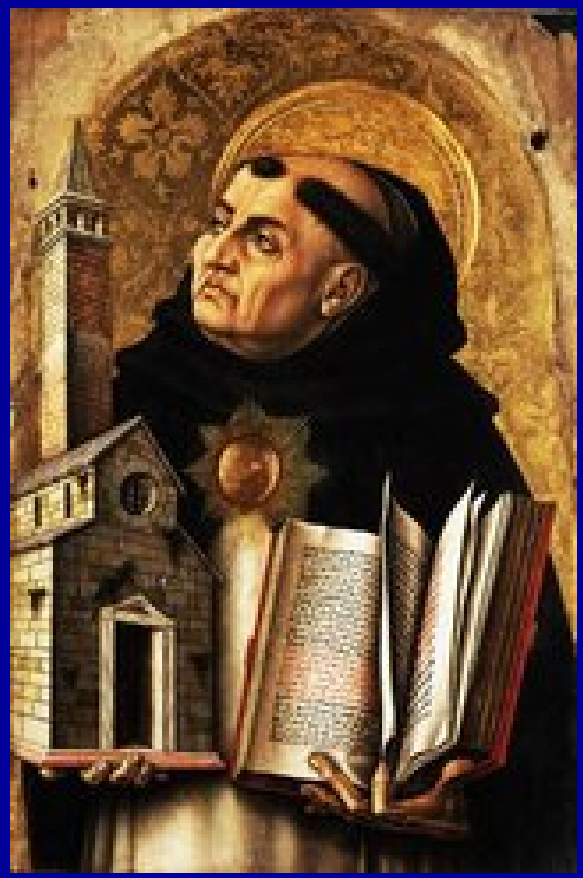
Old cosmology: a mix of Bible and Aristotle

- Geocentrism
- The earth does not move
- The ‘heavens’ above the earth are incorruptible
- What is behind this formulation? Nature and theology in the later Middle Ages

Christianity, Aristotle and Plato

Raphael, ‘School of Athens’ (1509-10), Stanza della Segnatura

Thomas Aquinas (1225-1274): the Christianization of Aristotle



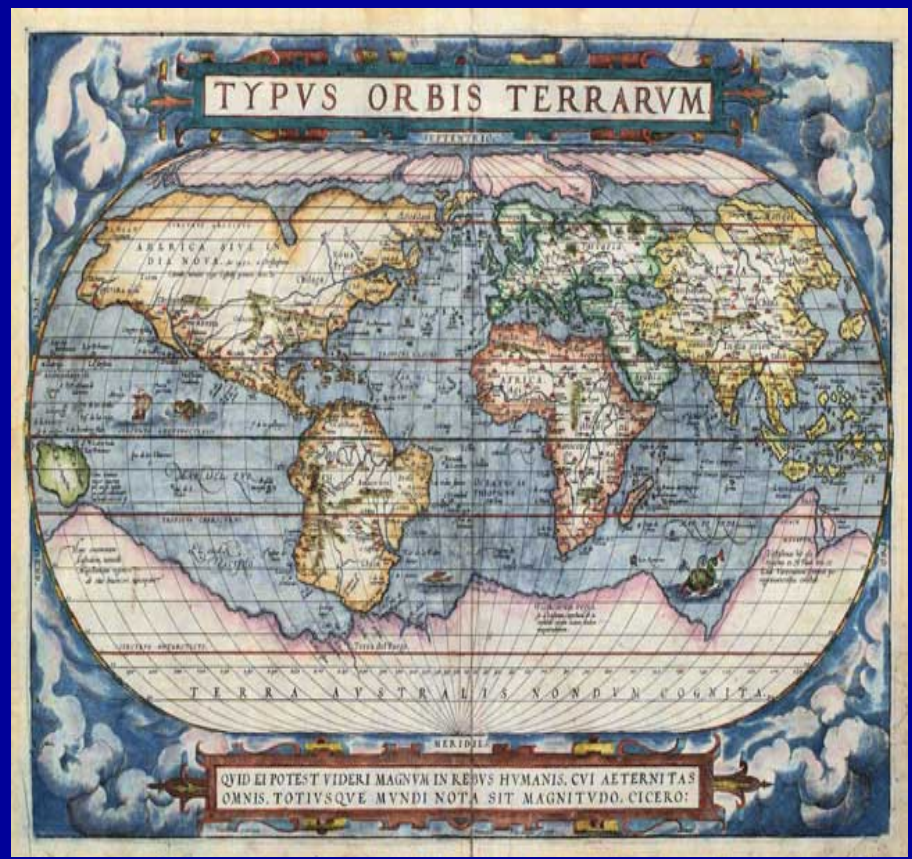
Aquinas by Carlo Crivelli, mid-fifteenth century

Aquinas and the link between faith, reason and nature

‘..although God exceeds all sensibles and senses, his effects, from which the demonstration is taken for proving God exists, are sensible. And thus the origin of our knowledge in sense holds even when what is known exceeds sense’ (introduction to the proof of God’s existence from the ‘Summa contra Gentiles’)

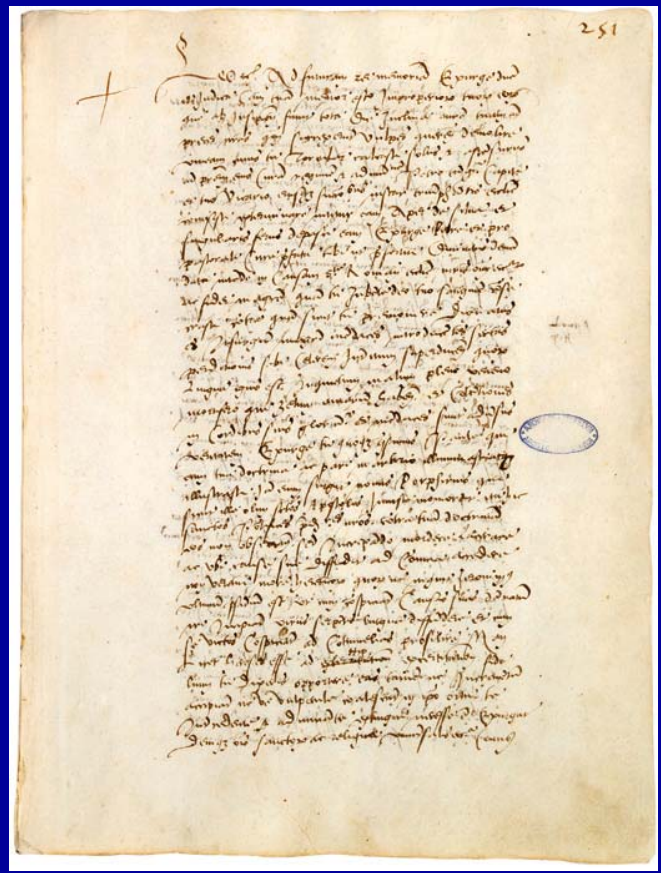
1492: the earth is not that small

World map, Brescia, 1483 ca.



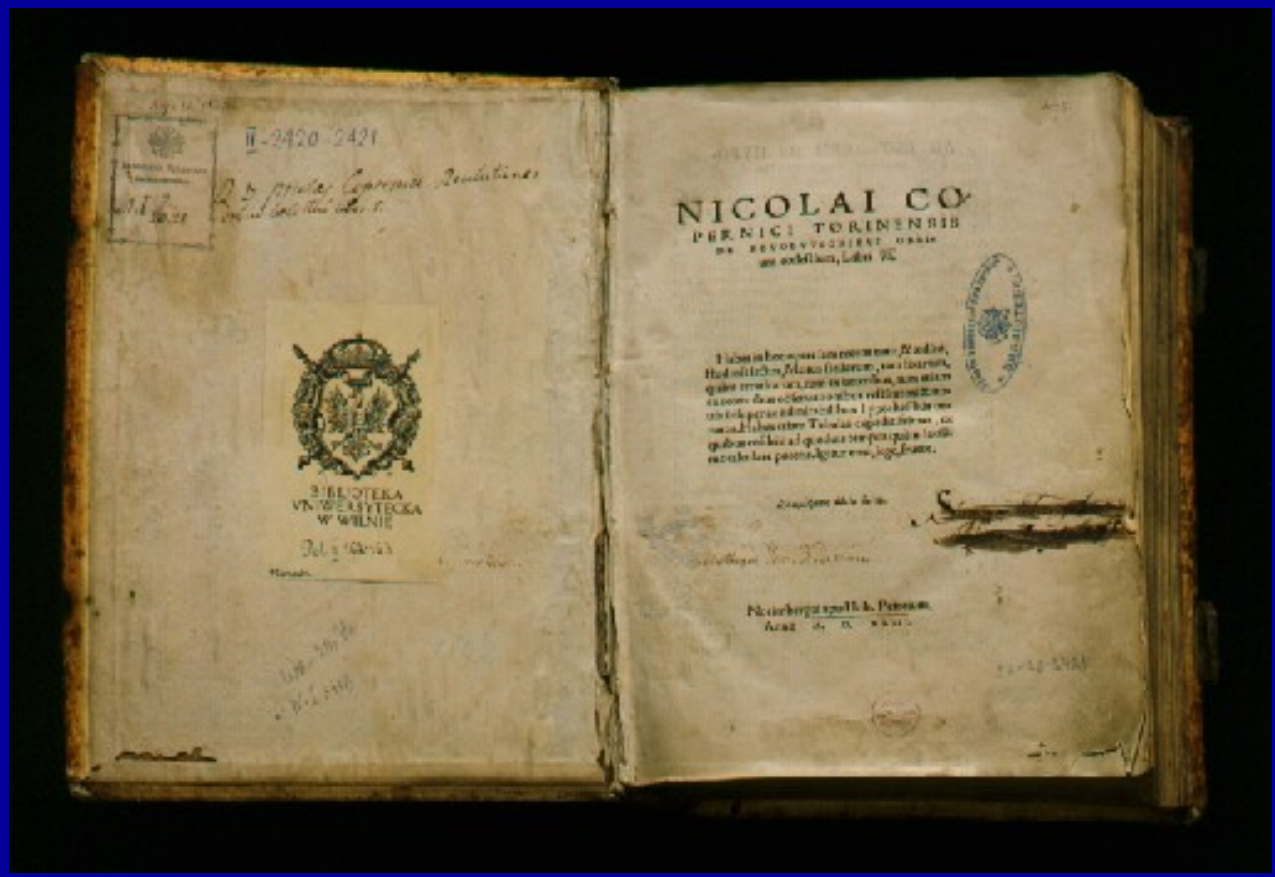
World map, Amsterdam 1570

1517: earth (and heaven) turned upside-down



Text of the Bull ‘Exurge Domine’, with which Luther was excommunicated by the Pope, 1520, Vatican Library

Nicholaus Copernicus: the earth is not the center



Nicholaus Copernicus's *De Revolutionibus,* I ed. 1543

The problems with Copernicus's theory:

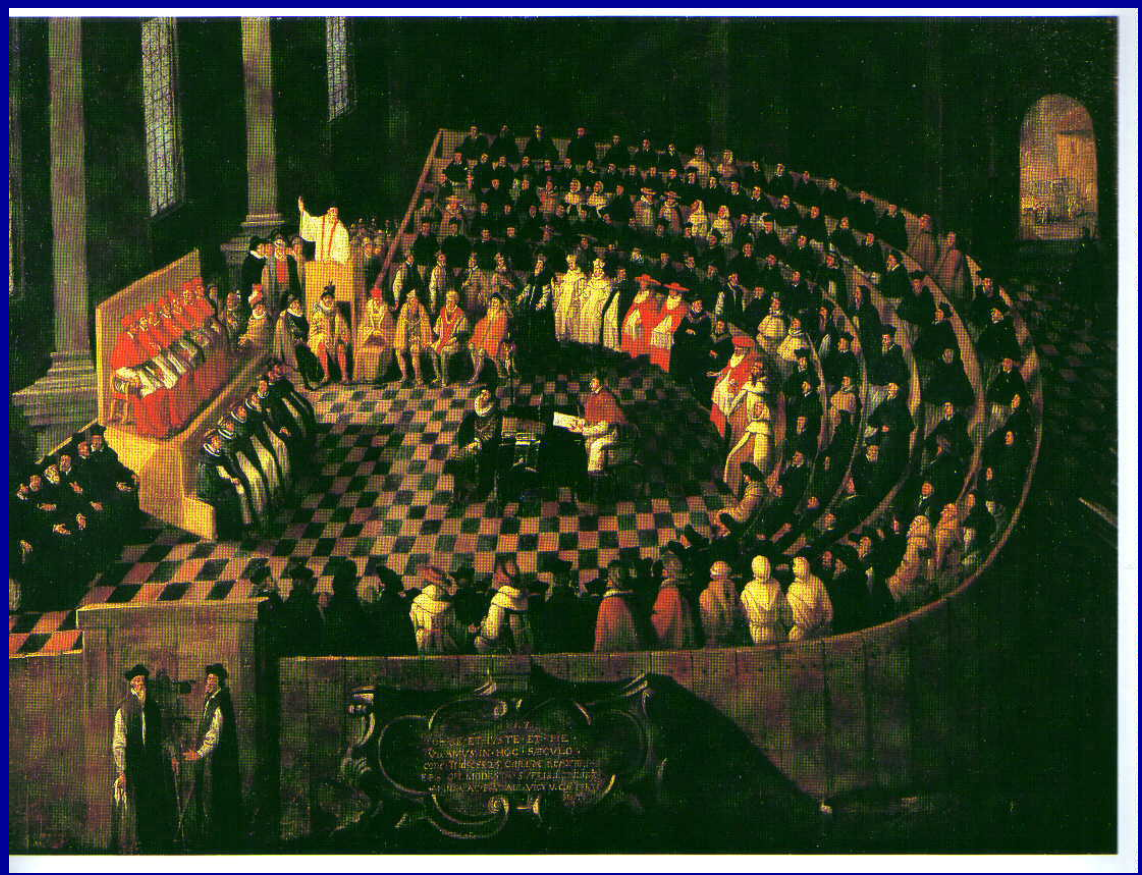
- 'Wrong' theology
- 'Wrong' timing
- 'Wrong' calculations

Wrong theology: ‘the world also is established, that it cannot be moved’ (Psalms, 92:1)

Wrong timing: the Protestant Reformation spreading fast..

Religious map of Europe, ca. 1560s

Wrong timing: the Reformation and the Council of Trent (1545-1563)



Wrong calculations: the orbits

Wrong calculations: the size

Wrong calculations: the problem of the parallax and the phenomenological issue

Parallax first measured by Friedrich Wilhelm Bessel (1838)

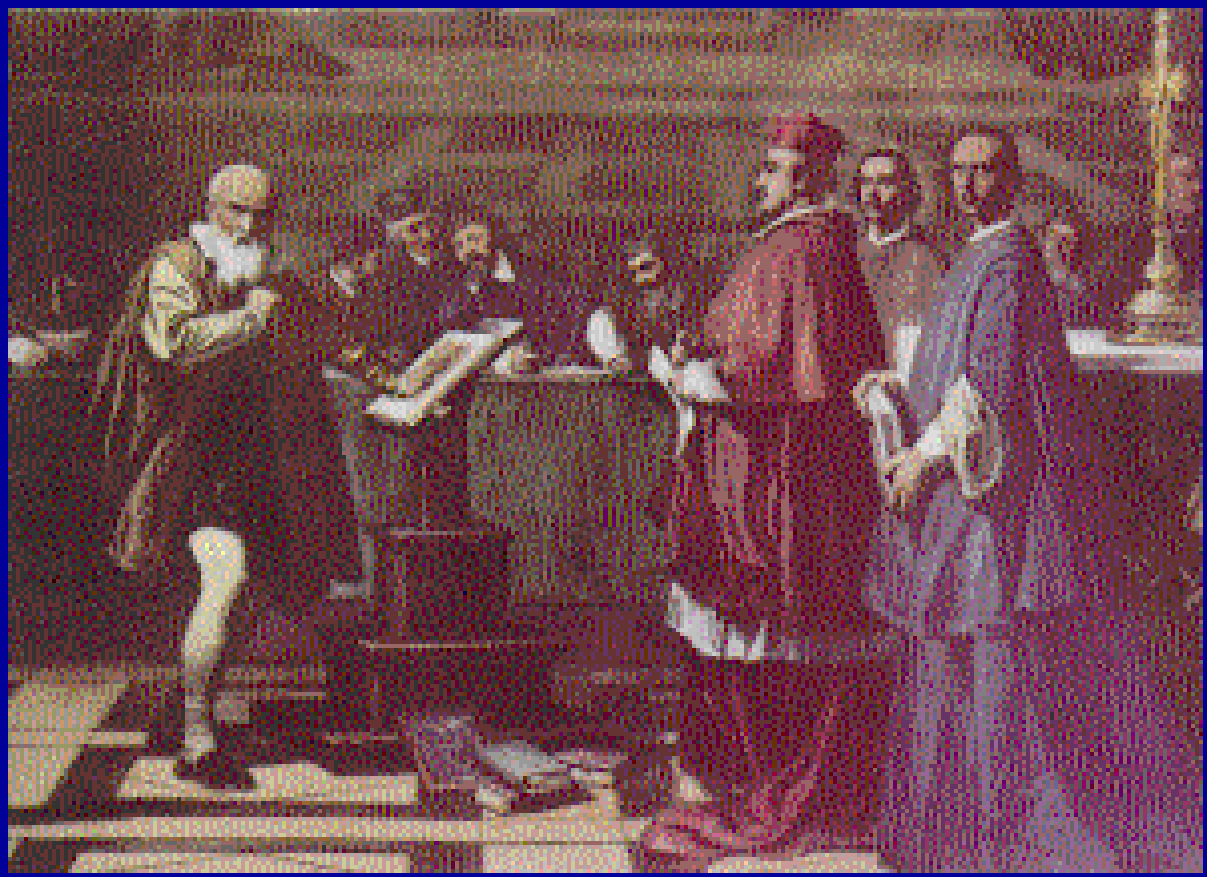
In this context…Galileo's trials (1615-6, 1632-3)

Robert Bellarmine (1542-1621)

Bellarmine's agenda: three points

- 1) Copernicanism is not 'true'
- 2) Saying otherwise will jeopardize the orthodoxy of the Church
- 3) The Church has to be up-to-date and the leader in scientific matters

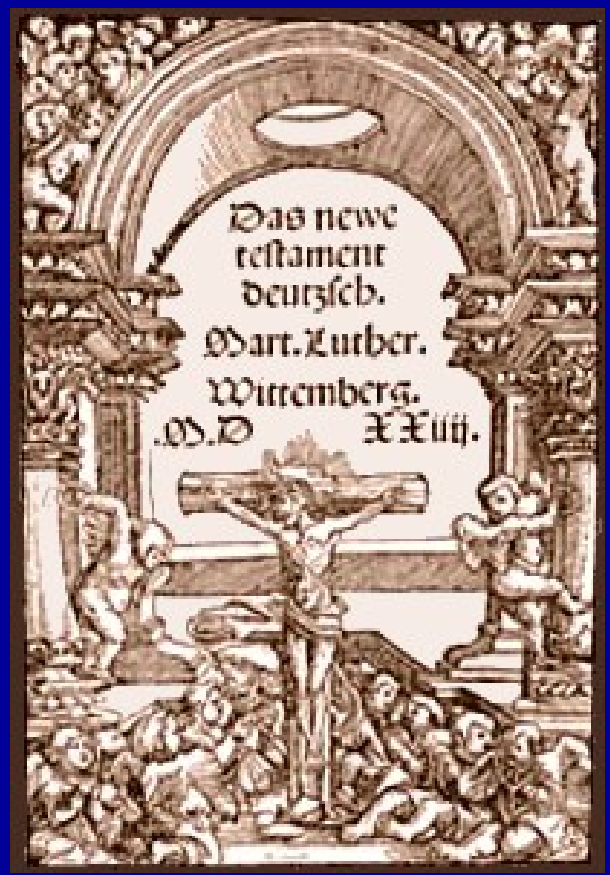
1) Galileo: Copernicanism IS true, ‘eppur si muove’



1) Bellarmine: Copernicanism is not ‘true’

‘…whenever a true demonstration would be produced that the sun stands in the center of the world and the earth in the third heaven … then at that time it would be necessary to proceed with great caution in interpreting the Scriptures which seem to be contrary... But I do not believe that there is such a demonstration, for it has not been shown to me’ (Bellarmino to Foscarini, 12 April 1615)

2) Scriptural exegesis and the orthodoxy of the Church



2) Galileo and Scriptural exegesis

‘it seems to me that it was extremely prudently ..established by Your Paternity that the Sacred Scripture can never lie or err, but its tenets are absolutely and inviolably true. Only I would add that, even if the Scripture cannot err, nevertheless *its interpreters and expositors can err in several ways*, among which a very serious and frequent case is when they would want to limit their interpretation only to *the mere literal significance* of the words’ (Galileo to Castelli 21 December 1613, my italics)

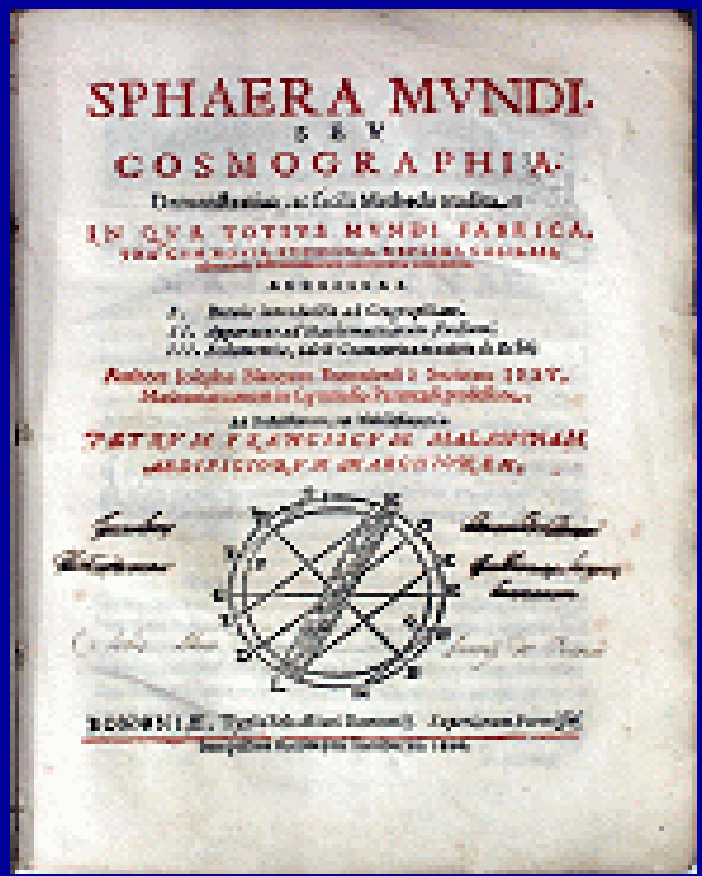
2) Bellarmine and Scriptural exegesis

‘I say that it appears that you (Foscarini and Galileo) have acted prudently in being satisfied with speaking of Copernicanism as an hypothesis…for to say that the assumption that the earth moves..saves all appearances better than do eccentrics and epicycles is to speak well. But to wish to assert that the sun is really located in the center of the world…[is] making the Holy Scripture false…and the Council of Trent has prohibited the interpretation of Scripture contrary to the common agreement of the Holy Fathers’ (Bellarmine to Foscarini, 12 April 1615)

3) Catholicism and the new science: a complex relationship

- Copernicanism: dangerous and NOT ‘true’
- Lunar and Solar maculae? Dangerous (against incorruptibility of the heavens and proved by, among the others, Tycho Brahe , 1546-1601, who was Lutheran) but true
- New measurements of the movement of the comets? Dangerous because their author was Tycho, but true
- So?

1620: Biancani's 'Sphaera Mundi'



SPHAERA MVNDI
SEV
COSMOGRAPHIA
IN QVA TOTIVS MVNDI FABRICA
PETRVS FRANCISCVS DE MALGVINAM

Sphaera Mundi: Thyco and Galileo are right on sunspots and comets!

‘my intention and opinion in this work is first to report the hypotheses of the ancients, commonly accepted, and to pursue them; … nevertheless I do not think that the new observations and discoveries of the moderns should be neglected’ (G.Biancani, Sphaera Mundi)

Thyco, Bellarmine and the Index

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CVM REGVLIS CONFECTIS
per Patres a Tridentina Synodo delectos,
auctoritate Sanctiſs. D.N. Pij IIII,
Pont. Max. comprobatus.

VENETIIS, M. D. LXIIII.

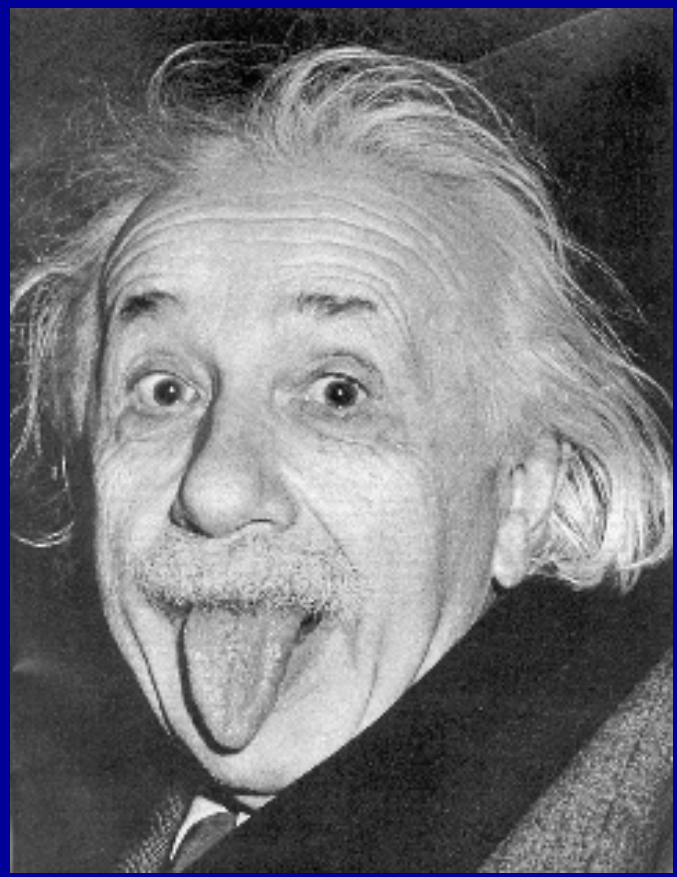
Bellarmine's censure (1620)

- Thyco was a heretic, for he praised Luther and other Reformers in his book. However…
- His children are committed Catholics, so..
- 'Posset fortasse corrigi liber' (maybe the book could be corrected) ! (ACDF S.O. Censurae Librorum II, fasc.13, fol.606r)

Conclusions

- Was Bellarmine wrong on the ‘true’ character of Copernicanism?
- Was Galileo right?
- Was the Catholic Church opposed to science? Opposed to science for science’s sake?

Science and everything else: is God playing dice?



Religion, science and modernity

‘Three great events stand at the threshold of the modern age and determine its character: 1) the discovery of America; 2) the Reformation; 3) the invention of the telescope and the development of a new science that considers the nature of the earth from the viewpoint of the universe’ (Hannah Arendt, ‘The Human Condition’)