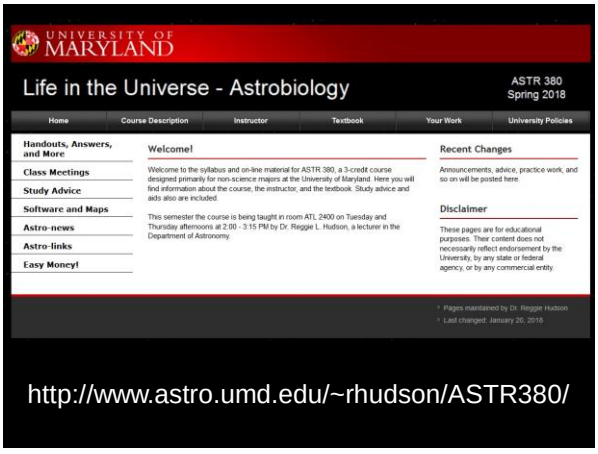
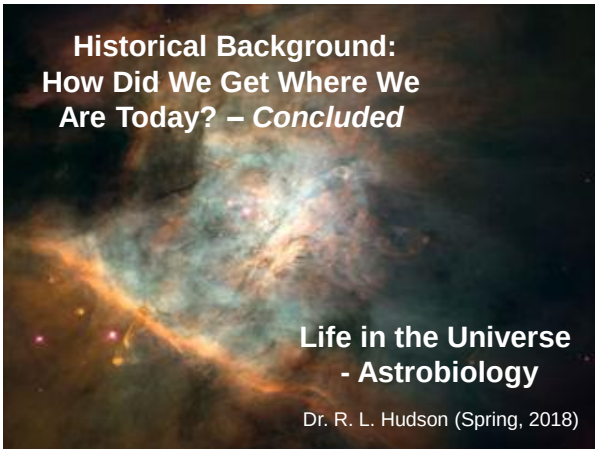


http://www.astro.umd.edu/~rhudson/ASTR380/



The School of Athens

Raphael (*ca.* 1510)

The School of Athens

Plato

Rationalism

Aristotle

Empiricism

Early Observations

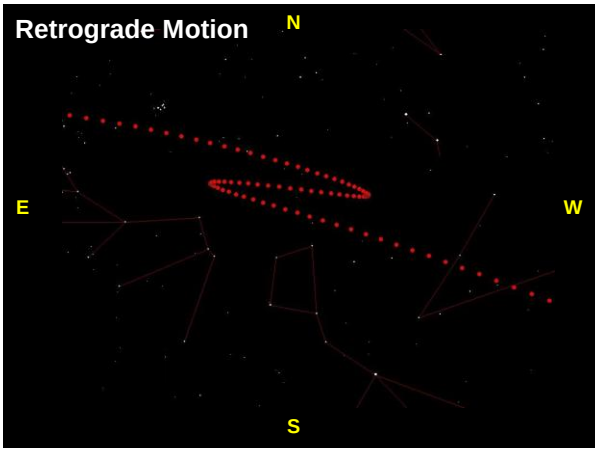
Earth's shape and size

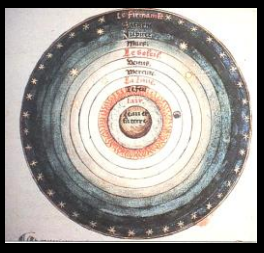
Cycles - daily, monthly, yearly (seasons)

Motions of the Sun and Moon, the stars and the planets

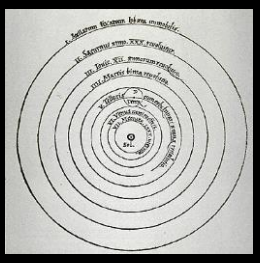
Circumpolar stars

Retrograde Motion





Geocentric System



Heliocentric System

Advantages and Disadvantages?

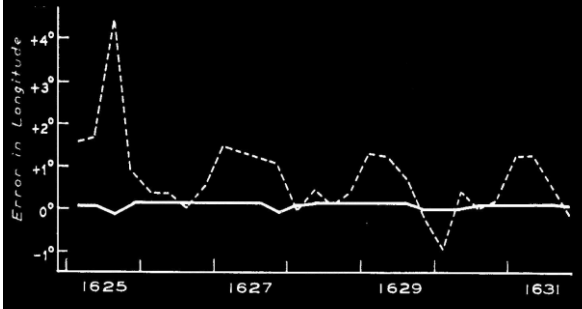
Nicholas Copernicus

Galileo Galilei

Tycho Brahe

Johannes Kepler

Errors in the Calculation of Mars's Orbit

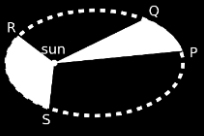


Kepler's Laws and the College Park Science Car

June, 2006

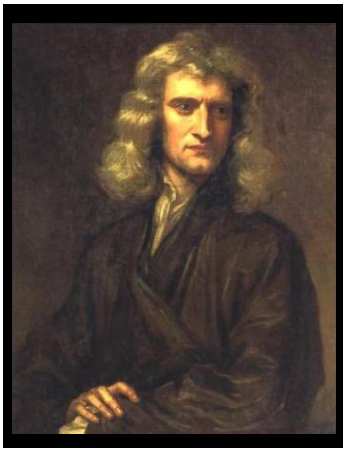
Kepler's Three Laws of Planetary Motion

Orbital shape **not** circular



Orbital speed **not** constant

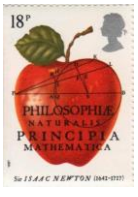
$\frac{a^3}{P^2}$ **is** a constant

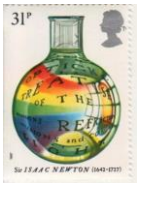


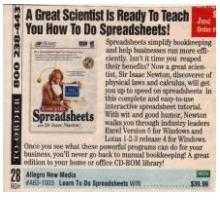
Isaac Newton
1642 - 1727

The Most Influential Scientist of All Time

London **Cambridge** **Singapore**







Newton's Law of Gravity

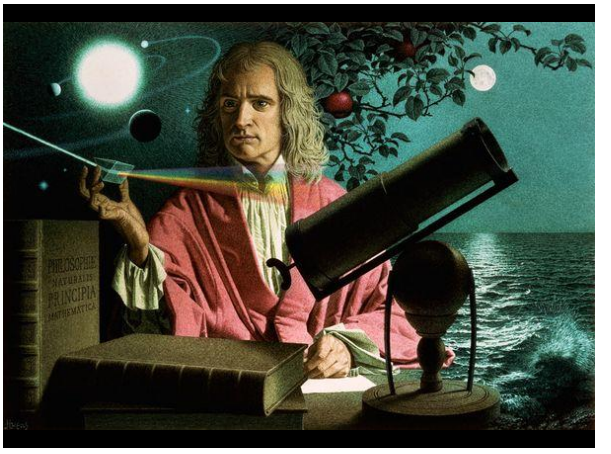
$$F = G\frac{m_1 m_2}{r^2}$$

An Inverse Square Law

Isaac Newton
1642 - 1727

Newton's Law of Gravity

$$F = G\frac{m_1 m_2}{r^2} \quad \Rightarrow \quad \frac{a^3}{P^2} = \frac{G}{4\pi^2}(m_1 + m_2)$$



The End

Sources of Material

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