General: It is convenient to trace the origin of modern astronomy to the rapid pace of new discoveries that took place during the period 1500 - 1700 AD, and in particular to the writings of Copernicus who put forth a model of a Sun-Centered Universe. The events of this period are described below after the names of the people who are credited with the new discoveries:

I. Nicholas Copernicus (Polish; 1463 - 1543)
   Postulated a model of a Sun-centered (Heliocentric) Universe.

II. Tycho Brahe (Danish; 1546 - 1601)
   Gathered extensive data on “wandering stars”, initially for the purpose of refuting the Heliocentric theory.

III. Johannes Kepler (German; 1571 - 1630)
   Tycho’s assistant who interpreted Tycho’s data and used it to develop 3 Laws of Planetary Motion:
   
   Law 1: Planets move in ellipses with the Sun at one focus.
   
   Law 2: The line joining the Sun and a planet sweeps out equal areas in equal times.
   
   Law 3: The square of the period of revolution is proportional to the cube of the semi-major axis of the ellipse.

IV. Galileo Galilei (Italian; 1564 - 1642)
   Manufactured the first optical telescope (only 2-inch diameter lens !), and used it to observe the phases of Venus as well as the motion of the moons of Jupiter. These observational data provided a powerful confirmation of the Sun-centered model of the Universe.

V. Isaac Newton (British; 1642 - 1727)
   Published The Principia in 1687 (Mathematical Principles of Natural Philosophy) which revolutionized our understanding of the motions of astronomical bodies by showing that these motions could be understood in terms of the law of gravity.

   Law of universal gravitation: \[ F = \frac{G \times M_1 \times M_2}{D^2} \]

   where F is the gravitational force (of attraction) between two masses \( M_1 \) and \( M_2 \). This law states that the gravitational force \( F \) is equal to the gravitational constant \( G \) multiplied by the product of the two masses \( (M_1 \times M_2) \) divided by the square of the distance between them \( (D^2) \).