June 4th

Tycho Brahe is likely the first Astronomer (and arguably the first scientist ever) of the Renaissance. That is because he used measurements and logic to bring down the Aristotelian solar system—sun revolves around the earth—but Galileo Galiei often gets the credit. There was no such occupation as 'scientist' in those days. Galileo was an accounting professor at Padua with a hobby of looking at the heavens. The object that allowed him to do this was a telescope that magnified with 100X power, the best instrument of its day.

He was born in Pisa, Italy the day Michelangelo died (FB 18, 1584) and the same year Shakespeare was born. His father had the same name, so in today's parlance he would have been "Junior". His observations of Jupiter showed 4 moons, and since they were small compared to the planet, he thought the Earth went around the much larger Sun in the same manner. There were two troubles with this. First, theologian Thomas Acquinas had stated in the 1100s that either God's word or reason could lead to Truth. Following this, the Dominican order or Scholastics, the leading order comprising most university professors, held that reason had given Aristotle, a pagan Greek, the correct answer that the sun revolved around earth. No need to investigate; the answer had already been discovered. And what the Dominicans held was accepted as true by the church. Declaring anything contrary could lead to being declared a heretic and getting executed. Secondly, the Inquisition, an investigative body to determine heresy was begun in Italy and Spain. hus, while Protestants in the north stayed out of the discussion or even encouraged exploring new ideas, the Catholic south was an altogether different regime. Even Polish Copernicus, sensing that his ideas on a sun-centered solar system would not be well-received, arranged for his treatises to not be published until after his death. Brahe, by careful measurement of a comet had proven that the Dominican story of transparent rolling spheres guiding planetary and sun's motion was quite untrue. But news traveled slowly in those days. Galileo, by his telescope brought Sun-centeredness to the public's attention. When other professors at Padua refused to even look through the telescope, Galileo, respected tenured professor, decided maybe it was time to get out of Dodge and go to Florence instead.

In 1615, Galileo was charged with contradicting the Bible in a formal protest to the Inquisition. To answer his critics, Galileo went to Rome, hoping to convince Cardinals and Pope of his point of view. Soon the whole city was discussing astronomy. But he was unsuccessful and the Inquisition demanded he abandon his opinions and not discuss them further (1616). To avoid prison, Galileo submitted to the decree. He went back to teaching double-entry accounting for over a decade but was writing a book on astronomy on the side. When it was published in 1632, the Inquisition accused him of back-sliding. So again, Galileo recanted. It didn't work. The Inquisition found him guilty of heresy and sentenced him to prison. Fortunately, a kindly pope agreed to let him serve his sentence as a prisoner of his own villa. There he was free to continue his astronomy, discovering the rings of Saturn, while his daughter, a nun, recited the penitential psalms for him.

But a funny thing happened on the way to being discredited. Beginning in 1605, a brilliant, young German Lutheran scientist, Johannes Kepler, published the first of his 3 laws on planetary motion. By 1618 he had published all 3 mathematical principles that exactly described all planetary and thus explained why Earth had timing perturbations as it went around the Sun. Earth too was a planet. This convincing proof took the astronomical world by storm, and belatedly shamed Rome into claiming that they had actually meant to support dear Galileo. Galileo died 1642, on the same day that another scientist, Isaac Newton, was born in England.

Newton went on to show how Kepler's planetary motion laws derive from Newton's gravitation theory. What impelled these Protestants to explore the world? Luther taught that reason can fail and won't lead to salvation. God resides in mystery and gives His Holy Spirit in mystery (John 3!). Yet we know the world around us is often quite predictable. Hence God has created a world of unknowns, but sets us free to go hunting for the principles.