**Topic:** Marin Mersenne

**Notes on Topic:** Mersenne was born into a working class family, in Oize, Maine, France in 1588

Despite financial strife, his family managed to send him to grammar school and later to the newly Jesuit School in La Fleche which was set up as a model school to benefit all children regardless of their parents income

Later, it was discovered that DesCartes, who was eight year younger, attended this school at the same time

Mersenne’s father wanted him to work for the church, but Mersenne was devoted to his studies and decided to further his education in Paris

He finished his studies in 1611, and then decided to devote his life to the monastery

He spent much of his life devoted to the Order, he remained in Paris at the Place Royale monastery until he died in 1648

From the beginning of his time in Paris, mathematical problems played an important role in his life.

France was going through a period of anti-witchcraft

It was during this time that Mersenne started to think about the theological criticism directed toward DesCartes and Galileo

*“Mersenne was central in the new mathematical approach to nature”*

Mersenne began to realize he was interested in science as well as religion, and in particular, mathematics.

Mersenne believed that without mathematics, there would be no science

Mersenne had a philosophical approach to mathematics

He started to become a coordinator for all European scholars, his regular correspondents: Gassendi, DesCartes, Fermat, Hobbes, Etienne Pascal, Blaise Pascal

He set up meetings with scholars to read and review scientific papers, exchange contacts, and plan and discuss experiments

Mersenne delved into the world of music as well, researching acoustics and the speed of sound

In one of his works, he was the first to publish the laws relating to the vibrating string; its frequency is proportional to the square root of the tension, and inversely proportional to its length, to the diameter, and to the square root of the specific weight of the string

Mersenne was a huge support for many scientists.

Huygens worked under his wing, and through Mersenne’s encouraging letters, Huygens wrote *Theory of Music*

Galileo had reason to thank Mersenne, for Mersenne was responsible for making his work known outside of Italy

Mersenne insisted on publishing Galileo’s work, without this his ideas may not be as widely known

Mersenne fell ill after a visit to DesCartes, and he never recovered

He died eight days prior to his 60th birthday

He never gave up on his lifelong desire to advance science, and he even left a note in his will that he wanted to leave his body to be used for scientific research

Letters from 78 correspondents were found after his death.

They were later published in what looks like an international review of mechanics

Through all of his correspondents and communication, Mersenne knew everything that was happening in the world of science, and only wanted them all to work together in advancing science

Mersenne studied in depth the cycloid, he gave this definition,

Cycloid: the locus of a point at distance *h* from the center of a circle with radius *a*, that rolls along a straight line

He intended to find the area under the cycloid curve using integration, but failed. In 1638 Roberval had indeed found the area under the cycloid

Mersenne is most remembered for his work studying prime numbers

He tried to find a formula for prime numbers and ended up with: If is prime, then p is prime.

Mersenne undertook experiments to test Galileo’s law of motion for falling bodies

He tried to solve whether acceleration was continuous as Galileo thought, or discontinuous as DesCartes believed.

He also did work examining permutations and combinations. He states practical rules for calculating the two.

Mersenne spent the last four years of his life investigating barometer. He found that the density of air was approximately th that of water (after Pascal had already proved that air was not weightless).

One question still remains, how did Mersenne pursue his scientific ideas freely at a time when the church moved to prevent such discussion?

*During the first half of the seventeenth century, debate over the Copernican hypothesis had spread beyond the ranks of astronomers and had stirred up so much controversy that the Church decided to intervene. In* 1616 *a theological examining body concluded that the idea of the earth's motion was philosophically false and in conflict with the Scriptures, and it suspended Copernicus's book until corrected. Historians have generally assumed that this decision and the subsequent condemnation of Galileo had such a devastating effect that scientific progress in Catholic countries was greatly retarded. However, the attitude of Mersenne, who was both a faithful member of a religious order and a central figure in the development of French science, does not support such a conclusion. An examination of Mersenne's reaction to Copernicanism indicates that no matter how disturbing the Church's decision, it was still possible, at least in France, to study Copernican ideas and to find them useful, despite some reservations. Mersenne was affected by such decisions of the Church, but less so than one might suppose.*

**Source:** http://www-history.mcs.st-andrews.ac.uk/Biographies/Mersenne.html

**Additional Suggested Reading**: None

**Assignment:** Homework 5, Prove “If is prime, then *p* is prime.”