

Biographical Encyclopedia of Astronomers

© 2007 Springer

Grimaldi, Francesco Maria

Born in Bologna, (Italy), 2 April 1613

Died in Bologna, (Italy), 28 December 1663

Francesco Grimaldi was a pioneer in lunar mapping and a leading physicist, the discoverer of diffraction. His parents were Paride Grimaldi and Anna Cattani. He entered the Jesuit order

In 1632, he studied philosophy in Parma and Ferrara, and theology in Bologna. After this, he undertook the study of astronomy under another Jesuit, Giovanni Riccioli, who would be his coworker for the rest of his life. Grimaldi held the post of professor of mathematics and physics at the Jesuit college in Bologna for many years

The astronomical work of Grimaldi was closely related to that of Riccioli, who is known especially for his *Almagestum novum*, published in 1651. Riccioli gave a great deal of credit to Grimaldi for the remarkable success of this publication. He especially praised Grimaldi's ability to devise, build, and operate new observational instruments. In 1640, Grimaldi conducted experiments with Riccioli on free fall, dropping weights from a tower, and using a pendulum as a timer. Grimaldi's contributions also included measurements such as the heights of lunar mountains and the height of clouds.

Grimaldi is responsible for the practice of naming lunar regions after scientists rather than after ideas such as "tranquility." With Riccioli, he composed a very accurate selenograph. It was much more accurate than any lunar map up to that time. Across the top is written: "Neither do men inhabit the moon nor do souls migrate there."

This selenograph is one of the best known of all lunar maps and has been used by many scholars for lunar nomenclature for three centuries. Astronomers took turns naming and renaming craters, which resulted in conflicting lunar maps. In 1922, the International Astronomical Union (IAU) was formed and eventually eliminated these conflicts and codified all lunar objects. 35 Jesuit scientists are now listed in the National Air and Space Museum (NASM) catalog, which identifies about 1,600 points on the Moon's surface. This is not surprising, since recent histories emphasize the enormous influence Jesuits had not only on mathematics but also on other developing sciences such as astronomy.

Grimaldi was one of the great physicists of his time and was an exact and skilled observer, especially in the field of optics. He discovered the diffraction of light and gave it its name (meaning "breaking up") He also laid the groundwork for the later invention of diffraction grating. Realizing that this new mode of light transmission was periodic and fluid in nature, Grimaldi was one of the earliest physicists to suggest that light was wavelike in nature. He formulated a geometrical basis for a wave theory of light in his work *Physico-mathesis de lumine* (1666). This was the only work published by Grimaldi himself. However, 40 of his articles are published in the *Almagestum novum*. It was the *de lumine* treatise that attracted

Isaac Newton to the study of optics. Later, Newton and Robert Hooke (both of whom quoted Grimaldi's works) would use the term "inflexion," but Grimaldi's word has survived.

There is a prominent crater on the Moon's eastern limb named for Grimaldi.

Joseph F. MacDonnell

Selected References

Cajori, Florian (1898). *History of Physics*. New York: Macmillan.

Reilly, Conor (1958). "A Catalogue of Jesuitica in the Philosophical Transactions of the Royal Society of London." *Archivum Historicum Societatis Iesu* 27: 339-362.

Sommervogel, Carlos (1890-1960). *Bibliothèque de la Compagnie de Jésus*. 12 Vols. Brussels: Société Belge de Libraire