

(Just a few of the) **Catholics who made major contributions to science** (and who may come up in the science curriculum at some point):

**St. Albert the Great** – the patron saint of the natural sciences, discovered arsenic, did early experimentation in chemistry/alchemy, and experimented with silver nitrate (one of the first known photosensitive chemicals and used in early photographic film).

**Amadeo Avogadro** – studied ecclesiastical law before dedicating himself to physics and chemistry. Came up with what is known as Avogadro's law (relates the volume to the mass of a gas) and has a fundamental constant (Avogadro's number) named after him

**Daniello Bartoli** – a Jesuit astronomer, credited with being the first person to ever see the equatorial belts of Jupiter. Also a renowned preacher.

**Laura Bassi** – A devout Catholic and the first woman in the world to receive a university chair position in a scientific field of study (Newtonian physics), the first woman to earn a professorship in physics in Europe, and the first woman to be offered an official teaching position at a university in Europe

**Henri Becquerel** – one of the fathers of nuclear physics and the first to discover radioactivity. He was also the grandson of Antoine Becquerel, another world changing Catholic scientist. He worked closely with Marie and Pierre Curie and has the SI unit of radiation (the Becquerel, BQ) named after him

**Giovanni Cassini** – an astronomer and engineer. Most notably he discovered the separation of the rings around Saturn (known as the Cassini separation), and discovered four of Saturn's moons. The NASA Cassini probe currently studying Saturn is named after him. His work also included the first topographic map of an entire country (France). He also worked for Pope Clement IX fortifying Perugia and implementing flood mitigation on the river Po. Pope Clement IX personally invited him to become a priest, but he elected to remain a lay person so he could fully dedicate himself to astronomy and the scientific revolution.

**Nicolaus Copernicus** – the father of heliocentrism, one of the most important contributions to astronomy in history. As much as his discoveries and model of the solar system were controversial for many years and presented a major theological challenge to the church, he was a faithful Catholic and was held in high regard by many archbishops and cardinals. He dedicated his masterpiece of heliocentrism to Pope Paul III. His brother became an Augustinian Canon, his sister became a Benedictine Prioress, and he was a Canon Lawyer.

**Rene Descartes** – Well known for developing analytical (Cartesian) geometry and the Cartesian coordinate system, Rene Descartes was a foundational western mathematician. Despite some of his philosophical writings being used in arguments against religious belief, Descartes considered himself to be a devout Catholic and despite opposition at the time, worked to ground the Catholic faith in logic and reason, and wrote two proofs of God's existence.

**Galileo Galilei** – called the father of observational astronomy, the father of physics, the father of science, Galileo is best known for championing Copernicus' model of a heliocentric solar system, and the controversy and persecution that followed. This is also a very poorly understood and often miscommunicated set of events. While there was some theological opposition to heliocentrism, Copernicus and later, Galileo had adamant supporters within church structures all the way up to the Vatican. One of Galileo's main opponents was the scientist Tycho Brahe, who's student Johannes Kepler would later revise Galileo's model of orbital motion to the more accurate elliptical one we use today. In the initial charges against Galileo 18 of the arguments made against him were mathematical and scientific, many written by Brahe, and only 4 were theological. After his initial trial with the inquisition, Galileo was encouraged about 10 years later to publish his work by Cardinal Barberini who had recently been elected Pope (Urban VIII). Pope Urban VIII was a friend of Galileo and had opposed his persecution in the initial inquisition. However, due to political issues at the time, and what was perceived as personal and public attacks against Pope Urban VIII in his book, Galileo lost the support of Pope Urban VIII and was sentenced to house arrest. Despite his persecution, Galileo remained faithful to the church and had positive relationships with other clergy including the Archbishop of Siena. After dying, Galileo was buried in a small room in the Basilica of Santa Croce, and about 100 years later was moved to the main body of the Basilica where a monument in his honor had also been erected.

**Antoine Lavoisier** – Lavoisier is the father of modern qualitative chemistry. He discovered the role of oxygen in combustion and named oxygen and hydrogen. He also helped invent the metric system and contributed to the law of conservation of mass. Because he was part of the French nobility during the French Revolution, Lavoisier was sentenced to death by guillotine in 1794.

**Georges LeMaitre** – LeMaitre was a Belgian Catholic priest and university physics professor. He was the first to propose the big bang theory, and he proposed the theory of the expansion of the universe (often misattributed to Edwin Hubble). He was also the first to calculate what is now known as Hubble's law and estimate the Hubble constant.

**Gregor Mendel** – an Augustinian Friar who became known after his death for being the father of modern genetics. His experiments in the monastery gardens established the rules of heredity and coined the terms 'dominant' and 'recessive' when describing genetic traits

**William of Ockham** – A Franciscan friar best known for a scientific philosophy known as Occam's razor, which states that if there are multiple competing hypotheses in an experiment, the one requiring the fewest assumptions is most likely correct and should be tested first.

**Louis Pasteur** – A French biologist and chemist. His discoveries contributed significantly to the germ theory of disease, and he discovered the principals of vaccination and pasteurization. Despite commentary which suggest Pasteur was spiritual rather than religious, in the most comprehensive biography of his life, written by his son in law, it was written: "Absolute faith in God and in Eternity, and a conviction that the power for good given to us in this world will be continued beyond it, were feelings which pervaded his whole life; the virtues of the gospel had ever been present to him. Full of respect for the form of religion which had been that of his forefathers, he came simply to it and naturally for spiritual help in these last weeks of his life."

**Alessandro Volta** – An Italian physicist and chemist credited with the invention of the electric battery (the Voltaic pile). The SI unit Volts are named after him. Despite rumors that he rejected the Church because he didn't become a priest, Volta himself defended his faith:

I do not understand how anyone can doubt the sincerity and constancy of my attachment to the religion which I profess, the Roman, Catholic and Apostolic religion in which I was born and brought up, and of which I have always made confession, externally and internally. I have, indeed, and only too often, failed in the performance of those good works which are the mark of a Catholic Christian, and I have been guilty of many sins: but through the special mercy of God I have never, as far as I know, wavered in my faith... In this faith, I recognize a pure gift of God, a supernatural grace; but I have not neglected those human means which confirm belief, and overthrow the doubts which at times arise. I studied attentively the grounds and basis of religion, the works of apologists and assailants, the reasons for and against, and I can say that the result of such study is to clothe religion with such a degree of probability, even for the merely natural reason, that every spirit unperverted by sin and passion, every naturally noble

spirit must love and accept it. May this confession which has been asked from me and which I willingly give, written and subscribed by my own hand, with authority to show it to whomsoever you will, for I am not ashamed of the Gospel, may it produce some good fruit!

This is only a very short list of some of the most famous Catholic scientists. There are many more clergy who made major contributions not only to specific scientific discoveries, but the invention of science itself: [https://en.wikipedia.org/wiki/List\\_of\\_Catholic\\_cleric-scientists](https://en.wikipedia.org/wiki/List_of_Catholic_cleric-scientists)

There have of course also been countless other Catholic lay people who have made major contributions to scientific knowledge: [https://en.wikipedia.org/wiki/List\\_of\\_Catholic\\_scientists](https://en.wikipedia.org/wiki/List_of_Catholic_scientists)

It is also important to note that there are still many clergy worldwide working in the sciences.

Some who are notable include **Brother Guy Consolmagno**, an astrophysicist, the chief Vatican astronomer, the recent chair of the Division of Planetary Sciences and the American Astronomical society, and the winner of the 2014 Carl Sagan Medal for outstanding communication by an active planetary scientist to the general public. There is an asteroid named after him. His predecessor at the Vatican was **Fr. George Coyne**, another priest astronomer who is still active in astronomical research at the Vatican's observatory in Arizona. There is also **Father Nicanor Austriaco** who studies cellular death and the spread of cancer. Finally, I'd like to highlight **Sr. Katarina Pajchel**, OP. She is a research scientist on the ATLAS project at CERN, which is one of the most complex scientific projects and largest physics collaborations ever undertaken. It was instrumental in the discovery of the Higgs Boson.