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## Teaching Modern Attitudes through Science of the Past: Hypatia of Alexandria

### Introduction

In this article we present a remarkable woman scientist from the late 4th and early 5th century AD, whose life, activities and achievements even though from so many centuries ago, teach us attitudes pertaining to our modern life. An extraordinarily gifted woman, Hypatia of Alexandria was in her time the greatest mathematician and astronomer, also a philosopher and a charismatic teacher. In a male-dominated world, she outpaced the prevalent gender standards thanks to her talents, strength, independence and courage. Apart from femininity, her attitudes included religious tolerance, high moral standards, social and educational activity and political temperance, all of them appropriate for teaching in today's schools. Hypatia died tragically murdered by Christians in Alexandria. Unfortunately, all of her writings were lost, and her life, although partly distorted by legends, is primarily reconstructed from the contemporary correspondence of her students.

### Life of Hypatia of Alexandria

Hypatia was born in the 4th century AD in Alexandria, Egypt, then part of the Eastern Roman Empire. She lived her whole life there, which was fortunate and as will be argued later, unfortunate for her.

Fortunate because Alexandria was a special place. Founded by Alexander the Great in 331 BC it soon became a thriving centre of knowledge, learning and scholarship spanning all disciplines of human life and activity, from science, medicine and philosophy to literature and art – a centre radiating over the whole Hellenistic world. The city boasted the Mouseion (the Museum in English, meaning the house of Muses), that was the greatest centre of scholarly work in the ancient world and the meeting place of the most brilliant minds of the time. The central part of the Mouseion was the great library that housed between 40,000 and 400,000 scrolls at its height. The Mouseion also had an astronomical observatory and botanical and zoological gardens in addition to lecture halls and classrooms. In the Roman times the Mouseion was in decline and Hypatia's father, Theon of Alexandria, a mathematician and philosopher is said to be its last head before it was closed down

on the decree of the Roman emperor Theodosius the Great in 391 AD (*Hypatia – Lover of Wisdom*, <https://justine.durrell.net/hypatia-lover-of-wisdom/>, Zielinski S., *Hypatia, Ancient Alexandria's Great Female Scholar*, <https://www.smithsonianmag.com/history/hypatia-ancient-alexandrias-great-female-scholar-10942888/>).

The year of Hypatia's birth is not certain. It is estimated to be around 355 AD. She received her education from her father and consequently grew to be a highly-educated scholar in mathematics, astronomy and philosophy, remarkably, a female scholar in a male-dominated world. Her works have not survived till today, but it is known that she collaborated with her father and wrote numerous original commentaries on important works in geometry and astronomy, e.g. those of Euclid and Ptolemy, likely contributing original work of her own. Hypatia is also known to have constructed an astrolabe, an instrument used in navigation to measure the location of stars over the horizon, and a hydrometer, an instrument used to measure the density of liquids.

Apart from her research Hypatia devoted her life to teaching. After her father's death in 405 AD she became head of the Neoplatonic school in Alexandria, where she taught mathematics, physics, astronomy and philosophy. To be a female teacher who taught male students was another unusual accomplishment of a woman at that time. Importantly, Alexandria at Hypatia's times was a mixture of religious communities of Christians, Jews and pagans. She declared herself as non-religious and interestingly, admitted to her school everyone from everywhere independent of religion and background, including Greeks, Jews, Christians, pagans and native Egyptians. In addition to her school, Hypatia held public lectures, which were hugely popular and drew crowds, and also private courses in her home. Owing to her activities and attitudes Hypatia was highly respected by Alexandrians and became moral authority not only among her students but among the entire community of Alexandria, which greatly appreciated her wisdom and moral standards, honesty, truthfulness, diligence, and importantly, her attachment and devotion to the city. As a result she occupied a strong social, political, and cultural position in Alexandria (Hanson, 2019, *Who was Hypatia?* <https://medium.com/@mollyfhanson/who-was-hypatia-37d64a438064>, *In Memory of Hypatia of Alexandria*, <https://ordinaryphilosophy.com/2018/03/09/in-memory-of-hypatia-of-alexandria-3/>).

As a teacher Hypatia inspired her students to work hard, to develop their personalities and to acquire difficult knowledge. She demanded of them and herself, to inquire more deeply into matters, to look at the universe with fresh eyes, and to question the axioms of their day. That she was an excellent teacher revered by her students, can be inferred from their achievements – many of them held high political, administrative and church posts. One such successful student was her life-long friend Orestes, the governor of Alexandria representing the secular authority in the city (*Hypatia – Lover of Wisdom*, <https://justinedurrell.net/hypatia-lover-of-wisdom/>).

As shown, Hypatia dedicated her life to science and teaching. She never married and likely led a celibate life, which possibly was in keeping with Plato's ideas on the abolition of the family system. Even though her life aroused admiration with some and hostility with others, Hypatia was regarded as a remarkable woman. The Suda lexicon, a 10th-century encyclopaedia of the Mediterranean world, described her as

being “exceedingly beautiful and fair of form... in speech articulate and logical, in her actions prudent and public-spirited, and the rest of the city gave her suitable welcome and accorded her special respect.” (Fig. 1) (*Hypatia*, [http://penelope.uchicago.edu/~grout/encyclopaedia\\_romana/greece/paganism/hypatia.html](http://penelope.uchicago.edu/~grout/encyclopaedia_romana/greece/paganism/hypatia.html)).

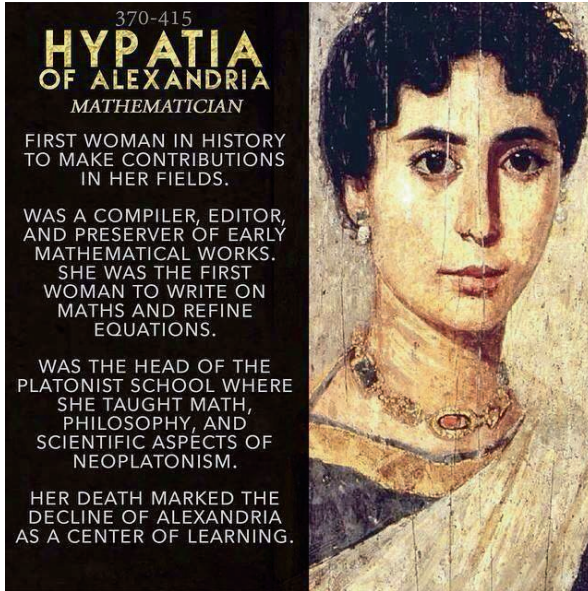


Fig. 1. There is no contemporary portrait of Hypatia. As a woman from the upper class she could have looked like a lady in the painting above, which is a fragment of one of the Fayum death portraits of a wealthy woman, c. 160–170 AD (Wikimedia Commons)

Hypatia’s death constituted the unfortunate side of her life in Alexandria. She died in 415 AD in dramatic circumstances, which resulted from a religious-political situation in Alexandria. In the early 410’s there grew a serious conflict between Orestes, Hypatia’s friend in charge of the civic government, and Cyril, the archbishop of Alexandria, a powerful man known for his hostility towards other faiths. The conflict was over who should control the city – the secular administration or the church. Orestes himself was a Christian but did not want to cede power to the church. It is also believed that Cyril was jealous of the high social standing of Hypatia and respect she enjoyed in Alexandria. It was obvious that eliminating Hypatia would have weakened Orestes’ position in this conflict. As a result, Hypatia was charged with witchcraft, satanism, disobedience and impiety. The mob of Christians, most likely instigated by Cyril, attacked her in the street, dragged her to a local church, stripped her naked and beat her to death with broken tiles. Then her remains were paraded through the city and burnt outside the city walls.

Throughout centuries Hypatia’s death has aroused controversies and has been interpreted in different ways. For the most cases Hypatia has been seen a victim of a political-religious fight, a victim of political jealousy and sometimes a martyr

of science. By contrast, Enlightenment scholars viewed her death in more general terms, i.e. as a symbol of a conflict between reason and religion, freedom and fanaticism, and knowledge and ignorance.

Independent of how her life and death are interpreted, Hypatia remains the first woman mathematician/scientist whose life is reasonably well documented, and most importantly, a symbol of an erudite, strong and independent woman.



Fig. 2. The school of Athens by Raphael (Hypatia marked with a black rectangle) (Wikimedia Commons)

Rich in a variety of exciting elements, the life of Hypatia has fascinated ever since and has become inspiration for numerous literary and art works. For instance Raphael included her in his School of Athens (Fig. 2). The most iconic and widely reproduced image of Hypatia is that by Jules Maurice Gaspard, prepared to be the illustration for Elbert Hubbard's 1908 fictional Hypatia's biography (Fig. 3). By contrast, Hypatia by Charles William Mitchell is a depiction of a scene of Hypatia's death in Charles Kingsley's 1853 novel "Hypatia" (Fig. 4).





Fig. 3. The fictional portrait of Hypatia by Jules Maurice Gaspard, 1908 (Wikimedia Commons)

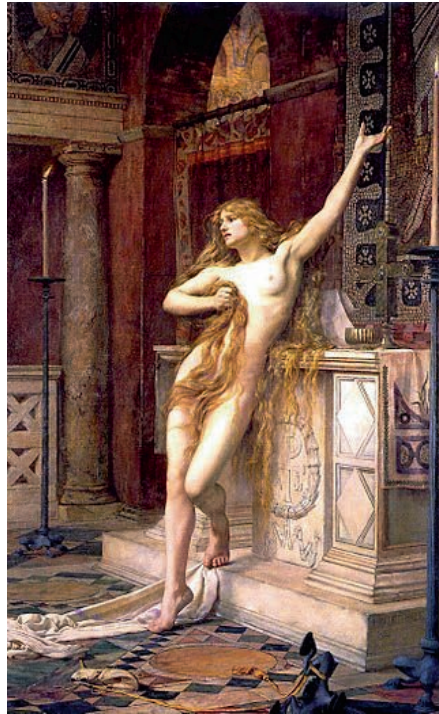


Fig. 4. Hypatia by Charles William Mitchell, the scene of Hypatia's death, 1853 (Wikimedia Commons)

In modern times, Hypatia also became inspiration for the feminist movement, where her life and death are regarded in terms of the women's rights, and for which her prominent social role in a patriarchal society, endurance and ability to overcome gender inequality became symbolic. As a female intellectual, Hypatia also became a role model for modern educated women and two feminist journals were named after her: "Hypatia: Feminist Studies" and "Hypatia: A Journal of Feminist Philosophy" (*Hypatia*, <https://en.wikipedia.org/wiki/Hypatia>).

### Modern attitudes derived from Hypatia's life

Even after so many centuries, Hypatia's remarkable life resonates with us and our modern values teaching us attitudes pertaining to our life. Let us look at some of them.

#### 1) Religious tolerance and religious neutrality

Hypatia was a mainstay of religious tolerance. Non-religious, she never urged anybody to forsake their religion or to convert. In her times, Christian-pagan turmoil was prevalent, but she invariably maintained religious neutrality even when Christians burnt down the Alexandrian library in the name of fight with

paganism, Accordingly, she had students, associates and friends of all religions and faiths (Pisarska-Umańska A., *Co ma Hypatia ze św. Katarzyną wspólnego*, <https://www.gdanskstrefa.com/hypatia-ze-sw-katarzyna-wspolnego/>).

2) Secular political authorities (separation of state and church)

As a Neoplatonist, Hypatia held that the state/city political authorities should be autonomous and secular. She shared the conviction that bishops' authority should not be involved in the civil administration and that political power should not be transferred onto the church (Pisarska-Umańska A., *Co ma Hypatia ze św. Katarzyną wspólnego*, <https://www.gdanskstrefa.com/hypatia-ze-sw-katarzyna-wspolnego/>).

3) Female scholar in a male-dominated world

Hypatia was, in her time, the world's leading mathematician and astronomer, the only woman with such recognition. This, in a male-dominated world at the time, proves not only her extraordinary, intellectual talents, but first and foremost her strength, independence and courage in the face of prevalent prejudicial gender standards, a fact that later duly made her a powerful feminist symbol (Deakin M., *Hypatia, mathematician and astronomer*, <https://www.britannica.com/biography/Hypatia>).

4) Charismatic teacher

Hypatia's renowned school was open to everyone interested regardless of faith and origin. She attracted students with her eloquent, engaging, inspiring and inquisitive lecturing for which they adored her and revered her. This is especially remarkable in view of the fact that she mentored male students (*Hypatia – Lover of Wisdom*, <https://justinedurrell.net/hypatia-lover-of-wisdom/>).

5) Social activity; Moral standards

Hypatia often held public lectures for the general public of Alexandria, either in her home in front of which crowds assembled or in lecture halls. She conversed on philosophy and science (which today we would refer to as popularizing science) as well as on the issues arising from the political and religious developments in Alexandria at the time. The attendants appreciated her teaching talents, as well as her beauty and both elegance and modesty. She was a moral authority in the city. People admired her knowledge and clarity and logic of argumentation, but also her temperance and moderation, simplicity and directness, sexual abstinence, and most importantly, her love of Alexandria, in whose issues she fully engaged (Pospieszny T., *Hypatia z Aleksandrii*, <http://piekniejszastronnanauki.pl/hypatia-z-aleksandrii/>).

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### Abstract

Hypatia lived in Alexandria in Egypt in the late 4th and early 5th century AD and was in her time the greatest mathematician and astronomer, also a philosopher and a charismatic teacher. She lived her life in a male-dominated world and outfaced the prevalent gender standards thanks to her personal characteristics including talents, strength, independence and courage. Apart from femininity, her attitudes included religious tolerance, high moral standards, ceaseless social and educational activity and political temperance. All of these attitudes apparently pertain to our modern life and are appropriate for teaching in today's schools.

**Keywords:** Hypatia of Alexandria, science, history, life attitudes, teaching

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