

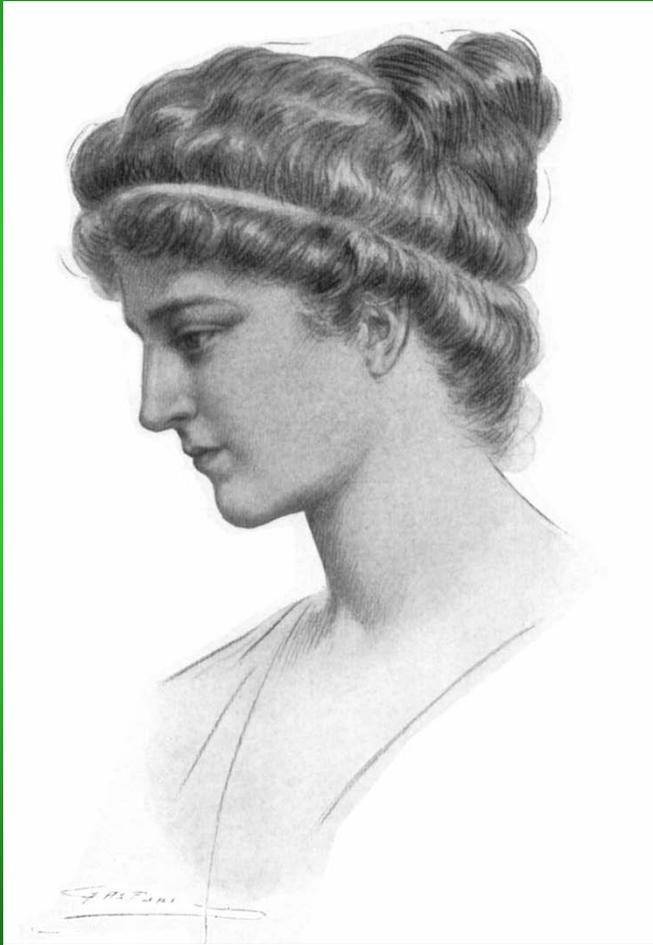
# Hypathia of Alexandria

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# Introduction



- Born in 350-355/370;
- Lived and learned in Alexandria, Roman Egypt;
- The daughter of Theon, the last director of the Museum of Alexandria;
- Trained by her father in physical education, mathematics, astronomy, philosophy, arts, literature, the principles of teaching, oratory;
- Died in 415, killed by a Christian mob who blamed her for religious turmoil.

# The Musaeum of Alexandria

- Founded in the 3<sup>rd</sup> century BCE by Ptolemy I Soter or his son Ptolemy II;
- Comprised gardens, a room for shared dining, a reading room, lecture halls, meetings rooms and a library;
- The Library of Alexandria:
  - an acquisitions department and a cataloguing department;
- The Mouseion (“The House of the Muses”) – an institution that brought together the best scholars of the Hellenistic world, a university;
- Destruction of the Mouseion and Library of Alexandria:
  1. Julius Caesar’s Fire in the Alexandrian War, 48 BC;
  2. The attack of Aurelian in the 3<sup>rd</sup> century AD;
  3. The decree of Theophilus in AD 391;
  4. The Muslim conquest in AD 642 and thereafter.



# Theon

(b: 335 – d. early 5<sup>th</sup> century)

- Most of the references on him and on Hypathia : Suda, the 10<sup>th</sup> century Byzantine encyclopedia;
- Highly educated scholar, mathematician and astronomer;
- A member and possibly the last director of the Alexandrian Museion, on public payroll.
- Devoted his scholarship to the study of his predecessors Euclid and Ptolemy; his recensions were designed for students;
- Euclid's *Elements*;
- Thirteen books of Ptolemy' *Almagest* ; *Handy Tables* : *The Great Commentary*, in five books, and *The Little Commentary* , in one;
- He worked together with scholar and student associates and with his daughter, Hypathia
- A treatise "*On the Small Astrolabe*" ;
- *On Signs and the examination of Birds and the Croaking of Ravens*: two essays on the function of the star Sirius and the influence of the planetary spheres on the Nile;
- 364 AD: predicted eclipses of the Sun and Moon in Alexandria.

# Hypathia's Works

- Like her father, she wrote recensions and commentaries intended for students;
- All works lost – the titles mentioned in the Suda encyclopedia;
- Apollonius of Perga's *The Conic Sections*;
- Diophantus' *Arithmetica* (six books);
- A new edition of Ptolemy's *Astronomical Tables* issued as the *Astronomical Canon*;
- In collaboration with her father she revised the third book of Ptolemy's *Almagest*, according to some historical sources possibly also other works by Theon.
- Devised an *astrolabe* and a *hydroscope* for her student Synesius of Cyrene.

# Hypathia – Teacher, Philosopher, Mathematician, Astronomer

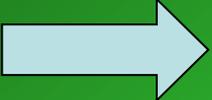
- Neo-Platonist philosopher, followed the school of the 3<sup>rd</sup> century thinker Plotinus, discouraging empirical enquiry and encouraging reason and contemplation;
- In her philosophy mathematics and astronomy primed the mind for speculation on higher epistemological levels;
- Her lectures took place at her home or in the city hall;
- She taught only elite students, including Christians, from Alexandria and elsewhere in Egypt, Syria, Cyrene, Constantinople;
- Adviser on current municipal issues;
- A model of ethical courage, righteousness, veracity, civic devotion, modesty and intellectual capacity.



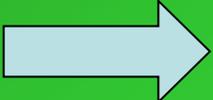
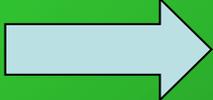
# Raphael's “Library of Alexandria”



# Theon and Hypathia's Intellectual Legacy

- Theon's recension of Euclid's *Elements*  
 Copernic, Kepler, Galilei, Newton  
(*Principia*)

Hypathia's recensions on:

- Apollonius of Perga's *The Conic Sections*  
 Kepler, Newton, Descartes;
- Dyophantus' *Arithmetica*  Pierre de Fermat's Last Theorem

# Hypathia in History

- Hypathia and Theon had a profound impact on the survival of early thought in mathematics.
- Hypathia is considered to have been one of the greatest professors of philosophy, mathematics and astronomy of all times.
- In the 20<sup>th</sup> century her name was given to a crater and to a system of rilles on the Moon, as well as that of Theon ( the lunar crater “Theon Junion”).

# References

- Maria Dzielska, *Hypathia*, Harvard University Press, 1996;
- Internet