

THE COMA CLUSTER IN HISTORY.

Too faint to be seen by the human eye (or binoculars or even small telescopes), the ancients could not have seen the galaxy cluster and hence no mythology is associated with it. However, the Coma Cluster, also known as Abell 1656, is extremely interesting historically. Not only is it one of the largest and most densely populated clusters of galaxies known, it is also the source of our first ideas about the dark matter in our universe. Unseen and mysterious, this matter greatly increases the total mass and gravitational strength of the universe, further affecting its evolution and fate.

Dark matter was unknown and unsuspected until Swiss-American astronomer **Fritz Zwicky** discovered it in the Coma Cluster in the 1930s. Zwicky tallied up the visible galaxies in the cluster and estimated its mass. Then he observed the motions of galaxies near the edge of the cluster, which are determined by the total gravity (and hence mass) of the cluster. Zwicky found that the mass derived from the latter method greatly exceeded that from visual inspection. Zwicky knew that if the law of gravity is correct — and there is no reason to doubt it — the only answer could be an additional source of mass, which he called **Dunkle Materie** in German.

Today, the imprint of dark matter has been found throughout the universe, and is at least five times more prevalent than the more familiar visible matter, such as the stars and galaxies we can see.

Dark matter is a hypothetical form of matter that is thought to account for approximately 85% of the matter in the universe and about a quarter of its total energy density. The majority of dark matter is thought to be non-baryonic in nature, possibly being composed of some as-yet undiscovered subatomic particles. Its presence is implied in a variety of astrophysical observations, including gravitational effects that cannot be explained by accepted theories of gravity unless more matter is present than can be seen. For this reason, most experts think dark matter to be ubiquitous in the universe and to have had a strong influence on its structure and evolution.

THE STORY OF COMA BERENICES

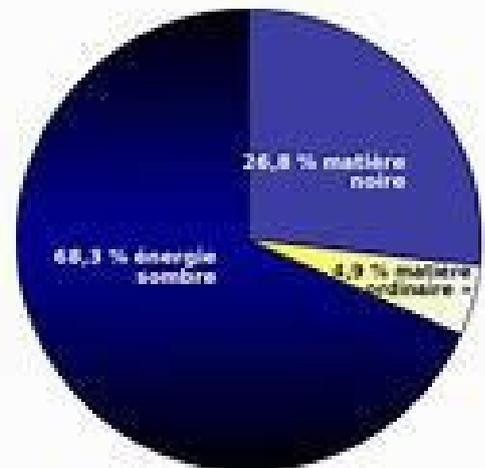
We have talked about it before: Coma Berenices is an ancient asterism in the northern sky which has been defined as one of the 88 modern constellations. It is located in the fourth galactic quadrant, between Leo and Boötes, and is visible in both hemispheres. Its name means "Berenice's Hair" in Latin and refers to **Queen Berenice II of Egypt**, who sacrificed her long hair as a votive offering. It was introduced to Western astronomy during the third century BC by **Conon of Samos** and was further corroborated as a constellation by **Gerardus Mercator** and **Tycho Brahe**.

Coma Berenices is the only modern constellation named for a historic person.

AK, With EarthSky and Wikipedia Notes



Astronomer Fritz Zwicky first predicted the existence of dark matter in the 1930s following his observations of the Coma galaxy cluster.



Close-up on a majestic face-on spiral galaxy located deep within the Coma Cluster of galaxies.