Dark matter

Whenever we hear about dark matter, the first thing that come in this human mind that IS IT DARK?

The answer is NO! rather its invisible to human eyes, here a thought comes, then is this visible to other organisms, the reply is NOONE KNOWS!

But what is dark matter?

The dark matter is the moniker for the invisible mass in the space from which more than 70% of our present universe is made up of. This "missing mass" problem was first fully analysed in 1957 by Swiss-American astrophysicist Fritz Zwicky. Zwicky studied the movement of individual galaxies within a titanic cluster of them. They traced the constellation Coma Berenices (the "hair of Berenice" an Egyptian queen in antiquity). The Comma cluster, as we call it, consists of most of the Abell (galaxies clusters) and is an isolated and richly populate ensemble of galaxies about 300 million light years away from us.

How we reached the evidence of this missing mass?

Zwicky studied the average velocity of the comma cluster but that came out with shockingly high values,

we know that a body with high mass has high gravitational field around itself as the result its velocity also gets peak. However, the mass of the comma cluster ranks higher than any of the clusters in our universe butthe visible member galaxies making this high mass of the cluster was very less.

What? this means our law of gravitation stopped working here? Newton stated that we can derive the orbital and escape velocity of a object around its source object. The escape velocity is square root of two times the orbital velocity.

When Zwicky examine the comma cluster in 1930s, he found that the member galaxies were moving more rapidly than the escape velocity for the cluster.

This means that cluster should swiftly fly apart, leaving the trace of its beehive existence after just a few hundred million years (ten crore years) But the cluster age more than ten billion years old (ten Arab years or thousand crore years) which is nearly as old as our beautiful universe. And so was born what remains the longest-standing unsolved mystery in astrophysics.

After few decades one more evidence for this missing mass problem came into seen, in 1976 an astrophysicist Vera Rubin discovered a similar mass anomaly within the spiral galaxies. Rubin first found that the stars nearer to the galaxy centre moves with higher rotational velocity due to the visible matter and the stars farther from the galaxies moves with the speed because of their high masses, but once we come beyond the luminous disk of the galaxies one may notices some isolated gas clouds and few bright stars. Rubin discovered that their orbital velocities which should now be falling with increasing distance out there in Nowheresville in fact remained high. This empty space with high-speed mysterious zones is now called "dark matter haloes". This haloes problem can be seen from galaxy to galaxy.

All in all, dark matter is somethingthat’s binding the object and is responsible for high orbital velocities of the objects in the space. For now, we must remain content to carry dark matter along a strange, invisible friend, invoking it where and when the universe requires it of us.

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