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Law and its Application in the Study of Dark Matter and Black Hole

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About the Study

In this article, Newton's gravitational formula is modified by the superposition principle of spatial energy fields, and the problem of "mass loss" in galaxies is analyzed by this modified gravitational formula. This concludes that the strength of the energy field inside the galaxy and the space-time curvature of the galaxy are significantly underestimated, and that the speed of stars in the galaxy is too fast due to the absence of dark matter and supermassive black holes. A hole in the galaxy in 1922, astronomer Jacob Scaptain suggested that the possible existence of invisible matter around a star could be indirectly inferred from the movement of the star system. In 1932, astronomer Jan Oort studied dark matter through the movement of stars near the solar system.

However, no definitive conclusion was drawn that dark matter exists. In 1933, astrophysicist Fritz Zwicky used spectral redshift to measure the velocity of each galaxy in the Coma Cluster in comparison to clusters. Using the Virial theorem, he found that the galaxies in the cluster were moving too fast to be bound by the gravitational force created by the visible mass of the galaxies in the cluster. Therefore, there should be a large amount of dark matter in the cluster that is at least 100 times the mass of the visible galaxy. Smith's observation of the Virgo cluster in 1936 confirms this conclusion. Important evidence of the existence of dark matter comes from a 1970 study by Vera Rubin and Kent Ford on the speed of rotation of stars in the Andromeda galaxy. Using high precision spectral measurements; they can detect the relationship between the speed and distance of peripheral stars away from the galactic nucleus.

According to Newton's law of gravity, if the mass of a galaxy is mainly concentrated on the visible stars in the nucleus of the galaxy, the velocity of the stars around the galaxy will decrease with the distance. But observations show that the velocity of stars around the galaxy is constant over a considerable range. This means that there may be a lot of invisible matter in the galaxy not just in the core of the galaxy, and its mass is much larger than the sum of the mass of the luminous stars. The space energy density or space-time curvature of the dense region of stars near the center of a galaxy is already very high, large celestial bodies in this region tend to form curved space-time at their center or in their space with curvature beyond the event horizon. At the edge of the galaxy, the low spatial energy density makes it difficult for celestial bodies to form a curved space-time with curvature beyond the event horizon in the center or space. From this, we can conclude that all black holes except the supermassive black hole in the galactic center are in a dense region of stars near the galactic center.

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