

Light is shed on darkest galaxies

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Computers were used to simulate galaxy formation

The mystery of how the darkest galaxies in the Universe came to exist may have been solved by scientists.

Dwarf spheroidals are galaxies composed almost entirely of dark matter; faint examples have been discovered orbiting the Milky Way and Andromeda galaxies.

Scientists believe these dark systems were once gas-rich, but as they became satellites of larger galaxies, most of their visible matter was stripped away.

The study, reported in the journal *Nature*, may shed light on dark matter.

The scientists used computer simulations to uncover what might have happened 10 billion years ago as a gas-dominated dwarf galaxy hurtled into the orbit of a larger, Milky-Way-sized system.

They found the drag force, or "ram pressure", created as a smaller galaxy moved through the more massive one would have stripped away the dwarf galaxy's interstellar gas.

The model also showed the gravitational tug from the larger system would have wrenched away many of the dwarf system's luminous stars.

The result, said the international team, was a galaxy where most of the visible matter was absent, leaving mainly dark matter behind.

'Grand challenge'

Stelios Kazantzidis, an astrophysicist from Stanford University and an author of the paper, said: "These results are so exciting because they are based on a combination of physical effects that has never before been postulated.

"This is one step toward a more complete understanding of the formation of structure in the Universe, which is one of the fundamental goals of astrophysics."

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The researchers believe all luminous galaxies should be surrounded by a few extremely dark matter-dominated spheroidal galaxies.

And, said Dr Kazantzidis, studying them may provide insights into mysterious dark matter.

He added: "Elucidating the nature of dark matter is one of the grandest challenges of modern cosmology.

"In the next several years, numerous experiments will attempt to detect dark matter using dwarf spherical galaxies as targets."

<http://news.bbc.co.uk/2/hi/science/nature/6360757.stm>