Name _____

Unveiling the Cosmic Mystery: Dark Matter's Role in the Universe

Short Answer Key

1. We indirectly detect the presence of dark matter through its gravitational effects on visible matter. It causes galaxies and galaxy clusters to move in ways that cannot be explained by the gravity of visible matter alone.
2. Dark matter is essential for the formation and structure of galaxies because it provides the gravitational support necessary to hold galaxies together. Without dark matter's gravitational influence, galaxies would not have the mass needed to maintain their shape.
3. The cosmic microwave background (CMB) is the afterglow of the Big Bang, and it provides information about the early universe. Dark matter's presence affects the distribution of matter in the universe, leaving imprints in the CMB that cosmologists study to learn more about the universe's history.
4. Dark matter contributes to the cosmic web by forming a vast, interconnected structure that connects galaxies and galaxy clusters. It acts as the scaffolding of the universe, guiding the movement of matter through space.
5. Dark matter primarily influences the universe through its gravitational effects, while dark energy is responsible for the acceleration of cosmic expansion. Dark energy is a mysterious force that counteracts gravity on large cosmic scales.