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## THE STUDY AND COMPARISON OF THE GENERALIZED CHAPLYGIN GAS MODEL AND THE UNIFICATION OF DARK ENERGY AND DARK MATTER

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The Universe as we know is expanding at an accelerated rate. This was experimentally observed using the redshift of type IA supernovae data. To explain this accelerated expansion the most viable solution is a smooth component with negative pressure named the dark energy. Today there are various models that are fitted to explain dark energy (for example: CDM,  $\lambda$ CDM, Quintessence, Cardassian and etc.) and among them is the Generalized Chaplygin Gas (GCG) model in which one considers a single component for dark energy and dark matter (unification).

In this research, the focus is to explain the accelerated expansion of the universe using the GCG and also to look at the unification of dark energy and dark matter through the GCG. The procedure followed was first to look at the variation of the inhomogeneities and the density contrast of the universe through this model. Furthermore, the energy density of the GCG is considered to be an addition of interacting dark matter and cosmological constant like dark energy and the interaction between these two components are used to explain the accelerated expansion.