

## Short Abstract of PhD Thesis

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**PhD Thesis Title :** Generalized Uncertainty Scenario of Quantum Gravity in White Dwarfs and Extended Gravity Scenarios in Quark Stars and Inflationary Cosmology

**Abstract :** The well-known Chandrasekhar limit has played an important role in Astronomical observations. Even in observational Cosmology, the very existence of this limit has shown that our Universe is undergoing an accelerated expansion. However, it has been proved in the recent literature that the Chandrasekhar limit becomes non-existent when the effect of quantum gravity is taken into account. This casts a serious doubt on decades of observations. This dilemma is resolved in the thesis employing general relativity and by analyzing the dynamical stability of white dwarfs incorporating quantum gravity effects. In addition, recent observations suggest the existence of massive neutron stars or pulsars. We have found the possibility of massive neutron stars in an extended gravity model with gravity-matter coupling. Furthermore, we have proposed a theory of reheating after the inflationary phase of the Universe with a viable extended gravity model by formulating a plausible scenario of particle production obeying the Heisenberg uncertainty principle.