Implications of the Cosmological Constant for Spherically Symmetric Mass Distributions[1] OMAIR ZUBAIRI, FRIDOLIN WEBER, San Diego State University — In recent years, scientists have made the discovery that the expansion rate of the Universe is increasing rather than decreasing. This acceleration leads to an additional term in Albert Einstein's field equations which describe general relativity and is known as the cosmological constant. This work explores the aftermath of a non-vanishing cosmological constant for relativistic spherically symmetric mass distributions, which are susceptible to change against Einstein's field equations. We introduce a stellar structure equation known as the Tolman-Oppenhiemer-Volkoff (TOV) equation modified for a cosmological constant, which is derived from Einstein's modified field equations. We solve this modified TOV equation for these spherically symmetric mass distributions and obtain stellar properties such as mass and radius and investigate changes that may occur depending on the value of the cosmological constant.

Omair Zubairi
San Diego State University

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