## The Modern Physics of Compact Stars and Relativistic Gravity 2019



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## Hydrostatic equilibrium and stellar structure in Extended Gravity

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We investigate the hydrostatic equilibrium of stellar structure by taking into account the modified Lane'-Emden equation coming from Extended Theories of Gravity. Such an equation is obtained in metric approach by considering the Newtonian limit of Extended Gravity, which gives rise to a modified Poisson equation, and then introducing a relation between pressure and density with polytropic index n.The modified equation results an integro-differential equation, which, in the limit of General Relativity becomes the standard Lane'-Emden equation. We find the radial profiles of gravitational potential by solving for some values of n. The comparison of solutions with those coming from General Relativity shows that they are compatible and physically relevant. A comparison with observational data of some peculiar objects is presented.

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