Advances in Astronomy

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Special Issue on

Astrophysical Objects in Extended Gravity Theories

CALL FOR PAPERS

Astrophysical objects, such as black holes, strange stars, neutron stars, white dwarfs, gravastars, and wormholes, are a great "laboratory" to study the strong field regime of gravity. With continuous advances in observational astrophysics, the study of gravity within these objects has been facing some challenges in the context of standard gravity, known as General Relativity. For instance, a few years ago, the existence of some massive (~ 2 solar masses) pulsars was reported [J. Antoniadis et al., Science 340, 448 (2013); P.B. Demorest et al., Nature 467, 1081 (2010)]. According to General Relativity, neutron stars would hardly attain 2 solar masses. Similarly, some super-Chandrasekhar white dwarfs have also been detected [D.A. Howell et al., Nature 443, 308 (2006); R.A. Scalzo et al., The Astrophysical Journal 713, 1073 (2010)]. Such detections also challenge General Relativity predictions of the maximum mass of white dwarfs. These and other issues, such as the General Relativity prediction of existence of negative mass matter filling wormholes [M.S. Morris and K.S. Thorne, American Journal of Physics 56, 395 (1988)], can, in principle, be excluded from the analysis of the above objects within the Extended Gravity Theories perspective. In other words, the extra degrees of freedom of the Extended Gravity Theories can allow the maximum mass limit of neutron stars and white dwarfs to increase, as well as providing the correct mechanism necessary to fill wormholes with nonexotic matter.

This special issue welcomes original research articles that focus on the analysis of astrophysical objects in the context of Extended Gravity Theories. We are hoping to attract studies regarding the possible attainment of high masses of neutron stars and white dwarfs quoted above from the Extended Gravity Theories perspective. Moreover, the question of whether it is possible to obtain nonexotic matter wormhole solutions in these theories is expected to be addressed. The physical consequences of studying black holes, strange stars, and gravastars in Extended Gravity Theories are also welcome. We also expect to receive review articles describing the current state of the art within this broad subject.

Potential topics include but are not limited to the following:

- Hydrostatic equilibrium configurations of neutron stars, strange stars, and white dwarfs in Extended Gravity Theories
- Black hole solutions in Extended Gravity Theories
- Gravastar solutions in Extended Gravity Theories
- Static wormhole solutions in Extended Gravity Theories
- Cosmological wormhole solutions in Extended Gravity Theories

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/aa/aoeg/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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