

Anisotropic stars as ultracompact objects in general relativity

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Anisotropic stresses are ubiquitous in nature, but their modeling in General Relativity is poorly understood and frame-dependent. In this talk, I will present the first study on the dynamical properties of anisotropic self-gravitating fluids in a covariant framework. I will show that anisotropic stars can be as compact and as massive as black holes, thus providing a proper theoretical framework for the study of ultracompact objects and tests of the black hole paradigm. I will discuss the phenomenology of these objects, showing that their Love numbers vanish in the BH limit and that ultracompact anisotropic stars are associated with gravitational-wave echoes when perturbed.

[1] G. Raposo, P. Pani, M. Bezares, Carlos Palenzuela and Vitor Cardoso, “Anisotropic stars as ultracompact objects in general relativity”, arXiv:1811.07917, submitted (2018);