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Black Holes in modified gravity theories

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The search for alternative theories of gravity is motivated by several considerations, such as Dark Energy, or the existence of singularities in General Relativity. A general subclass of modified gravity theories are scalar-tensor theories, which have been developed in the last decades. It is rather interesting to search for observables that could constrain those theories. Black Holes are objects with extreme gravitational field, making them very suitable for testing gravity theories, and so are in the scope of this work. The goal of the work presented is to find new Black Hole solutions in scalar-tensor theories, which might differ from the unique Kerr Black Hole of General Relativity. With the upcoming of high precision detectors such as LISA, or Einstein Telescope, we will have the observational tools required to assess whether or not real Black Holes are compatible with General Relativity, or with the ones of alternative theories.

Astrophysics Field

Compact Objects / theory

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