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Searching for scalars in spinning binaries

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Light scalar fields that couple disformally to matter are a common feature in many alternative theories of gravity, such as in (beyond) Horndeski and general DHOST theories, in the decoupling limit of massive gravity, and in various brane-world scenarios. Exploring how well this kind of interaction is constrained by observational data thus provides valuable information for distinguishing between viable and unviable models. In this talk, I will describe recent work on the behaviour of binary systems that couple disformally to a light scalar field; focusing, in particular, on the effect of a disformal spin-orbit interaction. As it turns out, this interaction can dominate over the other spin-independent effects from the scalar in certain scenarios, and thus can be quite strongly constrained.

[Based on 2011.01213 and 2107.10841]

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