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How to break spacetime symmetries and get away with it

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In this talk I will introduce tools for the construction of effective field theories (EFTs) that involve the breaking of spacetime symmetries. Nowadays, symmetry breakdown is part and parcel of the study of EFTs, with group theory allowing us to derive the most generic action for the Goldstone bosons—but only if the group is internal. When spacetime symmetries are broken, the game becomes much harder: the counting of Goldstones becomes nontrivial, they can be massive, and the EFT construction might fail altogether. Yet it's precisely the breakdown of spacetime symmetries that is so important for cosmology, because the universe expands over time. I will outline the challenges when breaking spacetime symmetries and discuss new techniques to tackle them and to classify EFTs. The goal is to develop an improved framework for the constructions of EFTs in the context of cosmology, particularly inflation, and other gravitational systems.

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