The Search for Chaos in Modified Gravity ALEXANDER DEICH, ALEJANDRO CRDENAS-AVENDAO, NICOLS YUNES, University of Illinois at Urbana-Champaign — While recent observations by the LIGO/Virgo have given us the ability to test general relativity in the extreme gravity regime, they are still blind to a large swath of phenomena that is outside the sensitivity curve of these instruments. Future detectors such as LISA will enable us to probe longer-duration, lower-frequency events, and in particular enable us to search for chaos in the trajectories of an extreme mass-ratio inspiral (EMRI), when a small compact object falls into a supermassive black hole. In this talk, I will discuss the possibility of detecting chaos in EMRIs, and how we can use them to constrain modified gravity theories. I will focus on one quadratic modification, Einstein-dilaton-Gauss-Bonnet (EdGB), a theory with a non-trivial scalar field. I will present a framework and code-base used to search for chaos, and discuss the implications for finding chaos in EMRI observations with LISA.

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