Contributed Talk

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Title: Stumbling around in the modified gravity landscape.

Abstract: Parameters extracted from Gravitational Wave (GW) data allow observers to quantify certain physical aspects of GW producing sources, like neutron stars (NS) and black holes (BH). In the case of an isolated BH, its physical shape in space, as a freely falling asymptotic observer would deduce from data, combined with its inertial mass, gets encoded in GWs radiated from these sources. In classical terms, a multipolar structure of radiating sources can be established from the GW data, giving a freely falling observer a dynamic view of the 'horizon' of a BH as it undergoes a damped oscillation towards a stable shape. However, the dynamical behavior is the opposite when the source is a binary system. Two 'symmetric' bodies mutually deform each other to a maximally distorted single compact object, radiating GWs that increase in frequency and amplitude (to specific maximum values) along with the distortion. Using a Zangenbewegung approach towards the maximal distortion (known in GW literature as the merger) from both sides (ring-down and inspiral, respectively), I will talk about GR's predictions and the corresponding predictions made by extended theories of gravitation like f(R) and dynamical Chern-Simons.