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Exciting Black Holes with stars

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Astrophysical Black Hole (BH) observations highly depend on external factors, as these objects do not emit light. For non-rotating (Schwarzschild) BHs, the light ring, located at R=3MG/c^2, is a region where light rays perform unstable circular orbits, eventually escaping it and reaching a distant observer. Therefore, an infalling star observation would have contributions of both the radially emitted radiation and decaying of the light ring, where the latter dominates for longer periods of time. Even though this is tested numerically via simulations of the luminosity measured by a far away observer, it does not contemplate rotating BHs. The goal of this thesis is to simulate this setup for rotating BHs, aiming for results that give us a better understanding of BH observations.

Field of Research/Work

Cosmology, Astrophysics, and Gravitation

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