

F. Duque: GWs from EMRIs in Astrophysical Environments (WP3)

Tuesday, June 6, 2023 9:00 AM (40 minutes)

Third-generation gravitational-wave detectors and the space-based LISA mission will observe binaries in galactic centers involving supermassive black holes with millions of solar masses. These binaries can interact gravitationally with accretion disks, dark matter halos and other compact objects. The role these astrophysical structures play in the evolution and gravitational-wave signature of binary systems remains largely unexplored and previous studies have often relied on ad-hoc Newtonian approximations. In this talk, we will develop the first fully-relativistic framework capable of studying gravitational wave emission in non-vacuum environments. We apply it to galactic black-hole binaries surrounded by different dark matter environments and draw consequences for the future of gravitational-wave astronomy.