

## **C. Pacilio: Testing GR with large catalogs: the cosmic variance of hierarchical tests (WP4)**

*Tuesday, June 6, 2023 2:00 PM (40 minutes)*

Testing the strong gravity regime of general relativity is a primary goal of gravitational wave detectors. While it is expected that corrections to GR are small and unlikely to be identified with individual events, third generation GW detectors will allow detection of tens-of-thousands of events per year. Therefore, they will pave the way to precision tests by carefully stacking all the detected events. In this talk, I will first present the prospects of performing black hole spectroscopy with third generation detectors, showing that the number of detections and the precision in their measurements make it a relevant science case for testing GR. Then, I will show that biases away from GR can arise within hierarchical tests from a population of events, even when stacking very large catalogs. Finally, I will discuss statistical methods to mitigate these biases and avoid false claims of GR violations.