

## **Pick the right one: Bayesian model selection on catalogs of gravitational-wave events**

*Davide Gerosa, Institute of Gravitational Wave Astronomy, University of Birmingham (UK)*

As the number of gravitational-wave detections increases, interest is shifting from determining the parameters of single events to inferring those describing the entire population of sources. These contain precious insights into the demographics of progenitor systems and the physics guiding stellar evolution. In this talk, we summarize and report progress on a novel statistical technique to mine gravitational-wave catalogs and directly infer posterior probability distributions of the population parameters. We train a Gaussian-process emulator on large banks of compact-binary population-synthesis simulations and use it as a prior to analyze incoming data. Our approach also includes optimal simulation design and information compression, resulting in a fast method that can be easily adapted for training on arbitrary population synthesis codes, as well as different detectors. More on [arXiv:1806.08365](https://arxiv.org/abs/1806.08365).