

## XII AVOGADRO MEETING <br> on Strings, Supergravity and Gauge Theories

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### **Black hole mergers and gravitational waves**

*Thursday, 22 December 2016 09:00 (2 hours)*

The broad scope of these lectures is to introduce the basic elements which are necessary to understand the GW signals from a BH binary merger recently-observed by LIGO, and to provide the basis of some state-of-the-art applications in this rapidly-growing field.

#### Content

- i) A GW physics primer.
- ii) Introduction to the post-Newtonian formalism. The case of circular inspiral.
- iii) Black-hole perturbations and quasinormal modes (QNMs)
- iv) GWs from a radial plunge of a test particle into a black hole: QNM ringing
- v) Black-hole spectroscopy: tests of gravity and of near-horizon physics
- vi) Numerical Relativity and Effective-One-Body (EOB) approach

**Presenters:** PANI, Paolo (Rome Sapienza); BERNUZZI, Sebastiano (P)