Contribution ID: **100** Type: **Oral presentation**

Gravitational-wave astronomy: what's next?

The observation of compact binary mergers by the LIGO/Virgo collaboration marked the dawn of a new era in astronomy. LISA will expand this vision by opening a new observational window at low frequencies. The gravitational radiation emitted by compact binary systems in these two frequency windows encodes important information on their astrophysical formation mechanism. Furthermore, compact objects - whether in isolation or in binaries - are excellent astrophysical laboratories to probe our understanding of high-energy physics and strong-field gravity. I will highlight the potential of Earth- and space-based detectors to further our understanding of the formation and evolution of compact binaries. I will also discuss potential smoking guns of new physics in gravitational-wave detectors, and the theoretical and observational challenges associated with their search.

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