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## **Populations of binary compact objects: exciting prospects with gravitational-wave astronomy**

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Advanced LIGO and Advanced Virgo have so far detected a total of 90 compact binary coalescences. These observations provided crucial information on neutron star and black hole populations, and already changed our understanding of the formation of compact binary systems. In this talk I will focus on some of the outstanding open questions raised by gravitational-wave observations, including the formation channels of binary black holes and the origin of intermediate-mass black holes. I will then discuss how observations with current and next-generation detectors will contribute to compact object population studies.

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**Classifica Sessioni:** Science from O4 to Post O5

**Classificazione della track:** Perspective for GW observation: O5 and Post O5