

**From galaxy pairs to massive black hole mergers.
Prospects for gravitational waves detections**

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Abstract: Our understanding of the seed and evolution of black holes over cosmic time will make a huge step forward in the next decades thanks to gravitational waves. However, predictions of the BH merger rate and detections by new experiments such as LISA are based so far on cosmological simulations only, which do not resolve yet the dwarf galaxies ($M^* < 10^9 M_\odot$) regime. Thanks to the analysis of VLT/MUSE deep fields, I will show that such predictions can now be based on measurements of the galaxy merger rate over 12.5 Gyrs of galaxy evolution and covering a broad range of galaxy stellar masses (10^7 - $10^{11} M_\odot$), thus extending into the dwarf galaxy regime.