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ET-WST synergy for next generation gravitational wave multi-messenger observations

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The Einstein Telescope (ET) will detect up to 10^5 binary neutron star system mergers (BNS) per year beyond z~3, clearly revolutionizing gravitational waves (GW) multi-messenger (MM) astrophysics. The optical-near infrared electromagnetic (EM) counterparts of such BNS will likely be faint and to be found within the large GW signals error regions, among a huge number of contaminants. The bottleneck of GW MM science will be to gather the spectroscopic data required to discriminate against EM counterpart candidates, identifying and characterizing them. Therefore, new observational strategies to select GW events and detect the EM counterparts will be necessary, and they have to be prepared well in advance of ET operations.
I will present the results of the work I am carrying out within the Wide-field Spectroscopic Telescope (WST) science team and the MM division of the ET Observational Science Board to assess the impact of the next generation Integral Field Spectroscopy (IFS) and Multi-Object Spectroscopy (MOS) on the detection, identification and characterisation of EM counterparts of ET BNS, with the aim to provide the specifications required, and to prepare the synergy with ET.

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