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From the first GW detections to multi-messenger observations including CTA : insight and prospects

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The recent detection of gravitational waves (GWs) from a binary neutron star (BNS) merger, in coincidence with a weak short GRB, opened the era of multi-messenger astronomy and provided the first direct evidence that at least a fraction of BNSs are progenitors of short GRBs. One of the challenges for future multi-messenger observations will be the detection of short GRBs at very-high energies (VHE, >20 GeV) in association with GWs : this will allow us to better understand the physics of the GRB outflow and their radiation mechanisms. The Cherenkov Telescope Array (CTA), an advanced, next generation ground-based facility, will be fundamental for the EM follow-up of transient GW events at VHE, owing to its unprecedented sensitivity, rapid response (few tens of seconds) and capability to monitor large sky areas via survey-mode operation.

In this talk I discuss what we learned from the recent GW and multi-messenger detections and I present a comprehensive study on the prospects for joint GW and VHE EM observations of merging BNSs with Advanced LIGO, Advanced Virgo and CTA.

Le café sera servi 10 minutes avant.

NB : La présentation d'une pièce d'identité est exigée à l'entrée du centre. Tous les auditeurs extérieurs sont priés de prévenir à l'avance Martine Oger, tél. 01 69 08 23 50, e-mail : `martine.oger@cea.fr`. (U.E. : délai de 24 h, hors U.E. : délai de 4 jours).