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## High-energy diffuse emission from the Milky Way, a new multi-messenger perspective

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Being for centuries a magnificent and enigmatic environment in the low energy regime, the Milky Way became, during the last decades, the prominent astrophysical lab to understand the high-energy diffuse emission produced by charged particles propagation and interactions with the interstellar medium. A Galactic cosmic-ray transport model featuring non-homogeneous transport has been developed over the latest years. This setup is aimed at reproducing  $\gamma$ -ray observations in different regions of the Galaxy (with particular focus on the progressive hardening of the hadronic spectrum in the inner Galaxy) and was shown to be compatible with the very-high-energy  $\gamma$ -ray diffuse emission recently detected up to PeV energies and with the local cosmic-ray measurements. In this contribution we show the diffuse high-energy neutrino emission expected, following a recent update of this model, for the whole Galaxy and for the Central Molecular Zone where the massive clouds of Sagittarius are placed. Considering the last improvements on events reconstruction of neutrino telescopes a possible detection of this diffuse  $\nu$  signal seems behind the corner. Such a discovery can break the degeneracy between this model and other scenarios featuring prominent contributions from unresolved sources and TeV halos. Moreover the Galactic cosmic-ray cutoff would be well defined.

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