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Multimessenger emission of Accretion-Induced Collapse events

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An white dwarf (WD) which accreates enough mass to surpass the Chandrasekhar limit will became unstable and will initiate a collapse stage due to its own gravity. Depending on their composition and their accretion history, the collapsing WD may trigger a thermonuclear explosion (and lead to a Supernova Ia) or not. In the latter case, the collapse, completely driven by the electron capture process, will proceed until the central density reaches nuclear saturation density when the core of the collapsing star will expand abruptly and push its outer layers in an outwards motion. To the second scenario, where a proton-neutron star is left as an remnant, it is given the name of accretion-induced collapse (AIC). Due to the accretion history of AICs and their highly spinning and (probably) magnetized remnant, these events have historically been proposed as the engines of short gamma-ray bursts and millisecond pulsars. AIC are also related to the nucleosynthesis of rare neutron-rich isotope, due to the (initially) low electron-fraction content of their ejecta. In this talk, we will explore different aspects of AICs, exploring for example the imprint of the progenitor angular momentum on their multimessenger emission.

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