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From ANTARES to KM3NeT neutrino telescopes in the Mediterranean Sea

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ANTARES, the largest deep-underwater Cherenkov neutrino telescope operating in the Northern hemisphere, has been taking data since 2007 with the primary objective of searching for high-energy astrophysical neutrinos in the TeV-PeV range. Thanks to its excellent angular resolution, ANTARES has searched for neutrino sources and set important constraints on the origin of the neutrino cosmic flux, first observed by IceCube. The most recent results of ANTARES searches for neutrinos sources will be reported, as well as from WIMP annihilation in massive objects like the Sun or the Galactic Centre. Moreover, the ANTARES constraints on the neutrino oscillation parameters will be presented.

Building on the successful experience of ANTARES, the next generation KM3NeT neutrino telescope is currently under construction in the Mediterranean Sea to significantly boost the sensitivity. More precisely, two detectors with a combined instrumented volume hundred times larger than ANTARES will be deployed: KM3NeT/ARCA (Gton instrumented volume) focusing on high-energy cosmic neutrinos, and KM3NeT/ORCA (Mton instrumented volume) for the determination of the neutrino mass hierarchy. An overview on the physics potential of KM3NeT will be highlighted.

Presenter: CHABAB, Mohamed (Cadi Ayyad University)

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