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Results and status of the Antares and KM3NeT neutrino telescopes

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While the Antares undersea neutrino telescope has been decommissioned this year - after 15 years of continuous data taking - the KM3NeT neutrino telescopes are well underway in their construction in the same, deep, Mediterranean waters. The main scientific goals of the KM3NeT detectors are finding and studying sources of high-energy (TeV-PeV) neutrinos with KM3NeT/ARCA (Astroparticle Research with Cosmics in the Abyss), and determining the ordering of the neutrino masses using GeV energy atmospheric neutrinos with KM3NeT/ORCA (Oscillations Research with Cosmics in the Abyss). The Antares telescope and the KM3NeT detectors use the same principle for neutrino detection. By instrumenting large volumes of seawater with photo-multiplier tubes, the Cherenkov light from charged products of neutrinos interactions can be detected. While Antares used large, 10-inch PMTs, the KM3NeT detectors have improved upon this concept and concentrate 31 3-inch PMTs in the same glass spheres. In their final configurations, the ORCA telescope will densely instrument about 7 megatonnes of sea-water, and the ARCA telescope about a gigatonne in a less dense configuration. While growing in size, the ORCA and ARCA telescopes have already provided data and measurements, showing their capabilities. The science programme of the Mediterranean telescopes also includes multi-messenger astronomy, dark matter and exotics searches, and cosmic-ray physics. In this talk, selected results of Antares will be presented, together with the status and results from the growing ORCA and ARCA detectors, which carry on the Antares legacy with an improved energy range, resolution, and sensitivity.

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