

# Fundamental physics in the cosmos: The early, the large and the dark Universe



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**Fundamental physics in the cosmos:  
The early, the large and the dark Universe**

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## The Dark Sequential Z' portal: Collider and Direct Detection Experiments

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We revisit the status of a Majorana fermion as a dark matter candidate, when a sequential Z' gauge boson dictates the dark matter phenomenology. Direct dark matter detection signatures rise from dark matter-nucleus scatterings at bubble chamber and liquid xenon detectors, and from the flux of neutrinos from the Sun measured by the IceCube experiment, which is governed by the spin-dependent dark matter-nucleus scattering. On the collider side, LHC searches for dilepton and mono-jet + missing energy signals play an important role. The relic density and perturbativity requirements are also addressed. By exploiting the dark matter complementarity we outline the region of parameter space where one can successfully have a Majorana dark matter particle in light of current and planned experimental sensitivities.

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