Dipartimento di Fisica
Università di Cagliari
INFN, Sezione di Cagliari

High Energy Physics Colloquia

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TRIUNF Collaboration, Vancouver

The Reverse Rutherford Era

Abstract

Dark matter – the invisible substance that makes up four-fifths of all matter – is ubiquitous, yet efforts to identify its microscopic nature have proven elusive. As it is known to move at high speeds, a promising approach to detect it is to observe unusual effects of its scattering on well-understood stationary targets, essentially the Rutherford scattering experiment in reverse. I will outline two experiments for the near future:

1. Through scattering, dark matter could set ancient neutron stars on fire, which may be observed by upcoming infrared telescopes such as James Webb, the Thirty Meter Telescope, and the Extremely Large Telescope; this would be the most extensive method to date for detecting dark matter.
2. One reason for why dedicated detectors on Earth looking for dark matter particles have found none so far could be that these particles are very dilute, at least kilometres apart. If so, new strategies could be used to catch them at meter-scale detectors such as DEAP, XENON and PICO, and by repurposing larger neutrino detectors such as BOREXINO, SNO+, and JUNO.

External Link:

Presentation room here

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