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What we believe to be known in direct Dark Matter detection physics might be incorrect

In this talk, I will revisit some fundamental well-known knowledge in direct Dark Matter detection physics, including: (1) the general expression for the differential event rate for elastic WIMP-nucleus scattering, (2) the minimal-required incoming velocity of incident WIMPs that can deposit the given energy in the detector, (3) the spatial distribution of the nuclear recoil angle, and provide detailed arguments from the perspective of Galactic Dark Matter particles impinging on our detectors, to show that there might be several "misunderstandings". As part of the proofs, numerical results based on our double Monte Carlo scattering-by-scattering simulation of 3-Dimensional elastic WIMP-nucleus scattering events will also be demonstrated.

Author: Dr SHAN, Chung-Lin

Presenter: Dr SHAN, Chung-Lin