INSTITUTE OF NUCLEAR AND PARTICLE PHYSICS

Colloquium

AI-based Methods in Astroparticle and Neutrino Research

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Artificial intelligence (AI) has increasingly gained ground in (astro)particle physics due to its efficiency in solving complex problems. In this talk, I will present AI-based methods used to improve the performance of two neutrino experiments: KM3NeT and ANNIE. KM3NeT is a large-scale research infrastructure hosting the next-generation neutrino telescopes, ARCA and ORCA. Located in the deep waters of the Mediterranean Sea, KM3NeT is designed to detect neutrinos from distant astrophysical sources and study their fundamental properties.

ANNIE is a smaller-scale neutrino detector located on the Booster Neutrino Beam at Fermilab. Its primary goal is to measure the neutron yield in the final state of neutrino–nucleus interactions—a measurement that could significantly improve our understanding of neutrino interactions and enhance signal–background discrimination in future neutrino detectors (such as Hyper-Kamiokande).

The talk will describe the AI techniques employed, with a focus on completed studies and published results.

Indico page https://indico.global/event/14748/
Videoconference via https://us02web.zoom.us/j/85279868843
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