



**HAMLET** August 19 - 21, 2024  
Copenhagen, Denmark  
How to Apply Machine Learning to  
Experimental & Theoretical  
**PHYSICS**

Contribution ID: 56

Type: **Plenary**

## **Keynote: Search for New Physics with Machine Learning: concepts, applications and recent progress**

*Monday, 19 August 2024 09:50 (55 minutes)*

The Standard Model of particle physics is an effective theoretical model remarkably describing matter particles and forces at the fundamental level. Despite its great success, it leaves many open questions such as the nature of Dark Matter and the origin for matter-antimatter asymmetry in the Universe.

The search for New Physics is a great challenge of contemporary science, which nonetheless has not been hitherto successful in recovering detectable signatures that could be distinguished from noise backgrounds in multi-dimensional datasets. Within this context, Machine Learning techniques have been deployed to overcome phenomenological challenges in the hunt for new particles.

The discovery of the Higgs boson has become perhaps one of the most striking example of the successful use of methods borrowed from Artificial Intelligence in high energy particle physics.

In this talk, I will overview the state-of-the-art, impeding issues and recent progress in development of advance Machine Learning methods and their applications in the ongoing searches for subtle new phenomena in fundamental physics.

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**Session Classification:** Plenaries & Keynotes