Kruger 2026: Discovery Physics at the LHC

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Theory Developments in Beyond-Standard-Model Physics

Despite the successful structural completion of the Standard Model (SM) of particle physics through the discovery of the Higgs boson, questions remain open that cannot be answered within the SM. Among these, two of the most prominent ones are those for the nature of Dark Matter (DM) and why there is more matter than antimatter in the universe. The answers to these (and also other) open questions require physics beyond the SM (BSM). So far, unfortunately, we do not have any direct sign of new physics. In this situation the role of the Higgs boson becomes extremely important as a door opener to the BSM landscape and as a dissection tool for its analysis. I will highlight in my talk the special role of the Higgs boson within both specific UV-complete models and within more model-independent effective field-theory approaches. I will discuss how it may guide our way in our quest for the model that allows us to describe nature and help us to understand the true picture behind it.

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