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Towards the next level of string phenomenology using machine learning

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String theory can be seen as the prime candidate for a consistent theory of gravity and particle physics. However, the task to explicitly construct a string model of particle physics that is in agreement with all experimental observations is very challenging due to the enormous size of the so-called string landscape of four-dimensional string models. In this talk, an overview of the heterotic orbifold landscape is given, where various techniques from machine learning are applied: i) an autoencoder neural network to identify structures in this landscape, ii) contrast patterns to construct new MSSM-like string models and iii) neural networks to predict the stringy origin of the MSSM. Moreover, by analyzing parts of the string landscape some novel ideas on flavor, CP and dark matter will be uncovered.

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