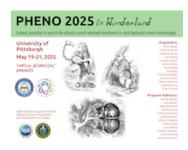Contribution ID: **160**   Type: **not specified**

Exploring the truth and beauty of theory landscapes with machine learning

Monday 19 May 2025 14:15 (15 minutes)

Theoretical physicists describe nature by i) building a theory model and ii) determining the model parameters. The latter step involves the dual aspect of both fitting to the existing experimental data and satisfying abstract criteria like beauty, naturalness, etc. We use the Yukawa quark sector as a toy example to demonstrate how both of those tasks can be accomplished with machine learning techniques. We propose loss functions whose minimization results in true models that are also beautiful as measured by three different criteria —uniformity, sparsity, or symmetry.

Mini Symposia (Invited Talks Only)

Plenary (Invited talks only)

Authors: MATCHEV, Konstantin (University of Alabama (US)); MATCHEVA, Katia (University of Alabama); RAMOND, Pierre Michel (University of Florida (US));   VERNER, Sarunas (University of Florida)

Presenter: MATCHEV, Konstantin (University of Alabama (US))

Session Classification: Flavor

Track Classification: Quark and Lepton Flavor Physics