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Recent Progress on the Gauge Theory Sector of F-Theory

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F-theory provides a geometric framework for engineering non-perturbation string vacua that have proven fruitful for the construction of GUT models for particle phenomenology. Its power in reliably extracting the physics of the strongly coupled string theory relies on the power of algebraic geometry. F-theory provides a dictionary between algebro-geometric properties of elliptically fibered Calabi-Yau manifolds and the lower-dimensional string theory effective action. In my talk, I will discuss recent progress in extracting the data of the gauge theory sector of the F-theory effective theories. In particular, I will focus on the construction of the Abelian sector of the theory as well as discrete gauge symmetry realizations in F-theory. Applications to particle phenomenology are discussed briefly and connections to recent developments in mathematics are highlighted.

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