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On the landscape of standard-model bundles on non-simply connected Calabi–Yau threefolds

Let X be a smooth Calabi–Yau threefold of Schoen’s type, *i.e.*, a fiber product of two rational elliptic surfaces over \mathbb{P}^1 . We classify all pairs (X, G) , where G is a finite group acting freely on X , such that the quotient X/G is a non-simply connected torus-fibered Calabi–Yau threefold. We also systematize the construction of stable G -invariant vector bundles on X with structure group $SU(4)$ or $SU(5)$. This work is motivated by the search for vacua of heterotic string theory yielding realistic four-dimensional physics, and the study of the landscape of such heterotic vacua.

This is joint work with Ron Donagi.