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Elliptic Fibration Structure of Toric Hypersurface Calabi-Yaus

Tuesday, 3 June 2025 11:30 (1 hour)

This talk will describe the results of a comprehensive analysis of manifest elliptic fibers in toric hypersurface Calabi-Yau threefolds. Previous work with Huang showed that all but 29,223 of the 474 million reflexive 4D polytopes in the Kreuzer-Skarke database admit a toric elliptic fiber. In recent work with Abbasi and Nally we have classified all toric fiber + base combinations. This talk will summarize this classification and describe a number of features including typical bases and fibers, high-rank SCFT's, singular bases without SCFT's, and implicit non-toric structure for gauge divisors and bases. A key take away is that elliptic fibrations provide a powerful framework for analyzing and understanding the structure of most known Calabi-Yau threefolds.

Presenter: TAYLOR, Washington (MIT)