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On topological invariants of elliptic fibrations
Abstract: A regime of string theory referred to by physicists as 'F-theory' exploits the geometry of elliptically fibered Calabi-Yau fourfolds to model the purported extra dimensions of space-time. As such, topological invariants of the total space of these fibrations often have physical meaning, as the topology of the extra dimensions constrain the manner in which strings can propagate within the fourfold. Moreover, a duality between F-theory and type-IIB predicts certain relationships between invariants of the total space of the elliptic fibration and invariants of the base. Keeping in line with the prophetic nature of string theory, these relationships seem to hold in a much more general context, i.e., they hold for elliptic fibrations over a base of arbitrary dimension without any Calabi-Yau hypothesis on the total space of the fibration.