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Mayuko Yamashita: Topological modular forms and heterotic string theory

Monday 28 August 2023 11:15 (1 hour)

In this talk I will explain my works with Y. Tachikawa to study anomaly in heterotic string theory via homotopy theory, especially the theory of Topological Modular Forms (TMF). TMF is an E-infinity ring spectrum which is conjectured by Stolz-Teichner to classify two-dimensional supersymmetric quantum field theories in physics. In the previous work (<https://arxiv.org/abs/2108.13542>), we proved the vanishing of anomalies in heterotic string theory mathematically by using TMF.

Furthermore, we have a recent update (<https://arxiv.org/abs/2305.06196>) on the previous work. Because of the vanishing result, we can consider a secondary transformation of spectra, which is shown to coincide with the Anderson self-duality morphism of TMF. This allows us to detect subtle torsion phenomena in TMF by differential-geometric ways.