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Anomalies, generalized symmetries, and compactifications

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Anomalies and symmetries play key roles in understanding QFTs. Compactification, which relates theories in different spacetime dimensions, offers valuable insights as well. In this talk, I will address some aspects of the behaviour of anomalies and generalized symmetries under compactification. I will first explain how the anomalies for finite higher-form symmetries of the lower dimensional theory can be obtained by integrating the anomaly theory of the higher dimensional theory on the compact surface. Then, I will discuss the fate of various generalized symmetry structures (2-group and non-invertible symmetries) in 4d models upon compactification on a 2-sphere. These structures tend to trivialize in 2d, but they can still leave an imprint in terms of 't Hooft anomalies or symmetry breaking patterns. While tested in supersymmetric models, these concepts are applicable to non-supersymmetric theories too.

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