# Decomposition, anomalies, and quantum symmetries

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Decomposition is a phenomenon in quantum physics which converts quantum field theories with non-effectively acting gauge symmetries into equivalent more tractable theories in which the fields live on a disconnected space. I will explain the mathematical content of decomposition which turns out to be a higher categorical version of Pontryagin duality. I will show how this duality interacts with quantum anomalies and secondary quantum symmetries and will show how the anomalies can be canceled by homotopy coherent actions of diagrams of groups. I will discuss in detail the case of 2-groupoids which plays a central role in anomaly cancellation, and will describe a new duality operation that yields decomposition in the presence of anomalies. This is a joint work with Eric Sharpe.