

# Topological Abelian Duality

Leon Liu

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Abelian duality is a major theme in both mathematics and physics, namely representation theory and quantum field theories. In this mini-course, we will explore a homotopic version of abelian duality through the lense of topological field theories. Moreover, we will see how field theories behaves like sheaves and generalize the abelian duality theory to more general (homotopic) situations.

## Day 1

In today's lecture, we will first review abelian duality in representation theory, namely representation theory of finite abelian groups, as equivalences of categories of different levels. Then we will briefly review abelian duality in QFTs of different dimensions. Then we will see how to interpret the equivalences of categories as equivalences of field theories and state the main theorem. Lastly, we will review the basics of topological field theories.