Symmetry Protected Topological States of Interacting Fermions and Bosons YI-ZHUANG YOU, CENKE XU, University of California, Santa Barbara — We study the classification for a large class of interacting fermionic and bosonic symmetry protected topological (SPT) states. We define a SPT state as whether or not it is separated from the trivial state through a bulk phase transition, which is a general definition applicable to SPT states with or without spatial symmetries. We show that in all dimensions short range interactions can reduce the classification of free fermion SPT states, and we demonstrate these results by making connection between fermionic and bosonic SPT states. We first demonstrate that our formalism gives the correct classification for several known SPT states, with or without interaction, then we will generalize our method to SPT states that involve the spatial inversion symmetry.

Yizhuang You
University of California, Santa Barbara