Abstract

In this talk, I will introduce our recent progress on quantum Fourier analysis. We unify and establish various quantum inequalities such as Young’ s inequality, reverse Young’ s inequality, (smooth) entropic convolution inequality, etc., on quantum symmetries. We prove a family of primary criteria for unitary categorification of fusion rings basis on the complete positivity of comultiplication, which are stronger than the Schur product criterion. Localized versions of primary criteria are applicable to check fusion rings with incomplete data. Further more, these criteria could be applied as analytic obstructions for principal graphs of subfactors.