Rubio de Francia Extrapolation: From Scalar to Matrix Weighted Spaces

Fatih Şirin (Haliç University)

Abstract: The theory of weighted inequalities is a foundational component of modern harmonic analysis. The Rubio de Francia extrapolation theorem provides a powerful principle: the boundedness of an operator on a single weighted Lebesgue space for all Muckenhoupt weights implies corresponding bounds on for every . This theorem offers a unified framework for many classical estimates. In this talk, we will first review the classical extrapolation theory in the scalar- weighted setting, highlighting the structure of weights and the role of the Hardy–Littlewood maximal operator. We then introduce the extension of extrapolation methods to matrix weights, where new geometric and analytic challenges arise. The matrix-weighted framework allows us to study vector-valued operators and yields broad applications to singular integral theory.

Date: 14 November 2025, Friday

Time: 13:00

Place: Seminar Room