

New Hardy Spaces, Singular Integrals, and the Neumann Problem

Pedro Takemura

Baylor University - USA

In this talk we introduce a new brand of Hardy spaces, referred to as Beurling-Hardy Spaces associated with a Generalized Banach Function Space (GBFS). We develop a Calderón–Zygmund theory for singular integral operators acting on (and from) these spaces. This opens the door for implementing layer potential techniques to treat the Neumann Problem for weakly elliptic systems in uniformly rectifiable domains, with boundary data in GBFS-based Beurling-Hardy spaces. This is joint work with Marius Mitrea.

In Special Session 44 on Recent Advances in Harmonic Analysis, Partial Differential Equations, and Geometric Measure Theory at the Mathematical Congress of the Americas 2025.