SIMION STOILOW INSTITUTE OF MATHEMATICS OF THE ROMANIAN ACADEMY

Potential Theory Seminar

On the resonant Carleson-Radon transform

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Tuesday, February 17, 2026, 14:00

IMAR, *Miron Nicolescu* Amphitheater

Abstract: In this talk we discuss the history and evolution of a two-decade reasearch investigation concerning the boundedness properties of the so-called **Carleson-Radon transform**, which, in *one dimension*, is defined as

$$CR(f)(x,y) := \sup_{a\in\mathbb{R}} \left| \text{p.v.} \int_{\mathbb{R}} f(x-t^{\alpha_1}, y-t^{\alpha_2}) \, \frac{e^{a\,i\,t^{\alpha_3}}}{t} \, dt \right|, \quad (x,y)\in\mathbb{R}^2\,, \tag{1}$$

where here $\{a_j\}_{j=1}^3 \subset (0,\infty)$.

In spite of some moderate progress in the *higher dimensional* context—which as it turns out is easier—until recently, very little was known about the *one dimensional* object in (1).

In a previous talk we presented the resolution of the **one dimensional non-resonant** (non-zero curvature) Carleson-Radon transform which corresponds in (1) to the case $\{\alpha_j\}_{j=1}^3$ pairwise distinct.

In this talk we are going to discuss the first fundamental progress in the **one-dimensional resonant** (zero-curvature) setting corresponding to the case when $\alpha_2 = \alpha_3$ and different from α_1.

Both the former and the latter works are joint with my graduate student Martin Hsu.