UNIVERSITY AT ALBANY
State University of New York

College of Arts and Sciences
Department of Mathematics and Statistics

Colloquium

Karin Reinhold–Larsson
University at Albany, SUNY

The Ritt Property for Contraction Operators and Square Functions in L^1

Friday, November 4, 2022
3:00 p.m. in BB-B012
(tea & coffee at 2:45 p.m.)

Abstract. The problem of convergence and rate of convergence of powers of contraction operators T^n has fascinated mathematicians. In recent years, advancements for operators satisfying the following Ritt condition:

$$\sup_n n\|T^n - T^{n+1}\| < \infty,$$

were obtained using a Cauchy integral representation for operators for functions in L^p, for $1 < p < \infty$. We will present the history of the problem, with spectral requirements for pointwise convergence and the boundedness of a square functions such as $\sum_n n|T^n f - T^{n+1} f|^2$. Unfortunately, the methods did not extend to L^1. However, positive results are obtained for the following particular case: let μ be a probability measure in the integers, and $\tau : X \to X$ a measure preserving transformation. Define

$$T_\mu(f)(x) = \sum_{k=-\infty}^{\infty} \mu(k) f(\tau^k x).$$

We'll discuss necessary conditions on the measure μ that yield the Ritt property and convergence of certain squares functions in L^1.