

Simons Focus Group

„SPECTRAL THEORY: IN DEPTH, AROUND, AND BEYOND”

(LEADER: A. BORICHEV)

LECTURE COURSES:

Alexander Borichev (Marseille University)

Title: "Zeros of Taylor series with random and pseudo-random coefficients"

Abstract: For different classes of random (independent, stationary, random arithmetic sequences) and pseudo-random (exponential-polynomial, Rudin-Shapiro, Thue-Morse sequences) coefficients, we study the zero distribution of the corresponding Taylor series. We deal both with global and local behavior of the zero sets. Some related questions include the Szego-type weighted polynomial approximation problems and the rigidity of stationary processes under spectral measure support restrictions.

SCHEDULE:

**MONDAY, 30 MAY,
ZOOM, FOR DETAILS ASK
Y. TOMILOV:**

15:00 - 16:30 A. BORICHEV

**TUESDAY, JUNE 7,
ROOM 321 IM PAN:**

14:00-15.30 M. TUCSNAK

16:00 - 17.30 V. MÜLLER

THURSDAY, JUNE 9,

ROOM 321 IM PAN:

14:00 - 15.30 M. TUCSNAK

16:00 - 17.30 V. MÜLLER



Vladimir Müller (Institute of Mathematics of the Czech Academy of Sciences)

Title: „Invariant subspace problem”

Abstract: The invariant subspace problem is the most important open problem of operator theory. We give a survey of known results (both positive and negative) concerning this problem.

Marius Tucsnak (Bordeaux University)

Title: “Spectral and complex analytic methods for the observation and control of infinite dimensional linear systems”

Abstract: We begin by introducing the notion of wellposed linear time invariant dynamical system, in the presence of inputs and outputs. We next define the fundamental notion of reachable space, followed by the introduction of the main controllability and observability systems. The exact controllability and observability of systems with skew-adjoint generator are then analyzed from a spectral perspective, with various examples coming from PDEs. We next come back to the study of the reachable space for infinite dimensional systems, with focus on those described by parabolic partial differential equations and on recently established connections with the theory of Hilbert spaces of holomorphic functions.