The College of Arts & Sciences
Department of Mathematical Sciences

Colloquium

Professor Maxim Yattselev

Indiana University–Purdue University Indianapolis

Thursday, November 16th 2023
Room 220, 60W Charlton
4:00 – 5:00 pm

Spectral Theory Behind Multiple Orthogonal Polynomials

It is known that monic polynomials orthogonal with respect to a compactly supported non–trivial Borel measure on the real line satisfy three–term recurrence relations with coefficients that are uniformly bounded. The coefficients then can be used to define a bounded operator on the space of square–summable sequences. This operator can be symmetrized and the spectral measure of the symmetrized operator is in fact the measure of orthogonality of the polynomials themselves. One way of arriving at the subject of orthogonal polynomials is via Padé approximation (Padé approximants are rational interpolants of a given holomorphic function; when the function is a Cauchy transform of a Borel measure on the real line, the denominators of the approximants are the orthogonal polynomials). Padé approximants can be extended to the setting of a vector of holomorphic functions and a vector of rational interpolants (this construction was introduced by Hermite to prove transcendence of e). Vector rational interpolants naturally lead to multiple orthogonal polynomials. After developing the above mentioned motivations, I shall describe some of the recent advancements in spectral theory of multiple orthogonal polynomials.

Refreshments will be served 3:15 – 3:45 pm in the Faculty Lounge
4118 French Hall West

UNIVERSITY OF Cincinnati