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Monday, January 28, 2019

Time: 4:00 p.m.

Location: Weber 223

Title: Is there a spectral theory behind multiple orthogonal polynomials?

Abstract: This is a talk about orthogonal polynomials (OPs) and their generalization to the setting of multiple measures. I will start by reminding the classical applications of OPs: series expansion of functions (similar to Fourier series), quadrature formulae, rational interpolation (also known as Padé approximation) arising through the mechanism of continued fractions (applied to irrational numbers this mechanism produces “best” rational approximants). I will finish the first part by explaining the basics of the spectral theory of OPs: characterization of the measure of orthogonality as the spectral measure of a certain Jacobi operator. Padé approximants were initially introduced by Hermite in their vector form (now known as Hermite-Padé approximants) as a tool in proving transcendence of the number  $e$  (I will briefly outline the idea of the proof). Hermite-Padé approximants naturally lead to multiple orthogonal polynomials (MOPs). As of now, there are no complete spectral theory of MOPs. As much as time permits, I will explain recent advances on this topic due to A.I. Aptekarev, S. Denisov, and myself.

