Sean Redinger – MS Talk

Title: The Heat Polynomial and Its Zeros

Abstract: The heat polynomials are weighted homogeneous polynomials which arise as solutions of the complex two-dimensional heat equation. The heat polynomials themselves have several interesting properties, including being closely related to the Hermite polynomials, but the main objects of interest are the zeros of these polynomials, which, under appropriate conditions, are either all real or all purely imaginary. These zeros will be shown to evolve over time, satisfying a dynamical system which is also studied in relation to moving poles of the complex Burgers' equation, vortex dynamics, and the Riemann hypothesis. The connection to the KPI equation is also illustrated.