

DREXEL ANALYSIS SEMINAR

December 2, 2022

**2-3 PM, remote talk**

**Speaker:** Jakob Moosbauer (Johannes Kepler University, Austria)

**Title:** Flip Graphs for Matrix Multiplication

**Abstract:** The cost of matrix multiplication remains one of the big open questions in algebraic complexity theory. In 1969 Strassen discovered a multiplication scheme that computes the product of two  $2 \times 2$  matrices using only 7 multiplications in the ground ring. In this talk I will present a method for discovering new matrix multiplication schemes based on random walks in a certain graph which we call the flip graph. Using this method we were able to reduce the number of multiplications for the matrix formats  $\langle 4, 4, 5 \rangle$  and  $\langle 5, 5, 5 \rangle$ , both in characteristic two and for arbitrary ground rings.