

Speaker: Dhruv Ranganathan

Title: Graphs, logarithmic structures, and the equations of curves

Abstract: I will discuss ideas related to the the space of equations of algebraic curves and specifically, joint work with Dave Jensen in which we determine the dimension of the space of linear systems on general curves of a fixed gonality. This result generalizes the Brill-Noether theorem due to Griffiths and Harris in the 1980s. The method blends two strands of tropical geometry that have developed largely in parallel over the last few years: the combinatorial theory of chip-firing on graphs on the one hand and the theories of logarithmic and tropical stable maps on the other.

In the pre-talk, I will discuss Riemann-Roch theory for graphs following Baker and Norine, and outline how this theory leads to proofs of results in algebraic geometry, including the Brill-Noether theorem. I will also mention some open problems on the combinatorial side. In the first part of the main talk, I will state the Brill-Noether theorem for curves of fixed gonality and the strategy for its proof. Finally, I will explain the crucial role that logarithmic structures play in executing that proof.