Algebraic curves, tropical geometry, and moduli

Sam Payne
Yale University

Abstract:
Tropical geometry gives a new approach to understanding old questions about algebraic curves and their moduli spaces, synthesizing techniques that range from Berkovich spaces to elementary combinatorics. I will discuss an outline of this method, understanding the general fiber of a degenerating family of curves in terms of the dual graph of its special fiber, along with a range of applications that includes new results on the topology of the moduli space of curves, new proofs of the fundamental theorems in the geometry of linear series, and a new result about the Hilbert function of the general curve of fixed degree and genus in projective space.