

Weighted Ehrhart Theories

Esme Bajo
UC Berkeley

Abstract

Ehrhart theory – the study of lattice point enumeration in polytopes with rational vertices – can be used to study various combinatorial objects, including posets and graphs. In this talk, we explore two weighted versions of Ehrhart theory. We first ask which polynomial weights we can apply to our lattice so that the associated weighted h^* -polynomials retain some of their classical properties, such as nonnegativity and monotonicity. We also study a second weighted Ehrhart theory, Chapoton’s q -analog Ehrhart theory, and discuss its relationship to the principal specialization of Stanley’s chromatic symmetric function. The first project is joint work with Robert Davis, Jesús A. De Loera, Alexey Garber, Sofía Garzón Mora, Katharina Jochemko, and Josephine Yu, and the second project is joint work with Matthias Beck and Andrés R. Vindas Meléndez.