1176-13-168   **James Lewis*** (`jl2826@cornell.edu`). *Hyperplane Arrangements and the Rational Powers of Monomial Ideals.*

We discuss the rational powers of ideals. In the case of monomial ideals, a filtration of monomial ideals defined by a hyperplane arrangement leads to a characterization of the rational powers of monomial ideals. The hyperplane arrangement filtration refines the integral closure power filtration, a further connection between integral closures and convex geometry via the Newton Polyhedron. The connection yields that symbolic powers of squarefree monomial ideals are indeed rational powers themselves. We briefly discuss the convergence of asymptotic homological invariants for rational powers, such as depth and normalized Castelnuovo-Mumford regularities. Additionally, we find that the normalized lengths of local cohomology modules converge for rational powers, and hence for symbolic powers of squarefree monomial ideals. (Received January 21, 2022)