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Geometry and Algebra associated to Hyperplane Arrangements

The geometry and combinatorics of hyperplane arrangements define an associative product on the faces of the arrangement and is used in determining various properties of the resulting semigroup algebra. In turn, the properties of the algebra afford geometric and combinatorial results about the arrangement. An example of this interplay is the result that the face semigroup algebra depends only on the intersection lattice of the hyperplane arrangement. It is obtained by constructing the quiver of the face semigroup algebra using the geometry of the hyperplane arrangement.