

Convex geometry of building sets

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Building sets were introduced in the study of wonderful compactifications of hyperplane arrangement complements and were later generalized to finite meet-semilattices. Convex geometries, the duals of antimatroids, offer a robust combinatorial abstraction of convexity. Supersolvable convex geometries and antimatroids appear in the study of poset closure operators, Coxeter groups, and matroid activities. We prove that the building sets on a finite meet-semilattice form a supersolvable convex geometry. As an application, we demonstrate that building sets and nested set complexes respect certain restrictions of finite meet-semilattices unifying and extending results of several authors.

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