1156-52-151 **Steven Simon*** (`ssimon@bard.edu`). *Orbit Polytope Partitions of a Tverberg Type.*

Tverberg's Theorem, a foundation of convex and discrete geometry, states that any $T(r,d) := (r-1)(d+1)+1$ points in $\mathbb{R}^d$ can be partitioned into r subsets whose convex hulls have non-empty r-fold intersection. The number $T(r,d)$ is very tight in that any generic collection of fewer points cannot be so divided, and in such circumstances it is natural to search for weaker symmetry on the convex hulls. Our central result guarantees the following such condition: if G is any finite group and $\rho : G \to O(d)$ is any faithful orthogonal representation not containing the trivial representation, then almost any $N(G,\rho;d) := T(|G|,d) - d$ points in $\mathbb{R}^d$ can be partitioned by $|G|$ subsets so that there are $|G|$ points, one from each of the $|G|$ resulting convex hulls, which form a full G-orbit and the vertex set of of a (necessarily vertex transitive) generic orbit polytope. Again, the number $N(G,\rho;d)$ is optimal in the strong sense above. In low dimensions, these points may be taken to be the vertices of any regular polygon in the plane; of nearly uniform copies of all regular prisms, the icosahedra, and five of the Archimedean solids in three-space; and infinitely many facet transitive four-polytopes, three of which are regular. (Received January 24, 2020)