1176-52-292 **Steven Simon*** (`ssimon@bard.edu`). *Inscribed Tverberg-type theorems for orbit polytopes.*

Tverberg's theorem states that any set of $T(r,d) = (r-1)(d+1)+1$ points in $\mathbb{R}^d$ can be partitioned into r subsets whose convex hulls have non-empty r-fold intersection. Moreover, any generic collection of fewer points cannot be so divided. Extending earlier work of the first author, we show that in many such circumstances one can still guarantee inscribed "polytopal partitions" with specified symmetry conditions. Namely, for any faithful and full–dimensional d-dimensional orthogonal G-representation of a given group G of order r, we show that a generic set of $T(r,d) - d$ points in $\mathbb{R}^d$ can be partitioned into r subsets so that there are r points, one from each of the resulting convex hulls, which are the vertices of a convex d–polytope whose isometry group contains G via a regular action afforded by the representation. As with Tverberg's theorem, the number of points is tight for this. At one extreme, this gives polytopal partitions for all regular r–gons in the plane as well as for three of the six regular 4–polytopes in $\mathbb{R}^4$. On the other hand, one has polytopal partitions for d-polytopes on r vertices with isometry group equal to G whenever G is the isometry group of a vertex–transitive d-polytope. (Received January 25, 2022)