1173-52-39 **Steven Simon*** (ssimon@bard.edu). *Inscribed polytopal partitions of a Tverberg-type.*

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 with overlapping convex hulls. While almost any collection of fewer points cannot be so divided, we show that in many such circumstances one can nonetheless guarantee tight inscribed "polytopal partitions" with prescribed symmetry conditions. Namely, given any group G of order r and any faithful and full–dimensional orthogonal d–dimensional representation, we show that any generic set of $T(r,d) - d$ points in $\mathbb{R}^d$ can be partitioned by r subsets so that there are r points, one from each of the r resulting convex hulls, which are the vertex set of a d–dimensional polytope whose isometry group contains G via a free and transitive action afforded by the representation. At one extreme, this gives polytopal partitions for all regular r–gons in the plane [ ] and three of the six regular 4–polytopes in $\mathbb{R}^4$. At the other, one has polytopal partitions for polytopes on $|G|$ vertices with isometry group G whenever G is the isometry group of a vertex–transitive polytope. As with Tverberg's theorem, our results admit topological extensions when G is elementary abelian of prime power order. (Received September 10, 2021)