

Chiral Polytopes

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A chiral polytope is "half-regular": its automorphism groups has two orbits on the flags, such that adjacent flags are in different orbits. Chiral polytopes are somewhat harder to find than regular (abstract) polytopes, and we only found out very recently that there are chiral polytopes of any rank $n \geq 3$. In the first part of this talk, we will define chiral and directly regular polytopes, drawing connections with the theory of regular polytopes. In the second part, we will use the idea of the smallest regular cover of a chiral polytope to motivate the mixing and splitting operations, two ways to combine polytopes to create a new polytope. Finally, we will see some nice results that help us identify when the mix of two polytopes will be chiral.