Chiral and Regular Polytopes in Low Dimensions

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There are two main thrusts in the theory of chiral and regular polytopes: the abstract, purely combinatorial aspect, and the geometric one of realizations. We summarize recent progress on the realization theory in euclidean spaces of low dimensions, focusing on the complete enumeration of the discrete chiral polyhedra in ordinary 3-space. The latter are the chiral analogues of the Grunbaum-Dress polyhedra, these being the regular polyhedra in 3-space.