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Isotopies of Latin tableaux.

Latin tableaux are a generalization of Latin squares, first introduced in 2002 by Chow, Fan, Goemans, and Vondrak. Chow and his collaborators hoped to use Latin tableaux to prove Rota's basis conjecture—a question in linear algebra which has been open since the early 1990's. In this talk, we give an overview of Latin tableaux and their tantalizing connection to linear algebra. We then present some new combinatorial results about Latin tableaux. We extend the notion of *isotopy*, a permutation group action, from Latin squares to Latin tableaux. We define *isotopy graphs* for Latin tableaux, which encode the structure of orbits under the isotopy action, and investigate the relationship between the shape of a Latin tableau and the structure of its isotopy graph. We show, for example, that for any positive integer d , there is a Latin tableau whose isotopy graph is a d -dimensional cube. (Received January 19, 2021)