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**Barry Monson**, University of New Brunswick, Department of Mathematics, Fredericton, NB E3B 5A3, Canada, and **Egon Schulte\***, Northeastern University, Department of Mathematics, Boston, MA 02115. *The Assembly Problem for Alternating Semiregular Polytopes*. Preliminary report.

In the classical setting, a convex polytope is semiregular if its facets are regular and its symmetry group is transitive on vertices. The lecture is about semiregular abstract polytopes, which have abstract regular facets, still with combinatorial automorphism group transitive on vertices. We focus in particular on alternating semiregular polytopes, with two kinds of regular facets occurring in an alternating fashion. Group amalgamations can be used to prove that given two compatible regular  $n$ -polytopes  $P$  and  $Q$ , there exists a universal alternating semiregular  $(n+1)$ -polytope  $U$  which is obtained by freely assembling alternate copies of  $P$  and  $Q$ . We investigate in what circumstances we can have  $k$  copies each of  $P$  and  $Q$  alternate as the facets of a semiregular  $(n+1)$ -polytope  $S$ . In some fairly broad situations we can construct the polytope  $S$ . However, there are instances of "bad behaviour", with obstructions already existing when  $k=2$ . (Received January 27, 2020)