Descriptive classification of abelian orbit equivalence relations.

We give a brief introduction to descriptive classification theory and discuss some recent results and conjectures regarding the classification under Borel reduction of the orbit equivalence relations which are induced by Borel actions of abelian Polish and standard Borel groups. It was shown by Gao and Jackson that the orbit equivalence relations induced by any Borel action of a countable abelian group must be hyperfinite, i.e., achievable with the orbits of a Borel $\mathbb{Z}$-action, and this result has been generalized further by others. However, the case where the group is abelian but not countable remains fruitful. We conclude that locally compact abelian Polish groups induce relations which still reduce to hyperfinite, but beyond that many questions are still open. (Received September 16, 2019)