Universal models for classes of abelian groups for purity

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The search for universal models began in the early twentieth century when Hausdorff showed that there is a universal linear order of cardinality $\aleph_{n+1}$ if $2^{\aleph_n} = \aleph_{n+1}$, i.e., a linear order U of cardinality $\aleph_{n+1}$ such that every linear order of cardinality $\aleph_{n+1}$ embeds in U. In this talk, we will study universal models in classes of abelian groups with respect to pure embeddings.

We will present a complete solution below $\aleph_\omega$ to Problem 5.1 in page 181 of *Abelian Groups* by László Fuchs, which asks to find the cardinals λ such that there is a universal abelian p-group for purity of cardinality λ. The solution presented will use both model-theoretic and set-theoretic ideas. The talk will be mostly based on [Maz21], but we will mention a recent result which is joint work with Ivo Herzog.

References

[Maz21] Marcos Mazari-Armida, *A model theoretic solution to a problem of László Fuchs*, Journal of Algebra **567** (2021), 196–209.

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