The large-scale geometry of LCA groups

Nicolò Zava*, Dmitri Shakhmatov, Takamitsu Yamauchi

nicolo.zava@gmail.com,
shakhmatov.dmitri.mx@ehime-u.ac.jp,
yamauchi.takamitsu.ts@ehime-u.ac.jp

Large-scale geometry, also known as coarse geometry, is the branch of mathematics that studies global, large-scale properties of spaces. Since the breakthrough work of Gromov, large-scale geometry has played a prominent role in geometric group theory and, in particular, in the study of finitely generated groups and their word metrics. This large-scale metric approach was successfully extended up to the class of locally compact σ-compact groups by Cornulier and de la Harpe. To study more general topological groups, coarse structures, introduced by Roe as the large-scale counterpart of uniformities, are required. In this presentation, we focus on the compact-group coarse structure, induced by the family of compact subsets, and the left-coarse structure, introduced by Rosendal, in the class of locally compact abelian groups.

During the first part of the talk, we present results concerning the compact-group coarse structure, emphasising the role of Pontryagin duality as a bridge between topological properties and their large-scale counterparts. Then, we discuss the relation between the compact-group coarse structure and the left-coarse structure, showing that they coincide in this class. To conclude, we apply this result to the theory of Banach spaces.

TOPOSYM
Prague 2022