

GEOMETRIC MEASURE THEORY IN HEISENBERG GROUPS

Heisenberg groups are noncommutative Lie groups that can be endowed with a left-invariant distance so that the resulting metric space does not bi-Lipschitzly embed into any Euclidean space. Geometric measure theory in these spaces has been studied since the late 1990s as part of a program aimed at generalizing the existing theory beyond the Euclidean framework. While interesting in its own right, geometric measure theory in Heisenberg groups has found surprising applications in other fields, for instance in computer science (most recently in the work of A. Naor and R. Young). The aim of this minicourse is to introduce some building blocks for geometric measure theory in Heisenberg groups – vertical projections, intrinsic Lipschitz graphs, horizontal and vertical perimeter – and to indicate various applications.