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Equivariant geometry of Alexandrov 3-spaces.

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Alexandrov spaces constitute a synthetic generalization of Riemannian manifolds with a lower bound on sectional curvature. They provide a natural metric setting to study notions of global Riemannian geometry, and therefore, a fundamental problem is that of extending to Alexandrov spaces what is known for Riemannian manifolds. As in the Riemannian case, one may investigate Alexandrov spaces via their symmetries. Since the isometry group of a compact Alexandrov space is a compact Lie group, this point of view naturally leads to the study of isometric Lie group actions on Alexandrov spaces. In this context, a natural measure of the complexity of an action is the cohomogeneity, i.e. the dimension of the orbit space. Berestovskii showed that finite-dimensional homogeneous Alexandrov spaces actually are Riemannian manifolds. Galaz-Garcia and Searle studied Alexandrov spaces of cohomogeneity 1 and classified them in dimensions at most 4.

In this talk I will present an equivariant and topological classification of closed Alexandrov spaces of dimension 3 admitting isometric actions of cohomogeneity 2 as well as a generalization to the case of isometric local circle actions. As an application of this result I will talk about some aspects of the geometry (in the sense of Thurston) of Alexandrov 3-spaces. The results presented here are joint work with Fernando Galaz-García and Luis Guijarro.

Presenter: Prof. NÚÑEZ-ZIMBRÓN, Jesus ((University of California, Santa Barbara, USA)