

15th Annual Workshop on Topology and Dynamical Systems
Nipissing University, May 21–25, 2018
<http://topology.nipissingu.ca/workshop2018/>

The Borel conjecture through controlled G-theory

Boris Goldfarb (University at Albany, State University of New York)
bgoldfarb@albany.edu

Abstract: I will describe the joint work with Gunnar Carlsson on the old conjecture of Armand Borel in topology. The conjecture states that if a closed aspherical manifold M is homotopy equivalent to another manifold then the two manifolds must be homeomorphic. The aspherical condition is equivalent to the universal cover of M being contractible, which is common in geometry. Our approach studies the K-theoretic assembly map associated to $\pi_1(M)$ by factoring it through a controlled version of Grothendieck's G-theory of the group ring $\mathbb{Z}[\pi_1(M)]$. The G-theory turns out to be easier to compute and is equivalent to K-theory in very general geometric situations, for example when $\pi_1(M)$ has finite decomposition complexity.