

# Models for non-simply-connected homotopy theory

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## Abstract

In algebraic topology one often tries to model spaces by algebraic objects. This has been done in many interesting cases, but there are almost always strong assumptions on the fundamental group of the spaces, it can be nilpotent at best. In this talk I explain how some of these results can be extended to non-simply-connected spaces.

Recently Manuel Rivera and Mahmoud Zeinalian have shown that it is possible to extract the fundamental group of a space from its singular chains. This remarkable discovery makes it possible to model non-simply-connected spaces. In this talk I will explain how the simplicial coalgebra of chains determines a space one prime at a time. In particular I will show that the fiberwise Bousfield localizations of two connected spaces are weakly equivalent if and only if the cocommutative coalgebras of chains are equivalent in some sense called Omega-quasi-isomorphism. I'll further explain that when the spaces have universal covers which are of finite type, then the spaces are weakly homotopy equivalent if and only if the simplicial chains with integer coefficients are Omega-quasi-isomorphic. This is joint work with Manuel Rivera and Mahmoud Zeinalian.