Hellen Colman, Wilbur Wright College, Chicago

Lusternik-Schnirelmann theory for orbifolds as Lie groupoids

We propose a new numerical invariant for Lie groupoids which generalizes the Lusternik-Schnirelmann category of topological spaces. This number is invariant under Morita equivalence, then yields a well defined $LS$-category for orbifolds.

An orbifold map is given by an equivalence class of generalized maps between Lie groupoids [3]. These generalized maps are obtained by formally inverting essential equivalences. We develop a notion of Morita homotopy between generalized maps and prove that the $LS$-category of a Lie groupoid is a homotopy invariant. We describe a bicategory of fractions where our notion of Morita homotopy equivalence amounts to isomorphism of objects and defines the orbifold homotopy type. Estimates for the $LS$-category of an orbifold relate to other numerical invariants such as Euler characteristic of a category [2] and groupoid cardinality [1].

References:


Contact address: hcolman@sbcglobal.net