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Hellen Colman* (hcolman@ccc.edu). *Lusternik-Schnirelmann category 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. These generalized maps are obtained by formally inverting essential equivalences. We develop a notion of Morita homotopy between generalized maps and prove that our LS-category of a Lie groupoid is a Morita homotopy invariant.

Estimates for the LS-category of an orbifold relate to other numerical invariants such as Euler characteristic of a category, groupoid cardinality and the stringy Euler characteristic of an orbifold. (Received February 21, 2009)