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Christopher L Rogers* (chrisrogers@unr.edu), Department of Mathematics and Statistics, University of Nevada, Reno, 1664 N. Virginia Street, Reno, NV 89557, and **Chenchang Zhu** (chenchang.zhu@gmail.com), Mathematisches Institut, Georg-August-Universität Göttingen, Bunsenstrasse 3–5, 37073 Göttingen, Germany. *Integrating quasi-isomorphisms between L_∞ -algebras.*

Lie ∞ -groupoids are simplicial Banach manifolds which satisfy conditions similar to the “horn filling” conditions for Kan complexes in the theory of simplicial sets. Lie ∞ -groupoids with only one object are called “Lie ∞ -groups”. These have been used to construct diffeo-geometric models for the higher stages of the Whitehead tower of the orthogonal group. With this goal in mind, A. Henriques developed a smooth analog of Sullivan’s realization functor from rational homotopy theory which produces a Lie ∞ -group from a finite type L_∞ -algebra.

In this talk, I will describe joint work in progress with C. Zhu (Göttingen) in which we develop a user-friendly homotopy theory for Lie ∞ -groups that is compatible with the homotopy theory of L_∞ -algebras. In particular, we show that Henriques’ integration functor sends quasi-isomorphisms between finite-type L_∞ -algebras to weak equivalences between their corresponding Lie ∞ -groups. (Received August 27, 2016)