1077-55-875 **Michael A Shulman*** (mshulman@ucsd.edu). *Cell complexes and inductive definitions.*
In recent work of Voevodsky, Awodey, and others, it has emerged that Martin-Löf's constructive type theory, originally conceived as a computational foundation for mathematics, can naturally be interpreted in homotopy theory. In particular, many standard theorems in homotopy theory can be proven inside of type theory, and thereby fully verified for correctness quite easily by a computer. This promises a fruitful interplay between the two disciplines, and potentially a new foundation for mathematics which is at once "homotopical" and "computational".

What is still missing, however, is a way to construct, in type theory, familiar spaces such as spheres, tori, manifolds, classifying spaces, Postnikov towers, and so on, which in homotopy theory we usually describe using cell complexes. In joint work with Peter Lumsdaine, we have shown that the type-theoretic notion of *inductive definition* admits a generalization that naturally includes all such constructions. I will describe the resulting notion, assuming no background in type theory, and explain how it matches homotopy-theoretic cell complexes and Quillen's small object argument. (Received September 13, 2011)