1135-18-191 **Emily Riehl*** (`eriehl@math.jhu.edu`), Department of Mathematics, 3400 N Charles Street, Baltimore, MD 21218, and **Michael Shulman**. *A synthetic theory of ∞-categories in homotopy type theory.*

Homotopy type theory grew out of a new model for intentional type theory in a category whose objects represent homotopy types or ∞-groupoids rather than sets and a new axiom asserting that "identity is equivalent to equivalence," which implies that all constructions are homotopy invariant. In this talk, we propose foundations for a synthetic theory of ∞-categories in homotopy type theory motivated by a particular model of homotopy type theory, which contains a well-known model of ∞-categories whose category theory can be developed synthetically — the "Rezk" or "complete Segal spaces." We introduce simplices to probe the internal categorical structure of types, and define Segal types, in which binary composites exist uniquely up to homotopy, and Rezk types, in which the categorical isomorphisms are equivalent to the type-theoretic identities — a "local univalence" condition. We then develop the synthetic theory of ∞-categories including functors, natural transformations, co- and contravariant type families with discrete fibers, a "dependent" Yoneda lemma that looks like "directed identity-elimination," and the theory of coherent adjunctions. (Received September 15, 2017)