

# Topology Seminar

**Emily Riehl**

of Harvard University will be speaking on

## The formal category theory of $(\infty, n)$ -categories

on February 9 at 4:30 in  
MIT Room 2-131

Pioneering work of Andre Joyal and Jacob Lurie has shown that ordinary category theory can be extended to quasi-categories (“ $\infty$ -categories”), a type of  $(\infty, 1)$ -category. In joint work with Verity, we show that the category theory of quasi-categories is 2-categorical: new definitions of the basic notions - (co)limits, adjunctions, fibrations - equivalent to the Joyal-Lurie definitions, can be encoded in the homotopy 2-category of quasi-categories. Our 2-categorical proofs in the homotopy 2-category restrict to the classical ones in the sub 2-category CAT. We give a short list of axioms, satisfied by (iterated) complete Segal spaces, that suffice for this homotopy 2-categorical development, so this “formal” approach to the category theory of quasi-categories immediately extends to other models of higher homotopical categories.