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Isaac Goldbring* (isaac@math.uic.edu), Department of Mathematics, Science and Engineering Offices M/C 249, 851 S. Morgan St., Chicago, IL 60622. *Elementary equivalence of II_1 factors.*

II_1 factors M and N are elementarily equivalent if they have the same first-order theory. By the Keisler-Shelah theorem, this can be given a logic-free formulation, namely M and N are elementarily equivalent if and only if they have isomorphic ultrapowers. Since this notion is coarser than isomorphism, it is not surprising that it has proven difficult to tell when two II_1 factors are elementarily equivalent or not. Currently, only three elementary equivalence classes of II_1 factors are known, although many expect there to be continuum many classes.

In this talk, I will survey what is known about elementary equivalence of II_1 factors. In particular, I will talk about recent work, joint with Thomas Sinclair, where we use Ehrenfeucht-Fraïssé games to show that two II_1 factors are elementarily equivalent if and only if their unitary groups are elementarily equivalent as \mathbb{Z}_4 metric spaces. If time permits, I will discuss elementary equivalence of subfactors.

No prior knowledge of logic will be assumed. (Received July 22, 2014)