Mathematics, Statistics, and Computer Science **@ UIC**

Logic Seminar

Interactions of Set Theory with $L_{\omega_1,\omega}$

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Abstract: I will discuss some aspects of continuing joint work with Friedman, Koerwein, Larson, Laskowski, and Shelah. This work uses forcing techniques to prove model theoretic results in ZFC. Force a model theoretic result to be consistent by a tool such as Martin's axiom, collapsing cardinals or a specific forcing with high model theoretic content. Then use iterated elementary embeddings of the model of set theory to show the model theoretic result is absolute between V and a well-chosen model. Deduce it holds in ZFC. Applications include various extensions of results for $L_{\omega_1,\omega}$ to analytically presented AEC, a new proof of Harrington's theorem on Scott rank of counterexamples to Vaught's conjecture and the development of a new notion of algebraic closure for $L_{\omega_1,\omega}$ that better explains $\aleph_1$-categoricity.

I will briefly contrast this with results about the characterization of cardinals. The circle is closed by concluding (95\% now) from arguments of the first sort that if a sentence of $L\omega_1,\omega$ characterizes a cardinal below the continuum then it has $2^{\aleph_1}$ models in $\aleph_1$.

Tuesday, November 25 at 4:00 PM in SEO 427