RESEARCH STATEMENT

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My research has been focusing on applications of set theory and logic to sofic groups, hyperlinear groups and C*-algebras. Using methods from model theory for metric structures, I proved that there are consistently power of the continuum many universal hyperlinear groups, and offered an alternative proof of the analogue fact for universal sofic groups, that had been proved by Simon Thomas with algebraic methods in 2010. For what concerns C*-algebras, I have been studying automorphism groups of C*-algebras from the point of view of descriptive set theory, obtaining so far non-classifiability results for automorphisms of strongly self absorbing C*-algebras up to conjugacy and unitary equivalence. In my future research, I will focus on automorphism groups of universal sofic and hyperlinear groups, aiming at independency results on their cardinality via the method of forcing. I will also continue my work on Borel complexity of conjugacy and unitary equivalence inside automorphism groups of C*-algebras, in the attempt to extend my previous non-classifiability results to the broader class of nuclear, simple, separable, unital C*-algebras.

References: M. Lupini, "Logic for metric structures and the number of universal sofic and hyperlinear groups", preprint, arXiv:1111.0729, submitted to "Proceedings of the American Mathematical Society".