Title: Triviality and nontriviality of homeomorphisms of Čech-Stone remainders

Abstract: If X is a locally compact metrizable space and ϕ is an homeomorphism of $\beta X \setminus X$, the Čech-Stone remainder $\beta X \setminus X$, we say that ϕ is trivial if it is induced by an homeomorphism between cocompact subsets of X. We are interested in understanding whether all homeomorphisms of $\beta X \setminus X$ can be trivial, and how this depends on set theory.

In case $X = \omega$, trivial homeomorphisms of $\beta X \setminus X$ correspond to almost permutations of ω, and whether or not $\mathrm{Homeo}(\beta X \setminus X)$ contains only trivial elements is independent of ZFC by the work of Rudin, Shelah, Steprans, and Velickovic. In particular CH entails the existence of nontrivial homeomorphisms of $\beta \omega \setminus \omega$, while the assumption of Forcing Axioms causes rigidity, and eliminates the possibility of nontrivial homeomorphisms.

In this talk we study similar phaenomena for more general topological spaces. We prove that the Continuum Hypothesis implies the existence of nontrivial homeomorphisms of $\beta \mathbb{R}^n \setminus \mathbb{R}^n$ for all n. This is the first result of this kind for connected spaces of dimension ≥ 2. Later, we sketch the various attempts and the partial results achieved towards proving that PFA implies that all homeomorphisms must be trivial, and we give connections with the theory of automorphisms of corona C^*-algebras.

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