

Speaker: William Chan

Title: Effective Bounds on Scott Ranks of Some Polish Metric Spaces

Abstract: Friedman, Koerwien, Nies, and Schlicht asked whether every Polish metric space (as a structure in the natural countable language of metric spaces) has countable Scott rank. They showed that the Scott rank of a compact Polish metric space is less than or equal to $\omega+1$ using some results of Gromov. Doucha showed the Scott rank of any Polish metric space is less than or equal to ω_1 .

In this talk, I will sketch a more direct proof that the Scott rank of a compact Polish metric space is $\omega+1$. Using infinitary logic in countable admissible fragments, I will also sketch a proof of the result of Doucha while establishing some additional effective bounds. For example, let M be a countable metric space and \underline{M} denote its completion. If \underline{M} is a proper Polish metric Polish space then $SR(\underline{M}) \leq \omega_1^M + 1$, which seems to be the analog of Nadel's bound for countable structures. If \underline{M} is a rigid Polish metric space, then $SR(\underline{M}) \leq \omega_1^M + 1$.