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Pseudofinite Structures and Pseudofinite Dimension

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Suppose that $\mathcal{C}$ is a class of finite structures in some first order language, and M is a non-principal ultraproduct of members of $\mathcal{C}$ (so M is a pseudofinite structure). I will describe a method introduced by Hrushovski and Wagner, and developed by Hrushovski, to assign a (pseudofinite) dimension to definable sets in M. In recent work with D. Garcia and C. Steinhorn, we found conditions on the pseudofinite dimension (so traceable ultimately to the finite structures) which guarantee that M is stable (or simple, or supersimple), and ensure that forking dependence is characterised by drop in dimension. I will also discuss a number of examples.

The first talk will be an elementary overview of pseudofinite dimension and its uses, and the second talk will discuss parts of the paper with Garcia and Steinhorn.