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**From pseudofinite fields to PAC substructures of stable
structures**

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The background for my thesis research is a 40-year interaction between field theory and model theory which began with work of James Ax on pseudofinite fields. In 1991 Hrushovski introduced the notion of a bounded PAC (bPAC) substructure of a model of a strongly minimal theory which generalized the notion of pseudofinite fields to strongly minimal models.

Influenced by Hrushovski's work on definability in pseudofinite fields and related structures, Kim and Pillay in the mid-1990's completed the foundational work on simple theories which Shelah had begun much earlier. The "bounded PAC substructures" of strongly minimal sets, studied by Hrushovski, could now be seen as supersimple structures of SU-rank 1. The basic aim of my research is to extend Hrushovski's theory from strongly minimal structures to arbitrary stable structures where possible and, as a consequence, to give a general method of building new simple theories.

This fits into a very basic theme of research over the past 10 years which creates new stable/simple structures from old ones, for example adding a generic predicate or a generic automorphism; beautiful pairs; and lovely pairs.