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Research statement

- **Research interests:** combinatorial and descriptive set theory and its connections with other fields of mathematics, specifically measure theory and topology.
- **Some earlier research:** the interplay between algebraic, combinatorial and topological properties of a given action of a group G of measurable transformations of a measurable space (X, \mathcal{A}) and the existence and properties of G -invariant measures defined on \mathcal{A} . In particular: the way in which invariance of a measure influences the size and the structure of the underlying σ -algebra, and the existence and properties of nonmeasurable sets.
- **Some current research:** special subsets of the reals, σ -ideals on Polish spaces. In particular: a recent joint work with Roman Pol presents an alternative (based on a classical descriptive set theory) proof of the Sabok-Zapletal dichotomy stating that if X is a Polish space and I is a σ -ideal on X generated by closed sets and such that the forcing P_I does not add Cohen reals, then for every Borel set $B \subseteq X$ not in I and every Borel function f from B into a Polish space with all fibers in I there is a G_δ -set $G \subseteq B$ not in I such that $f|_G$ is 1-1.
- **A list of my publications and preprints** can be found here: <http://www.mimuw.edu.pl/~piotrzak/publications.html>.