

Highlights from infinite games, mice, and their connection

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The study of inner models was initiated by Gödel's analysis of the constructible universe. Later, the study of canonical inner models with large cardinals, e.g., measurable cardinals, strong cardinals or Woodin cardinals, was pioneered by Jensen, Mitchell, Steel, and others. Around the same time, the study of infinite two-player games was driven forward by Martin's proof of analytic determinacy from a measurable cardinal, Borel determinacy from ZFC, and Martin and Steel's proof of levels of projective determinacy from Woodin cardinals with a measurable cardinal on top. First Woodin and later Neeman improved the result in the projective hierarchy by showing that in fact the existence of a countable iterable model, a mouse, with Woodin cardinals and a top measure suffices to prove determinacy in the projective hierarchy. This opened up the possibility for an optimal result stating the equivalence between local determinacy hypotheses and the existence of mice in the projective hierarchy. In this talk, we will outline the main concepts and results connecting determinacy hypotheses with the existence of mice with large cardinals as well as recent progress in the area.