

# The Category of Representations of $p$ -adic Groups and Hecke Algebras

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An explicit understanding of the category of all (smooth, complex) representations of  $p$ -adic groups provides an important tool in the construction of an explicit and a categorical local Langlands correspondence and also has applications to the study of automorphic forms. The category of representations of  $p$ -adic groups decomposes into subcategories, called Bernstein blocks. I will give an overview of what we know about the structure of the Bernstein blocks. In particular, I will discuss a joint project in progress with Jeffrey Adler, Manish Mishra and Kazuma Ohara in which we show that general Bernstein blocks are equivalent to much better understood depth-zero Bernstein blocks. This is achieved via an isomorphism of Hecke algebras and allows to reduce a lot of problems about the (category of) representations of  $p$ -adic groups to problems about representations of finite groups of Lie type, where answers are often already known or easier to achieve.

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