Abstract:
In the local Langlands program the (smooth) representation theory of p-adic reductive groups G in characteristic zero plays a key role. For any compact open subgroup K of G there is a so called Hecke algebra $H(G, K)$. The representation theory of G is equivalent to the module theories over all these algebras $H(G, K)$. Very important examples of such subgroups K are the Iwahori subgroup I and the pro-p Iwahori subgroup $I_p$. By a theorem of Bernstein the Hecke algebras of these subgroups (and many others) have finite global dimension.

In recent years the same representation theory of G but over an algebraically closed field of characteristic p has become more and more important. But little is known yet. Again one can define analogous Hecke algebras. Their relation to the representation theory of G is still very mysterious. Moreover they are no longer of finite global dimension. In joint work with R. Ollivier we prove that the characteristic p version of $H(G, I_p)$ is Gorenstein.