

# Banach–Hecke algebras and crystalline Galois representations

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## Abstract

I will discuss *joint work with Peter Schneider* on the  $p$ -adic completion of the Hecke algebra  $\mathcal{H}(G, \rho)$  of bi-equivariant compactly supported  $\text{End}(\rho)$ -valued functions on a totally disconnected, locally compact group  $G$  derived from a finite dimensional continuous representation  $\rho$  of a compact open subgroup  $U$  of  $G$ . (These are the “Banach–Hecke Algebras” of the title). After describing some general features of such algebras we study in particular the case where  $G$  is reductive and  $U$  is a maximal compact or Iwahori subgroup of  $G$ . In the maximal compact case, when  $\rho$  is a finite dimensional irreducible algebraic representation, we show that the completion of  $\mathcal{H}(G, \rho)$  is an affinoid algebra of functions on a disc; in the Iwahori case, we show similarly that the completion of the maximal commutative subalgebra is a certain explicit affinoid algebra. We relate the spectrum of this subalgebra to isomorphism classes of crystalline Dieudonné modules. This can be viewed as a coarse version of a hypothetical  $p$ -adic local Langlands correspondence (in the crystalline case.)