



# Coloquio IMAFI

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## Hecke algebras and representation theory of classical $p$ -adic groups

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### Abstract

We will explain the following, including the relevant definitions. Finite Weyl groups, which are Coxeter groups, appear as "skeletons" of classical groups (e.g. linear groups, symplectic groups, orthogonal groups) over any field. Over a finite field of cardinality  $q$ , this gives rise naturally to the associated Hecke algebra with parameter  $q$ . Over a  $p$ -adic field, an affine Weyl group appears through a refined construction, as well as the corresponding affine Hecke algebra. Quite remarkably, this leads to a correspondence between the representations of this Hecke algebra and an essential family of smooth representations of the classical  $p$ -adic group under study (actually through an equivalence of categories). Further developments result in a description of all families of smooth representations in terms of representations of suitable Hecke algebras.

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