Representations of a reductive $p$-adic group $G$ over a field $C$.

Abstract:

When $C$ is algebraically closed of characteristic different from $p$, for many groups $G$, a list of pairs $(J, \lambda)$, where $\lambda$ is a smooth $C$-representation of a compact modulo centre subgroup $J$ of $G$, has been produced such that any irreducible cuspidal $C$-representation of $G$ has the form $\text{ind}_J^G \lambda$, for a pair $(J, \lambda)$ unique up to conjugation. With Guy Henniart, we produced similar lists when $C$ is no longer assumed algebraically closed. Our other main result concerns supercuspidality. The notion of supercuspidality makes sense for the irreducible cuspidal $C$-representations of $G$, and also for the representations $\lambda$. In most cases we proved that $\text{ind}_G J \lambda$ is supercuspidal if and only if $\lambda$ is supercuspidal.