Whitehead Prize: citation for Jessica Fintzen

Short citation:

Professor Jessica Fintzen of the University of Cambridge, Duke University, and Universität Bonn is awarded a Whitehead Prize for her groundbreaking work in representation theory, in particular as it relates to number theory via the (local) Langlands program.

Long citation:

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Fintzen's main work has contributed to the understanding of the representations of a *p*-adic group, especially its supercuspidal representations. Among other things, Fintzen's work has led to the construction of previously unknown representations, sharpened our understanding of when tame constructions of types and representation are valid, and extended results into the modular representation setting.

In highly innovative work (some of it joint with Romano), Fintzen introduced tools that, for the first time, allowed us to say something concrete about positive-depth complex-valued supercuspidal representations of a general reductive group without any assumption on *p*, the characteristic of the residue field. Prior work assumed that *p* was larger than some constant determined by the combinatorial data associated to the group. The novel geometric techniques she introduced open up entirely new approaches to many of the central questions in *p*-adic representation theory. For example, Fintzen (and Fintzen–Romano in some settings) demonstrated how to construct examples of the minimal positive depth representations of Reeder and Yu without placing any restrictions on the underlying field.

In a substantial series of works, Fintzen replaced the vague "*p* is large" condition that one often invokes when studying harmonic analysis on *p*-adic groups with the very precise condition "*p* doesn't divide the order of the Weyl group, and the center is tame". For example, Fintzen shows that under these conditions, good elements, whose existence is critical for many results in harmonic analysis and representation theory on *p*-adic groups, always exist. Moreover, Fintzen's investigations have shown that this restriction on *p* is almost always sharp, and the techniques she has introduced raise the strong possibility that her work can be extended to all *p*, and, as has become clear from our experience with the general linear group, understanding what happens for all *p* is vitally important.

Building on the above work, in a tour de force of technical prowess, Fintzen found a way to correct known errors in the literature and show that, as long as *p* does not divide the order of the Weyl group and the center is tame, Yu's construction of supercuspidal representations is both valid and exhaustive. Moreover, Fintzen also establishes, at the same level of generality, that Yu's construction is both valid and exhaustive in the modular setting as well.