# THE FIELDS INSTITUTE
## FOR RESEARCH IN MATHEMATICAL SCIENCES

ABSTRACTS 1.2

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*A New Proof of the Mullineux Conjecture (25-30)*

In 1979, Mullineux gave an algorithmic description of the effect of tensoring an irreducible module of the symmetric group with the sign representation in positive characteristic. The conjecture was proven in 1996 by Kleshchev. In joint work with Brundan, we provide a new proof of the Mullineux conjecture which is entirely independent of Kleshchev's approach. Our approach utilizes the representation theory of the supergroup $GL(m|n)$ and the analogue of Schur-Weyl duality. Similar techniques also allow us to classify the irreducible polynomial representations of $GL(m|n)$ of degree $d$ for arbitrary $m, n$, and $d$, extending a recent result by Donkin.