

# Schur–Weyl duality for symmetric groups

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## Abstract

Schur–Weyl duality involves the commuting actions of the general linear group and the symmetric group on a tensor space, relating the irreducible representations of these two groups. The idea can be generalised to other groups using the partition algebra and its subalgebras. I will discuss one such generalisation, ‘Schur–Weyl–Jones duality’, as well as a refinement of this used to obtain a combinatorial formula for irreducible characters of the symmetric group.

Time permitting, I will discuss an application of this formula towards obtaining new bounds on the expected irreducible character of a  $w$ -random permutation, that is, a random permutation obtained via a word map  $w : S_n \times \dots \times S_n \rightarrow S_n$ .