



Department of Mathematics and Statistics

University of South Alabama

Colloquium

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Schur-Weyl Duality and the Free Lie Algebra

Schur-Weyl duality is a classical correspondence between subspaces of r -fold tensors of an n -dimensional vector space that are invariant under all linear operators and subspaces that are invariant under all permutations. This goes back to Schur's thesis in 1927. The space of r -fold tensors contains the space of homogeneous Lie polynomials of degree r . It turns out that Schur-Weyl duality induces a correspondence between subspaces of Lie polynomials that are invariant under all linear transformations and subspaces that are invariant under a certain subalgebra of the group algebra of the symmetric group of degree r . This subalgebra also arises in a surprisingly different context. Studying its structure leads to intriguing combinatorial questions (and a sequence that does not appear in the Online Encyclopedia of Integer Sequences!).

Thursday, October 13, 3:30 PM, in ILB 370

Refreshments served at 3 PM, in ILB 335