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*A multiset partition algebra and diagonal action on polynomials.*

The partition algebra  $P_r(n)$  arises as the commutant algebra of the symmetric group  $S_n$  when it acts on  $V^{\otimes r}$  where  $V = \text{span}\{v_1, v_2, \dots, v_n\}$  is the permutation module. In this talk we will introduce a multiset partition algebra as the commutant algebra of  $S_n$  when it acts on the space of polynomials of degree  $r$  in variables  $\{x_{ij} : 1 \leq i \leq n, 1 \leq j \leq k\}$  and where  $S_n$  acts on the first subscript of the variables. An RSK algorithm on multiset partitions helps us to describe how the space decomposes into irreducibles. (Received February 13, 2018)