MIKE ZABROCKI, York University

Another Schur-like basis in the algebra of Non-Commutative Symmetric Functions

The algebra of non-commuative symmetric functions (NSym) is the free algebra generated by one element of each degree and it is the dual Hopf algebra of the quasi-symmetric functions (QSym) (see for example: "Noncommutative symmetric functions" by I. Gelfand, et. al. and "Multipartite P-partitions and inner products of skew Schur functions" by I. Gessel).

Since this algebra was first studied, it was believed that 'the' analogue of the Schur symmetric functions in NSym must be the ribbon basis. Recent results however have called that into question since the dual to the Quasi-Schur functions by J. Haglund et. al. is 'Schur-like' and its commutative image in the ring of symmetric functions is a Schur function. In this talk I will present another candidate for a 'Schur-like' basis that is based on a determinantal formula and show that it has many interesting properties including a (right) Pieri and Littlewood-Richardson rule, a formula using creation operators, a projection onto the Schur symmetric functions, a Murnaghan-Nakayama rule, a generalization to Hall-Littlewood symmetric functions, etc. These 'Schur-like' bases make us rethink what might be possible in NSym and QSym. This is joint work with Chris Berg, Nantel Bergeron, Franco Saliola and Luis Serrano.