
CMS Krieger-Nelson Prize
Prix Krieger-Nelson SMC

STEPHANIE VAN WILLIGENBURG, University of British Columbia
An introduction to quasisymmetric Schur functions

In algebraic combinatorics a central area of study is Schur functions. These functions were introduced early in the last century with respect to representation theory, and since then have become important in other areas such as quantum physics and algebraic geometry.

These functions also form a basis for the algebra of symmetric functions, which in turn forms a subalgebra of the algebra of quasisymmetric functions that itself impacts areas from category theory to card shuffling. Despite this strong connection, the existence of a natural quasisymmetric refinement of Schur functions was considered unlikely for many years.

In this talk we will meet such a natural refinement of Schur functions, called quasisymmetric Schur functions. Furthermore, we will see how these quasisymmetric Schur functions refine many well-known Schur function properties, with combinatorics that strongly reflects the classical case including diagrams, walks in the plane, and pattern avoidance in permutations.

This talk will require no prior knowledge of any of the above terms.