

DALHOUSIE MATHEMATICS COLLOQUIUM

Thursday March 7 2019, 2:30 pm, Chase 319

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Schubert varieties and quiver representation varieties

Schubert varieties first arose in the study of classical enumerative geometry problems such as “how many lines intersect four given lines in 3-space (in general)?”. Today, they have importance in many areas of mathematics including algebraic geometry, representation theory, commutative algebra, and algebraic combinatorics.

A quiver is a finite directed graph and a representation of a quiver is an assignment of a vector space to each vertex and a linear map to each arrow. Quiver representation varieties parametrize representations of a fixed quiver. Like Schubert varieties, quivers and their representation varieties are ubiquitous in modern mathematics.

In this talk I will introduce some of this background material. Then I will discuss an ongoing program, joint with Ryan Kinser (University of Iowa), on unifying problems about properties of representation varieties of Dynkin quivers with the corresponding problems for Schubert varieties in multiple flag varieties. Our work concerns algebro-geometric, combinatorial, and K-theoretic properties, and it aims to unify and extend results obtained by mathematicians since at least the 1980s.