

Program

Time: Sun. 19:00 - 21:30.

Location: Online.

Prerequisites:

Basic algebra. Knowledge of algebraic geometry(also representation theory) is helpful, but we will review the necessary part.

Syllabus:

The purpose of this seminar is to understand the relation of combinatorial ideals to representation theory and (algebraic-)geometry. The main reference for the seminar is the book [1] by W.Fulton

Part I Combinatorial methods

1.Young tableaux.

2.The Robinson-Schensted-Knuth correspondence,

The Littlewood-Richardson rule, Symmetric functions.

Part II Application to representation theory

3.Representation of S_n .

4.Representation of GL_n .

Part III Application: The geometry of flag varieties

5.Review of algebraic geometry, Borel-Moore homology.

6.Grassmannians and flag varieties.

7.Schubert calculus and Schubert varieties.

Reference:

- [1] Young Tableaux by W.Fulton
- [2] Representation Theory: A First Course by W.Fulton, J.Harris
- [3] Lectures on the geometry of flag varieties by M. Brion