REPRESENTATIONS, SCHUR FUNCTORS, AND YOUNG TABLEAUX

Project Supervisor

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Project description

This project is in representation theory.

The goal in the first half of the project is for the student to learn the role of Young diagrams and Young tableaux in the finite-dimensional representation theory of the symmetric group and of $GL_n(\mathbf{C})$, including the relationship to Schur functors and the statement of Schur-Weyl duality. Young diagrams also arise in the study of certain infinite-dimensional representations of Lie groups, called cohomological representations. Using the ideas learned in the first part of the project, the student will work towards an classification of cohomological representations of unitary groups by Young diagrams, and a computation of the corresponding degrees of cohomology.

This is a good project for a student who likes algebra and combinatorics, and who enjoys working out a lot of explicit examples.