

Canonical Grothendieck Polynomials with Free Fermions (Zoom)

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A new classical method to construct the Schur functions is constructing matrix elements using half vertex operators associated with the classical boson-fermion correspondence. This construction is known as using free fermions. Schur functions are also known to be polynomial representatives of cohomology classes of Schubert varieties in the Grassmannian. By instead using K-theory, the representatives become the (symmetric) Grothendieck polynomials. A recent generalization was given by Hwang et al. called the (refined) canonical Grothendieck polynomials based on the work of Galashin–Grinberg–Liu and Yeliussizov. In this talk, we take the Jacobi–Trudi formulas of Hwang et al. as our definition and use Wick’s theorem to give a presentation for the canonical Grothendieck polynomials and their dual basis using free fermions. This generalizes the recent work of Iwao. Using this, we derive many known identities, as well as some new ones, through simple computations. This is based on joint work with Shinsuke Iwao and Kohei Motegi (arXiv: 2211.05002).

Orateur: Prof. SCRIMSHAW, Travis (Hokkaido University)