Lie Groups and Representation Theory Seminar at the University of Tokyo

リー群論・表現論セミナー

DATE   May 13 (Tue), 2014, 16:30–18:00

PLACE   Room 126, Graduate School of Mathematical Sciences

SPEAKER   **Ivan Cherednik** (The University of North Carolina at Chapel Hill, RIMS)

TITLE   Global q, t-hypergeometric and q-Whittaker functions

ABSTRACT   The lectures will be devoted to the new theory of global difference hypergeometric and Whittaker functions, one of the major applications of the double affine Hecke algebras and a breakthrough in the classical harmonic analysis. They integrate the Ruijsenaars–Macdonald difference QMBP and "Q-Toda" (any root systems), and are analytic everywhere ("global") with superb asymptotic behavior.

The definition of the global functions was suggested about 14 years ago; it is conceptually different from the definition Heine gave in 1846, which remained unchanged and unchallenged since then. Algebraically, the new functions are closer to Bessel functions than to the classical hypergeometric and Whittaker functions. The analytic theory of these functions was completed only recently (the speaker and Jasper Stokman).

The construction is based on DAHA. The global functions are defined as reproducing kernels of Fourier–DAHA transforms. Their specializations are Macdonald polynomials, which is a powerful generalization of the Shintani and Casselman–Shalika p-adic formulas. If time permits, the connection of the Harish-Chandra theory of global q-Whittaker functions will be discussed with the Givental–Lee formula (Gromov–Witten invariants of flag varieties) and its generalizations due to Braverman and Finkelberg (algebraic theory of affine flag varieties).