Lie Groups and Representation Theory Seminar
at the University of Tokyo

DATE   May 8 (Tue), 2007, 17:00–18:00

PLACE   Room 126, Graduate School of Mathematical Sciences

SPEAKER   **Tomoyuki Arakawa (   )** (Nara Women's University)

TITLE   Affine W-algebras and their representations

ABSTRACT   The W-algebras are an interesting class of vertex algebras, which can be understood as a generalization of Virasoro algebra. It was originally introduced by Zamolodchikov in his study of conformal field theory. Later Feigin–Frenkel discovered that the W-algebras can be defined via the method of quantum BRST reduction. A few years ago this method was generalized by Kac–Roan–Wakimoto in full generality, producing many interesting vertex algebras. Almost at the same time Premet re-discovered the finite-dimensional version of W-algebras (finite W-algebras), in connection with the modular representation theory.

In the talk we quickly recall the Feigin–Frenkel theory which connects the Whittaker models of the center of $U(g)$ and affine (principal) W-algebras, and discuss their representation theory. Next we recall the construction of Kac–Roan–Wakimoto and discuss the representation theory of affine W-algebras associated with general nilpotent orbits. In particular, I explain how the representation theory of finite W-algebras ($=$ the endomorphism ring of the generalized Gelfand–Graev representation) applies to the representation of affine W-algebras.

REMARK   14:40–16:40