Lie Groups and Representation Theory Seminar  
at the University of Tokyo

Date  March 24 (Tue), 2015, 18:00–19:30
Place  Room 126, Graduate School of Mathematical Sciences
Speaker  Piotr Pragacz (Institute of Mathematics, Polish Academy of Sciences)
Title  A Gysin formula for Hall–Littlewood polynomials

Abstract  Schubert calculus on Grassmannians is governed by Schur $S$-functions, the one on Lagrangian Grassmannians by Schur $Q$-functions. There were several attempts to give a unifying approach to both situations. We propose to use Hall–Littlewood symmetric polynomials. They appeared implicitly in Hall’s study of the combinatorial lattice structure of finite abelian $p$-groups and in Green’s calculations of the characters of $GL(n)$ over finite fields; they appeared explicitly in the work of Littlewood on some problems in representation theory. With the projection in a Grassmann bundle, there is associated its Gysin map, induced by pushing forward cycles (topologists call it ”integration along fibers”). We state and prove a Gysin formula for $HL$-polynomials in these bundles. We discuss its two specializations, giving better insights to previously known formulas for Schur $S$- and $P$-functions.