Macdonald polynomials and level two Demazure modules for affine $\mathfrak{sl}_{n+1}$

Rekha Biswal
Max Planck Institute

Abstract

An important result due to Sanderson and Ion says that characters of level one Demazure modules are specialized Macdonald polynomials. In this talk, I will introduce a new class of symmetric polynomials indexed by a pair of dominant weights of $\mathfrak{sl}_{n+1}$ which is expressed as a linear combination of specialized symmetric Macdonald polynomials with coefficients defined recursively. These polynomials arose in my own work while investigating the characters of higher level Demazure modules. Using representation theory, we will see that this new family of polynomials interpolates between characters of level one and level two Demazure modules for affine $\mathfrak{sl}_{n+1}$ and gives rise to new results in the representation theory of current algebras as a corollary. This is based on joint work with Vyjayanthi Chari, Peri Shereen and Jeffrey Wand.