

MIT Department of Mathematics Number Theory Seminar

PARTITION STATISTICS, QUASI-MOCK THETA FUNCTIONS, AND WEAK MAASS FORMS

KARL MAHLBURG
MIT

Abstract: Andrews recently defined two combinatorial objects (k -marked Durfee symbols and the smallest parts partition function) that are connected to weighted moments of Dyson's rank. He used these connections to derive generating functions and prove Ramanujan-type congruences for these objects.

The main results of this talk explain these objects from an automorphic forms perspective, building on recent work of Bringmann and Ono showing that Ramanujan's mock theta functions give examples of weak Maass forms (up to explicit error integrals). In particular, the generating functions for the k -marked Durfee symbols and smallest parts partition function are quasi-mock theta functions, which are derivatives of weak Maass forms that satisfy various differential equations. One key consequence is that the Durfee symbols and smallest parts function satisfy infinite families of congruences, similar to those that have recently been shown for the Andrews-Garvan crank and Dyson's rank.

THURSDAY, October 11

4:00 p.m.
Room 2-143