1077-05-1178 **Adriano M. Garsia*** (garsia@math.ucsd.edu). *Recent progress on the Shuffle Conjecture: Macdonald Polynomials and Parking Functions.*

The Frobenius characteristic $DH_n(X;q,t)$ of Diagonal Harmonics, under the diagonal action of S_n was shown by Mark Haiman in 2000 by Algebraic Geometry to be the image of the elementary symmetric function e_n by the operator ∇ that is an eigen-operator for the modified Macdonald basis $\tilde{H}_\mu[X;q,t]$ with eigenvalue $T_\mu = t^{n(\mu)}q^{n(\mu')}$. It was conjectured in 2002, by Haglund, et all that ,

$$DH_n(X;q,t) = \sum_{PF} t^{area(PF)} q^{dinv(PF)} Q_{ides(PF)}[X]$$

where the sum is over Parking Functions in the $n \times n$ lattice square, "*area*" and "*dinv*" are two elementary Parking Functions statistics and $Q_{ides(PF)}[X]$ is the fundamental Gessel quasi symmetric function indexed by the i-descent set of the diagonal permutation of the Parking unction PF. In this talk we cover some of the recent progress in the resolution of this conjecture. (Received September 17, 2011)