1060-33-71 **Siddhartha Sahi*** (sahi@math.rutgers.edu), Department of Mathematics, Rutgers University, Hill Center for the Mathematical Sciences, 110 Frelinghuysen Rd., Piscataway, NJ 08854-8019.
Eigenvalues of generalized Capelli operators and binomial coefficients.

Let $\mathbb{F}$ be a real division algebra of dimension d; thus $\mathbb{F} = \mathbb{R}, \mathbb{C}, \mathbb{H}$ and $d = 1, 2, 4$. The group $G = GL(n, \mathbb{F})$ acts naturally on the space V of $n \times n$ Hermitian $\mathbb{F}$-matrices. The associated representation of G on the polynomial algebra $P = P(V)$ is multiplicity-free with irreducible submodules P_λ indexed by partitions of length $\leq n$.

On the other hand, the space of G-invariant polynomial differential operators on V has a natural basis consisting of the *generalized* Capelli operators D_μ, which are also indexed by such partitions. By Schur's Lemma, D_μ acts on P_λ by a scalar, which we write as $c_{\lambda\mu}(d)$ to denote its dependence on the division algebra $\mathbb{F}$.

By an earlier result of the speaker, there is an element $\binom{\lambda}{\mu}_r$ in $\mathbb{Q}(r)$, called the generalized binomial coefficient, such that $c_{\lambda\mu}(d)$ is obtained from it by specializing $r = d$. We describe a new formula for these coefficients, which shows that they are quotients of two positive integral polynomials in r. (Received March 19, 2010)