

September 25, 2013: Hiroshi Oda (Takushoku University and MIT), *Differential-difference operators and radial part formulas for non-invariant elements*

Let $G = KAN$ be a real semisimple Lie group and consider the space $\mathcal{A}(G/K, \lambda)$ of simultaneous eigenfunctions for the invariant differential operators on G/K (λ is a spectral parameter). The Chevalley restriction $G/K \rightarrow A$ of the spherical function in $\mathcal{A}(G/K, \lambda)$ is a Heckman-Opdam hypergeometric function with a specific multiplicity parameter and it satisfies a system of differential-difference equations constructed by Cherednik operators. The solution space $\mathcal{A}(\mathbf{H}, \lambda)$ of this system is naturally a module of a certain graded Hecke algebra \mathbf{H} and it is known that the harmonic analysis for $\mathcal{A}(\mathbf{H}, \lambda)$ is very similar to the harmonic analysis for $\mathcal{A}(G/K, \lambda)$.

In this talk, by using Cherednik operators, we develop radial part formulas for Chevalley restriction which apply to certain types of non-invariant operators or functions. This formulas enable us to directly relate a submodule of $\mathcal{A}(\mathbf{H}, \lambda)$ to a submodule of $\mathcal{A}(G/K, \lambda)$.