Lie Group and Representation Theory Seminar

Date:	February 10 (Tue) , 2004, 17:00–18:00
Place:	RIMS 402
Speaker:	Soo Teck Lee (NUS, Singapore)
Title:	A basis for the k-fold tensor product algebra of $\mathrm{GL}_n(\mathbb{C})$

Abstract:

In this talk, I will disucss the recent work of Howe-Tan-Willenbring and Howe-Lee.

For each positive integer m, let U_m denote the maximal unipotent subgroup of $\mathrm{GL}_m(\mathbb{C})$ consisting of all upper triangular matrices with 1 on the diagonal. Let $l_1, ..., l_k \le n$ and $l = l_1 + \cdots + l_k$. Let the group $\mathrm{GL}_n(\mathbb{C}) \times \mathrm{GL}_{l_1}(\mathbb{C}) \times \cdots \times \mathrm{GL}_{l_k}(\mathbb{C})$ act on

$$\mathrm{M}_{nl}(\mathbb{C}) \cong \mathrm{M}_{n,l_1}(\mathbb{C}) \oplus \cdots \oplus \mathrm{M}_{n,l_k}(\mathbb{C})$$

by

$$(g, h_1, ..., h_k).(T_1, ..., T_k) = \left((g^{-1})^t T_1 h_1^{-1}, ..., (g^{-1})^t T_k h_k^{-1}\right)$$

where $g \in \mathrm{GL}_n(\mathbb{C})$, $h_i \in \mathrm{GL}_{l_i}(\mathbb{C})$ and $T_i \in \mathrm{M}_{n,l_i}(\mathbb{C})$ for $1 \le i \le k$. This action induces an action on the algebra $\mathcal{P}(\mathrm{M}_{nl})$ of polynomial functions on $\mathrm{M}_{nl}(\mathbb{C})$. The algebra

$$\mathcal{P}(\mathrm{M}_{nl})^{U_n \times U_{l_1} \times \cdots \times U_{l_k}}$$

of $U_n \times U_{l_1} \times \cdots \times U_{l_k}$ invariants contains information on the decomposition of k-fold tensor products of finite dimensional irreducible representations of $\mathrm{GL}_n(\mathbb{C})$. So it is called a *$k$-fold tensor product algebra of* $\mathrm{GL}_n(\mathbb{C})$. In this talk, we shall construct a basis for this algebra.

セミナー連絡先： 数理解析研究所 小林俊行