I. October 23, 2004, 11:00-12:00, RIMS, Room 206

Professor Eric Opdam
(Korteweg de Vries Institute for Mathematics, Amsterdam, The Netherlands)

TITLE:
Category O for rational Cherednik algebras and representations of Hecke algebras at roots of unity

ABSTRACT:
The category of representations $\text{Mod}_H$ of a finite dimensional Hecke algebra $H$ becomes very complicated when the parameters are specialized to certain bad roots of unity. In this talk we will first discuss the properties of a larger, more simple category $O$ of lowest weight modules over the rational Cherednik algebra. This category shares many structural similarities with the category of highest weight modules over a simple Lie algebra. Then we show, using Dunkl operators, that $\text{Mod}_H$ is actually a quotient of $O$ via a localization functor. It is remarkable that this construction works for all complex reflection groups whose braid group has a Coxeter-like presentation.


LUNCH: 12:10–13:30

II. October 23, 2004, 13:30-14:30, RIMS, Room 206

Dr. Sergey Oblezin (ITEF, Moscow, Russia)

TITLE:
On a class of representations of the Yangian and moduli space of monopoles

ABSTRACT:
A new class of infinite dimensional representations of the Yangians $Y(g)$ and $Y(b)$ corresponding to a complex semisimple algebra $g$ and its Borel subalgebra $b \subset g$ is constructed. It is based on the generalization of the Drinfeld realization of $Y(g)$, $g = \mathfrak{gl}(N)$ in terms of quantum minors to the case of an arbitrary semisimple Lie algebra $g$. The Poisson geometry associated with the constructed representations is described. In particular it is shown that the underlying symplectic leaves are isomorphic to the moduli spaces of $G$-monopoles defined as the components of the space of based maps of $\mathbb{P}^1$ into the generalized flag manifold $X = G/B$. Thus the constructed representations of the Yangian may be considered as a quantization of the moduli space of the monopoles.

(Joint with A. Gerasimov, S. Kharchev, D. Lebedev)