

Punita Batra

Research Summary:

I finished the problem of classification of irreducible, integrable representations of graded multi-loop Lie algebras. This is a joint work of mine with Tanusree Pal.

Let $\mathbb{C}_q = \mathbb{C}[t_1^{\pm 1}, t_2^{\pm 1} \dots t_n^{\pm 1}]$, where $t_i t_j = q_{ij} t_j t_i$ and q_{ij} are roots of unity, be the Quantum torus. Let $\text{Der}\mathbb{C}_q$ be the set of all derivations of \mathbb{C}_q . This is a Lie algebra. I am trying to find the irreducible modules of the Lie algebra $\mathbb{C}_q \rtimes \text{Der}\mathbb{C}_q$. I am trying to prove the results that any irreducible $\mathbb{C}_q \rtimes \text{Der}\mathbb{C}_q$ -module with finite dimensional weight spaces with respect to Cartan subalgebra has to be of the form $V \rtimes \mathbb{C}_q$, where V is a module for the Lie algebra gl_n .

Preprints:

1. Tanusree Pal, Punita Batra *Irreducible integrable representations of graded multi loop Lie Algebras*, <http://arxiv.org/abs/0706.0448v1>

Conference/Workshops Attended:

1. *Attended Chandigarh Symposium in Mathematics in memory of Prof. I. S. Luthar*, at Panjab University, Chandigarh, March 2- March 3, 2007.

Invited Lectures/Seminars:

1. *Gave an invited talk on "Integrable representations of twisted Toroidal Lie algebras"*, in the Chandigarh Symposium in Mathematics in memory of Prof. I. S. Luthar, Panjab University, Chandigarh, March 3, 2007.

Other Activities:

1. Guiding one HRI student towards her PhD.
2. Gave two lectures in the Rajbhasha scientific workshop at HRI in May 2006.