Manoj Kumar Yadav

Research Summary:

1. Let G be a finite p-group and N be a non-trivial proper normal subgroup of G. (G, N) is called a *Camina pair* if $xN \subseteq x^G$ for all $x \in G - N$, where x^G denotes the conjugacy class of x in G. It follows that (G, N) is a Camina pair if and only if $N \subseteq [x, G]$ for all $x \in G - N$, where $[x, G] = \{[x, g] | g \in G\}$. Let $Aut(G)$ denote the group of all automorphisms of G. In this research note we prove the following theorem:

Theorem. Let G be a finite p-group such that $(G, Z(G))$ is a Camina pair. Then $|G|$ divides $|Aut(G)|$.

This theorem extends the known classes of finite p-groups for which the following well known conjecture holds:

Conjecture. Let G be a non-cyclic p-group of order p^n, where $n \geq 3$. Then $|G|$ divides $|Aut(G)|$.

2. We give a sufficient condition on a finite p-group G of nilpotency class 2 so that $Aut_c(G) = Inn(G)$, where $Aut_c(G)$ and $Inn(G)$ denote the group of all class preserving automorphisms and inner automorphisms of G respectively. Next we prove that if G and H are two isoclinic finite groups (in the sense of P. Hall), then $Aut_c(G) \cong Aut_c(H)$. Finally we study class preserving automorphisms of groups of order p^5, p an odd prime and prove that $Aut_c(G) = Inn(G)$ for all the groups G of order p^5 except two isoclinism families.

Publications:

1. E. C. Dade and Manoj K. Yadav, *Finite groups with many product conjugacy classes,* Israel J. Math. **154**, 29-49, (2006)

Preprints:

1. Manoj K. Yadav, *On automorphisms of finite p-groups,* J. Group Theory, to appear

2. Manoj K. Yadav, *On automorphisms of some finite p-groups,* Proc. Indian Acad. Sci., Math. Sci., to appear

Conference/Workshops Attended:

1. *Victor Rothschild Memorial Symposia 10th Jerusalem Midrasha Mathematicae*, Israel, May, 2006.

2. *Classification of Reductive Algebraic Groups*, India, December, 2006.

3. *International Conference on Number Theory and Cryptography*, India, Feb., 2007.

Visits to other Institutes:

1. Indian Statistical Institute, Bangalore, India, Dec. 06, 2006 to Jan. 05, 2007.

Other Activities:

1. Gave seven lectures in VSSP at HRI on Group Theory, June, 2006.