

Lie Group and Representation Theory Seminar

Date: March 9 (Tue), 2004, 16:00–17:00

Place: RIMS 402

Speaker: Munibur R. Chowdhury

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Title: Arthur Cayley and his contribution to abstract group theory

Abstract:

We critically reexamine in considerable detail Cayley's first three papers on group theory (1854- 59), with special reference to his formulation of the (abstract) group concept. We show convincingly (we hope) that Cayley, writing his first paper on November 2, 1853, was in full and conscious possession of the abstract group concept, and that - as far as finite groups are concerned - his definition was complete and unequivocal, refuting opinion expressed by some earlier writers. Already in the first paper Cayley classified the abstract groups of orders upto 6, and suggested that there might exist composite numbers n such that the only abstract group of order n is the cyclic group of that order. We also discuss Cayley's motivation for generalizing the then current concept of a permutation group. Cayley extended the classification to groups of order 8 in the third paper. There he also initiated the study of groups in terms of generators and relations (a procedure usually attributed to Walter Dyck), and in this way constructed the abstract dihedral group of order $2n$. However, these pioneering studies were swept away by the then burgeoning surge of permutation groups, and apparently went completed unheeded by his contemporaries.

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