

Essays on geometric group theory

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Volume 9

Essays on geometric group theory

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Volume editor

N. S. Narasimha Sastry



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Essays on geometric group theory

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N. S. Narasimha Sastry

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Preface

Geometric ideas have played a very major role in the development of Group theory in 20th century. Coxeter groups and Coxeter complexes, Tits theory of buildings, Bass-Serre theory of Groups acting on trees, Gromov's notion of hyperbolic groups and combinatorial methods have all been very central in several areas of mathematics.

With the objective of introducing the basic ideas and recent developments in these topics to young researchers in various Research Institutions and Universities in India, the Indian Statistical Institute at its Bangalore Centre and the Indian Institute of Technology, Guwahati, organized "Instructional Workshop and International Conference on Geometric Group Theory" during December 2–21, 2002, at the beautiful campus of the Indian Institute of Technology, Guwahati.

In the Workshop part of this programme (December 2–14, 2002), five short courses of lectures were given. The topics were:

- Coxeter Groups (10 lectures) by R.P. Shukla and Maneesh Thakur
- Buildings and Tits Systems (10 lectures) by N.S. Narasimha Sastry
- Bass-Serre Theory (10 lectures) by A. Raghuram and B. Sury
- Hyperbolic Groups (5 lectures) by A. Naolekar
- Combinatorial Group Theory (5 lectures) by I.B.S. Passi and Roman Mikhailov

In the Conference part of this programme (December 16–21, 2002), experts in this area of mathematics were invited to give research/expository lectures in the topic of their expertise. The articles in this volume are mostly the expanded versions of the lectures delivered by the authors in this Conference. It is hoped that this volume will be of some assistance to mathematicians who would like to familiarize themselves with these topics.

The Organizing Committee for this programme consisted of Professors I.B.S. Passi (Chairman), N.S. Narasimha Sastry, B. Sury, B.K. Sarma and Meenaxi Bhattacharjee.

Apart from the Indian Statistical Institute and the Indian Institute of Technology, Guwahati, the programme also received financial support from the National Board for Higher Mathematics, India; The British Council, India; Harish-Chandra Research Institute, Allahabad; Oil and Natural Gas Commission and Oil India Limited.

I wish to thank all the speakers in this programme and the authors of the articles, without whose enthusiastic support, this programme would not have achieved its objective.

As a member of the organizing committee, I also thank all the sponsors for their financial support; the Indian Institute of Technology, Guwahati, for the excellent facilities and enthusiastic and cheerful support extended during the Conference; and the Ramanujan Mathematical Society for bringing out this volume.

I also would like to record my appreciation of the enthusiasm, meticulous attention to detail and the caring of Professor Meenaxi Bhattacharjee, her colleagues and students at IIT, Guwahati, which contributed largely towards making this event a very pleasant and fruitful experience. I am confident that all the participants at this event share this sentiment.

Finally, I would like to thank Ms. Asha Lata for her help in compiling this volume.

Date: 5 December 2008
Indian Statistical Institute
Bangalore Centre

N. S. Narasimha Sastry
Editor

Talks given in the Conference

Professor Peter Abramenko	Some applications of Bass-Serre theory to the GE_2 question
Professor Roger M. Bryant	Metanilpotent varieties of groups
Professor Marc Burger	Tree automorphisms, products of trees and lattices
Professor Alan Camina	Block designs
Dr. Indira Chatterji	Twisted idempotent conjectures
Dr. Ahmad Erfanian	On some groups with the zero presentation ranks
Mr. Shripad M. Garge	On conjugacy of Weyl groups
Professor Narain Datt Gupta	A group with the slowest sub-exponential growth
Professor C.K. Gupta	Recent results on automorphism groups
Professor Alessandra Iozzi	Trees and hyperbolic spaces
Dr. D.L. Johnson	Word growth of groups
Professor S.S. Khare	Group actions on smooth manifolds with specific fixed point sets
Dr. Linus Kramer	Symmetric spaces, asymptotic cones and buildings
Professor Ravi Kulkarni	Idea of a branched covering
Mr. Roman Mikhailov	On localization in groups and group varieties
Professor Shahar Mozes	Tree automorphisms, products of trees and lattices
Professor Himadri Mukherjee	On the isomorphism problem and related problems
Professor I.B.S. Passi	Centralizers and homology
Dr. Laszlo Pyber	Boundedly generated groups
Professor M.S. Raghunathan	The word metric on lattices in higher rank semi-simple Lie groups
Dr. A. Raghuram	Depths and conductors of representations of p -adic groups
Dr. Bertrand Remy	Non-linearities of Kac-Moody groups
Professor Mark Ronan	Constructing buildings and twin buildings

Dr. Parameswaran Sankaran	On automorphisms and quasi-isometries of finitely generated groups
Professor Marcus du Sautoy	Counting subgroups in nilpotent groups and points on elliptic curves
Professor Dan Segal	Subgroups of finite index in profinite groups
Professor J.B. Srivastava	Invariants of certain classical and reductive groups and their applications in computer vision
Dr. Geetha Venkataraman	Finite group enumerations: a brief introduction
Professor D.N. Verma	A natural representation model for the symmetric groups, and the ensuring potential for a new unified representation theory for Coxeter Groups
Dr. Christopher Voll	Zeta functions of groups and enumeration in Bruhat-Tits buildings of $Sl_n(Q_p)$
Professor John S. Wilson	Aspects of growth of groups

Conference Participants

Professor Peter Abramenko

Dr. Meenaxi Bhattacharjee

Professor Roger M. Bryant

Professor Marc Burger

Professor Alan Camina

Dr. Indira Chatterji

Professor B.P. Chetiya

Dr. Ahmad Erfanian

Professor C.K. Gupta

Professor Narain Datt Gupta

Professor Alessandra Iozzi

Dr. D.L. Johnson

Professor S.S. Khare

Dr. Linus Kramer

Professor Ravi Kulkarni

Professor Ramji Lal

Professor Shahar Mozes

Professor H.K. Mukherjee

Professor C. Musili

Dr. A. Naolekar

Professor I.B.S. Passi

Professor Dipendra Prasad

Dr. Laszlo Pyber

Dr. K.N. Raghavan

Professor M.S. Raghunathan

Dr. A. Raghuram

Dr. Bertrand Remy

Professor Mark Ronan

Dr. Paraeswaran Sankaran

Dr. Bhaba Kumar Sarma

Professor N.S.N. Sastry

Professor Marcus du Sautoy

Professor Dan Segal

Professor B.L. Sharma

Dr. Ravindra Prasad Shukla

Professor J.B. Srivastava

Dr. B. Sury

Dr. Maneesh Thakur

Professor D.N. Verma

Professor Christopher Voll

Professor John S. Wilson

Workshop Participants

Md. S K Safique Ahmad

Ms. Sasmita Barik

Mr. Dhruva Jyoti Bora

Ms. Ardeline Mary Buhphang

Mr. Anandaram Burhagohain

Mr. Moon Kumar Chetry

Ms. Jonali Choudhury

Mr. Biren Das

Dr. Partha Pratim Dey

Dr. Sanjay Kumar Dutta

Dr. Sanghita Dutta

Mr. Shripad M Garge

Mr. Sahzamal Hoque

Mr. Rafiqul Islam

Mr. Rupesh Kumar Jha

Mr. Bidyut Kalita

Mr. Roman Mikhailov

Mr. Milan Nath

Mr. Tulasi P Nepal

Mr. Binod Kumar Sahoo

Mr. Siddhartha Sarka

Mr. Ritumoni Sarma

Mr. Brajesh Kumar Sharma

Mr. Angom Tiken Singh

Mr. Anupam Kumar Singh

Mr. Ningthoujam Jiban Singh

Mr. Thokchom Vikramjit

Ms. Hiramala Talukdar

Ms. Madhusmita Tripathy

Dr. Geetha Venkataraman

Dr. Christopher Voll

Mr. Akhilesh Chandra Yadav

Mr. Satya Narayan Yadav

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