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# Geometric and Cohomological Methods in Group Theory

Edited by

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## Preface

More than eighty mathematicians from a variety of countries gathered in Durham in July 2003 for the London Mathematical Society's symposium on Geometry and Cohomology in Group Theory. This was the third symposium in an influential sequence of meetings that began with the meeting organised by Scott and Wall in 1976 and continued with the Kropholler–Stöhr meeting in 1994. As with these previous meetings, the 2003 Symposium attracted many of the world's leading researchers in this highly active field of mathematics.

The meeting came at an exciting time in the field, marked by a deepening of the fertile interactions with logic, analysis and large-scale geometry, as well as striking progress on classical problems at the heart of cohomological group theory. The symposium was built around six lecture courses exposing important aspects of these recent developments. The lecturers were A. Adem, W. Lück, J. McCammond, L. Mosher, R. Oliver, and Z. Sela.

The structure of this volume reflects that of the symposium: major survey articles form the backbone of the book, providing an extended tour through a selection of the most important trends in modern geometric group theory; these are supported by shorter research articles on diverse topics. All of the articles were refereed and we thank the referees for their hard work.

The articles corresponding to the minicourses are written in a style that researchers approaching the field for the first time should find inviting. In the first, Bestvina and Feighn present their own interpretation of Sela's theory of limit groups. (Important aspects of the theory are developed in the many exercises and an appendix by Wilton guides the reader through these.) Lück's essay on  $L^2$ -methods in geometry, topology and group theory is crafted specifically for an algebraically-minded audience. Mosher's article on the quasi-isometric rigidity of certain mapping class groups begins with a general introduction to quasi-isometric rigidity. McCammond's account of non-positive curvature in group theory focuses on the explicit construction of examples, emphasising the utility of combinatorics and computational group theory in this regard.

We thank all of the authors who contributed to this volume and apologise to them for our tardiness in gathering their work into final form. We thank the London Mathematical Society and the Engineering and Physical Sciences Research Council of the United Kingdom for their continuing support of the Durham Symposia series. We recall with particular fondness the contribution

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that the late Karl Gruenberg made to this symposium and its predecessors. We thank him and all of the participants of the 2003 symposium, each of whom made a contribution to its congenial atmosphere and mathematical success. We hope that some of the mathematical excitement generated at the meeting will be transmitted to the reader through these proceedings.

Martin R. Bridson, University of Oxford  
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