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Kleinian Groups and Hyperbolic 3-Manifolds

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Preface

This volume forms the proceedings of the workshop *Kleinian Groups and Hyperbolic 3-Manifolds* which was held at the Mathematics Institute, University of Warwick, 11–15 September 2001. Almost 80 people took part, many travelling large distances to come.

The workshop was organised around six expository lectures by Yair Minsky on the combinatorial part of his programme to extend his results on Thurston's ending lamination conjecture for once punctured tori to general surfaces. Not long after the workshop, a complete proof of the conjecture was announced by Brock, Canary and Minsky. This is undoubtedly one of the most important developments in the subject in the last decade, paving the way for a complete understanding of the internal geometry of hyperbolic 3-manifolds, and involving deep understanding of the fascinating links between this geometry and the combinatorics of the curve complex. Minsky's lectures, reproduced in this volume, give an invaluable overview.

As was clear from the talks at the conference, hyperbolic geometry is currently developing with astonishing rapidity. We hope that the expositions here will provide a useful guide. The volume is divided into three parts. Part I contains Minsky's lectures together with other articles on the geometry of hyperbolic 3-manifolds. The paper by Hodgson and Kerckhoff is an exposition of their recent work on cone manifolds. This is key to many recent developments, in particular Brock and Bromberg's proof, outlined here, of the long standing Bers' density conjecture for incompressible ends. Otal's result on unknottedness is an important ingredient. Other exciting developments concern the extension of known results from incompressible to compressible boundaries, based on a recent breakthrough by Kleineidam and Souto who here explain and develop some of their advances.

Part II revolves around several articles which revisit Troels Jørgensen's famous but hitherto unpublished paper *On pairs of once-punctured tori*. We are delighted to have Jørgensen's permission to include his paper here. Part III contains three expository papers on closely related topics, notably Epstein, Marden and Markovic's counterexample to Thurston's $K = 2$ conjecture.

We would like to thank the London Mathematical Society for funding the conference. The organisers were the first and last editors, Makoto Sakuma and Young Eun Choi. The editors owe a considerable debt to David Sanders whose \TeX expertise rapidly got the articles for this volume into their present coherent shape. We would also like to thank Nicholas Wickens for assisting with the editorial work and Yasushi Yamashita for putting Jørgensen's article into \TeX .

Finally, it will not have escaped notice that our conference began on September 11, 2001. Inevitably the terrible events of that day overshadowed the conference and occupied the thoughts of all the participants. We were very thankful that everyone arrived safely and the conference was able to proceed as planned.

Yohei Komori, Vladimir Markovic and Caroline Series
Mathematics Institute, University of Warwick, February 2003