

Preface

This text is based upon a recent course at Bar Ilan University, as well as upon numerous collaborative efforts (see the Acknowledgments Chapter following this Preface). After dealing with classical geometric preliminaries, including the *theorema egregium* of Gauss, we present new geometric inequalities of systolic type on Riemann surfaces, as well as their higher dimensional generalisations. Thus, the text can be viewed as an expanded version of a part of the survey by C. Croke and the present author [CrK03], which itself dealt with a small part of the material in M. Gromov's seminal text *Filling Riemannian manifolds* [Gro83]. Most of the results presented here have been obtained over the past four years, a reflection of the rapid progress in the field since the publication of the monograph [Gro99] seven years ago. M. Berger's recent monograph [Berg03] provides a fascinating historical perspective unburdened by proofs, *cf.* Section 2.1.