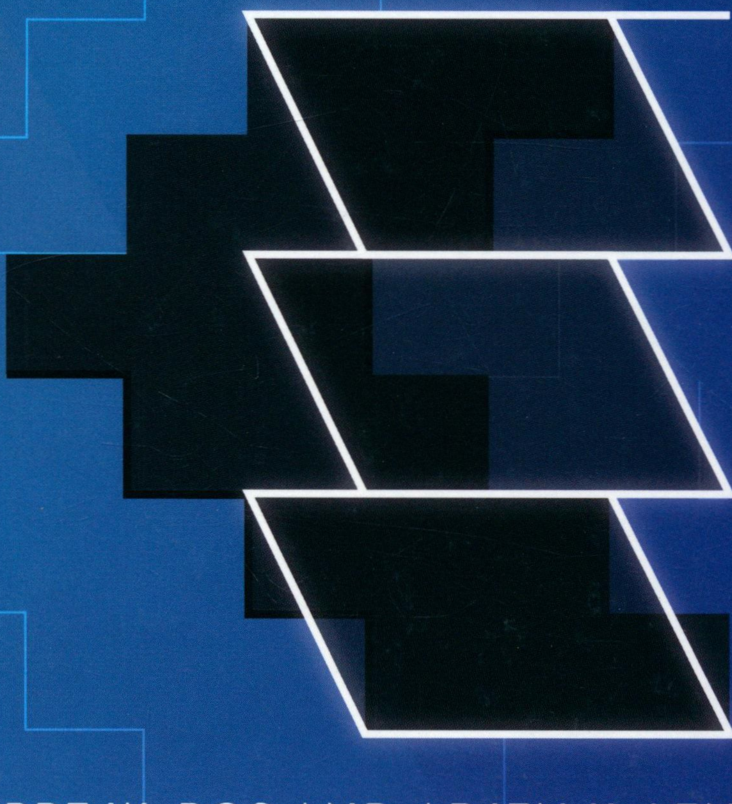
TOPICS IN COMPUTATIONAL NUMBER THEORY

INSPIRED BY PETER L. MONTGOMERY



JOPPE W. BOS AND ARJEN K. LENSTRA

Peter L. Montgomery has made significant contributions to computational number theory, introducing many basic tools such as Montgomery multiplication, Montgomery simultaneous inversion, Montgomery curves, and the Montgomery ladder. This book features state-of-the-art research in computational number theory related to Montgomery's work and its impact on computational efficiency and cryptography. It covers a wide range of topics such as Montgomery multiplication for both hardware and software implementations; Montgomery curves and twisted Edwards curves as proposed in the latest standards for elliptic curve cryptography; and cryptographic pairings. This book provides a comprehensive overview of integer factorization techniques, including dedicated chapters on polynomial selection, the block Lanczos method, and the FFT extension for algebraic-group factorization algorithms. Graduate students and researchers in applied number theory and cryptography will benefit from this survey of Montgomery's work.

Joppe W. Bos is a cryptographic researcher at the Innovation Center for Cryptography & Security at NXP Semiconductors. He also currently serves as the Secretary of the International Association for Cryptologic Research (IACR). His research focuses on computational number theory and high-performance arithmetic as used in public-key cryptography.

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Preface

This book was written in honor of Peter L. Montgomery and his inspirational contributions to computational number theory. The editors would like to extend their sincerest thanks to all authors for their enthusiastic response to our invitation to contribute, and to Nicole Verna for the cover design.

Contents