

# Table of Contents for COLL/64

## Harmonic Maass Forms and Mock Modular Forms: Theory and Applications

- Background
  - ◆ Elliptic functions
  - ◆ Theta functions and holomorphic Jacobi forms
  - ◆ Classical Maass forms
- Harmonic Maass forms and mock modular forms
  - ◆ The basics
  - ◆ Differential operators and mock modular forms
  - ◆ Examples of harmonic Maass forms
  - ◆ Hecke theory
  - ◆ Zwegers' thesis
  - ◆ Ramanujan's mock theta functions
  - ◆ Holomorphic projection
  - ◆ Meromorphic Jacobi forms
  - ◆ Mock modular Eichler-shimura theory
  - ◆ Related automorphic forms
- Applications
  - ◆ Partitions and unimodal sequences
  - ◆ Asymptotics for coefficients of modular-type functions
  - ◆ Harmonic Maass forms as arithmetic and geometric generating functions
  - ◆ Shifted convolution  $L$ -functions
  - ◆ Generalized Borcherds products
  - ◆ Elliptic curves over  $\mathbb{Q}$
  - ◆ Representation theory and mock modular forms
  - ◆ Quantum modular forms
  - ◆ Representations of mock theta functions
  - ◆ Bibliography
  - ◆ Index