solving ordinary differential equations. However, it conceals a lot of mathematical depth, and innocent readers are given no clue about the further effort required, not even in the preface or in a concluding section. With this reservation, I would recommend the book to students starting research in applied analysis as an excellent source of the basic ideas about applications of semigroups.

C. J. K. BATTY

RAMAKRISHNAN, D. and VALENZA, R. J. *Fourier analysis on number fields* (Graduate Texts in Mathematics, vol. 186, Springer, 1999), xxi + 350 pp., 0 387 98436 4, £30.50.

This book is addressed to students with a basic US graduate-level knowledge of algebra, analysis and topology, possibly intending to do research in modern number theory, harmonic analysis or the representation theory of Lie groups. It is divided into seven chapters, covering (1) Topological groups, (2) (classical) Representation theory, (3) Pontryagin duality for locally-compact abelian groups, (4) Structure of 'arithmetic fields', (5) Adeles, ideles and class-groups, (6) Quick tour of class field theory, (7) Tate's thesis and applications. Each chapter is supplemented by a set of instructive exercises, some broken into convenient 'bite-sized' sub-exercises. Those for Chapter 7 are particularly copious.

The material of Chapters 1–3, together with related appendices at the end of the book, is very carefully written, in a reader-friendly format, and constitutes a valuable introduction to the basic functional-analytic aspects of the theory. Chapters 4 and 5 apply the foregoing theory to derive the structure of 'arithmetic fields' (i.e. local or global fields) and of the related adele-rings, idele-groups and idele-class-groups; again, these are carefully written and enjoyable to read.

On the other hand, as a practising number-theorist, I am less satisfied by some aspects of Chapters 6 and 7. Although the exercises here are quite good, I am not convinced that a budding Ph.D. student in contemporary number theory would gain from this book enough of the important insights into the subject that he/she would need for work on some of the research topics alluded to in the Preface. The treatments of L-functions attached to Galois representations, and of p-adic L-functions, are rather scanty. For instance, a short account of the highlights of appropriate parts of p-adic analysis, placed, say, at the end of Chapter 5, might have served to whet the appetite for research into a topic of great current interest, but this opportunity has been missed. A similar criticism applies to the treatment of Galois representations and the associated L-functions.

Overall, it seems to the reviewer that this book is rather lop-sided, the first few chapters being admirably suited to the needs of the intended readership, but the last two failing to achieve the same high standard.

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