

PREFACE TO THE CORRECTED REPRINT

Over the past twenty years or so, multigrid methods have come into widespread use in computational science and engineering. The present book has found its way to many readers as an introduction to the basic multigrid principles, aimed at scientists and engineers. It went out of print in 1999. It seems to have been well liked, so I am pleased that it is now available again in a hard cover edition. Since 1991, when the book was completed, there have been further developments in multigrid methods, notably in the area of algebraic and parallel multigrid, and in applications other than partial differential equations, where multilevel methods is a more suitable designation. However, taking new developments into account would have required a major effort in rewriting, which I decided against. Since the basic multigrid principles have not changed, this corrected reprint remains adequate as a first introduction to the subject.

Reference to this book is to be made as follows: Pieter Wesseling, *An Introduction to Multigrid Methods*. John Wiley & Sons Ltd., 1992. Corrected Reprint. Philadelphia: R.T. Edwards, Inc., 2004.

For those seeking further information on multigrid methods, a very useful gateway is the MGNet website, to be found at www.mgnet.org. Craig C. Douglas renders a valuable service to the community by maintaining this website. Here books, articles, preprints, software, websites of researchers, information on meetings, relevant links, and other useful information can be found.

To illustrate the principles outlined in the book and as a teaching aid, I have written a Fortran-77 code called `mglab.for`. This code is a tutorial multigrid program that solves elliptic boundary value problems in one dimension, using the methods described in the book. The user can experiment with various multigrid cycles, transfer operators, smoothing methods and nested iteration. It can be downloaded freely from the MGNet website. The one-dimensional setting is suitable for tutorial purposes, but of course, multigrid comes into its own in challenging applications in higher dimensions. Much relevant software is to be found at MGNet.

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Delft, February 2004