

Preface

In this book I aim to describe most of what a scientist needs to know about mathematical writing. Although the focus is on *mathematical* writing, most of the book is applicable to scientific writing in general.

The target audience is undergraduate students, graduate students, and practicing scientists. Students often have little experience or knowledge of technical writing and can be daunted by the task of writing a report or thesis. The advice given here reflects what I have learned in the more than three decades since I wrote my first project report as an undergraduate student and describes what I now wish I had known as I started to write that first report.

The book functions as a comprehensive handbook that can be both read sequentially and used as a reference when questions about mathematical writing arise. Indeed I will use it for reference myself—to remind myself of rules for formatting equations and English usage, to look up a \LaTeX symbol, or to be inspired by the quotations that appear at the start of each chapter.

The content can broadly be summarized as follows.

- Aspects of writing specific to mathematics.
- Key elements of English usage.
- How to revise your writing.
- How to write when English is not your first language.
- How to write and publish a paper.
- How to write and deliver a talk or poster.
- How to write and defend a thesis.
- How to write and index a book.
- How to write a blog post.
- How to review a paper, book proposal, or book.
- How to exploit \TeX and \LaTeX .
- Workflow: how to organize and automate the many tasks involved in writing.

An important feature of the book is that many examples are given to illustrate the ideas and principles discussed. In particular, Chapter 7 (“Revising a Draft”) contains a collection of extracts from the mathematics and

computer science literature, with detailed comments on how each extract can be improved.

The subject of mathematical writing can easily become boring, so to liven it up I include anecdotes, unusual paper titles, humorous quotations, and so on.

A web page for the book can be found at <https://bookstore.siam.org/ot167/bonus>. It includes

- Updates relating to material in the book.
- Links to other web pages related to mathematical writing, \LaTeX , \BibTeX , etc.
- Links to web pages giving examples of posters.
- The bibliography for the book in \BibTeX form and a typeset version of the bibliography in PDF form. The bibliography includes DOIs and URLs, so an easy way to consult a reference is by clicking on the links in the PDF file.

What's New in the Third Edition

The first edition of this book was published in 1993 and the second edition in 1998. In the last twenty years I have learned a lot more about writing, and the internet has become more deeply integrated in writing and publishing. In addition, the publishing landscape is undergoing significant changes with the advent of open access publishing. For this third edition I have, accordingly, given the book a major overhaul. I have added new material, removed material that is no longer relevant, reorganized much of the content, and made the book easier to use for reference. Some of the main changes are as follows.

- The chapter “ \TeX and \LaTeX ” has been greatly expanded and contains many more tricks and tips as well as discussion of many \LaTeX packages.
- A new chapter “Refereeing and Reviewing” has been added.
- A new chapter “Writing a Book” includes advice on choosing a publisher and \LaTeX tips particular to books.
- A new chapter “Writing a Blog Post” has been added.
- A new chapter “Workflow” covers text editors, markup languages, version control, and much more.
- A new chapter “Preparing an Index” discusses the principles of indexing and how to prepare an index in \LaTeX , greatly expanding on a previous four-page section on indexing.
- The previous “asides”—brief diversions on topics related to the text—are now in gray boxes and more have been added, including several on “Publication Peculiarities.”

- The material on the publishing process now treats open access publishing, DOIs, and ORCID.
- The poster chapter has more on poster design and now discusses e-posters and the poster blitz.
- Many new references have been added, and all book references have been updated to the latest editions. DOIs have been collected and are included in the online version of the bibliography.
- The L^AT_EX `backref` package is now used, linking bibliography items to the pages on which they are cited, so the author index has been removed.

Some of the new material has been adapted from my blog at <https://nhigham.com/>. I will continue to publish posts about mathematical writing there.

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