

---

## Preface

This book is the third volume of a treatise on minimal surfaces consisting of altogether three volumes which can be read and studied independently of each other. The central theme is *boundary value problems for minimal surfaces*, such as Plateau's problem. The present treatise forms a greatly extended version of the monograph *Minimal Surfaces I, II* by U. Dierkes, S. Hildebrandt, A. Küster, and O. Wohlrab, published in 1992, which is often cited in the literature as [DHKW]. New coauthors are Friedrich Sauvigny for the first volume and Anthony J. Tromba for the second and third volume.

The title of this third volume might be somewhat misleading since many aspects of minimal surface theory treated in the preceding two volumes are also of a global nature. Moreover, the lecture notes collected in [GTMS] deal with problems that are essentially different from those investigated here. Nevertheless we think that the title is justified, because at least Part II of the present book is in an essential way based on notions, methods, and results of general *Global Analysis*. Furthermore, also Part I sheds light on certain global aspects of minimal surfaces.

We are very grateful to Ruben Jakob who read the entire typescript and pointed out numerous errors and misprints. His assistance was invaluable, and we are greatly indebted to his enthusiasm and tireless energy. We also thank Klaus Bach, Frei Otto, and Eric Pitts for providing us with photographs of various soap film experiments. Many thanks also to Friedrich Tomi for his comments on the index theorems.

The continued support of our work by the Sonderforschungsbereich 611 at Bonn University as well as by the Hausdorff Institute for Mathematics in Bonn and its director Matthias Kreck was invaluable. We also thank the Centro di Ricerca Matematica Ennio De Giorgi in Pisa and its director Mariano Giaquinta for generous support of our work. We are especially grateful to Anke Thiedemann and Birgit Dunkel who professionally and with untiring patience typed many versions of the new text. Last but not least we should

like to thank our publisher and in particular our very patient editors, Catriona Byrne, Marina Reizakis, and Angela Schulze-Thomin, for their encouragement and support.

*Duisburg*

*Bonn*

*Santa Cruz*

*Ulrich Dierkes*

*Stefan Hildebrandt*

*Anthony J. Tromba*