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J. Warnatz · U. Maas · R.W. Dibble

Combustion

Physical and Chemical Fundamentals,
Modelling and Simulation,
Experiments, Pollutant Formation

With 158 Figures



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Professor Dr. Jürgen Warnatz
Universität Heidelberg
Interdisziplinäres Zentrum
für Wissenschaftliches Rechnen
Im Neuenheimer Feld 368
D - 69120 Heidelberg

Priv.-Doz. Dr. Ulrich Maas
Konrad-Zuse-Zentrum
für Informationstechnik
Heilbronner Straße 10
D - 10711 Berlin

Professor Dr. Robert W. Dibble
University of California
Dept. of Mechanical Engineering
Etcheverry Hall
Berkeley, CA 94720
USA

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Preface

This book has evolved from a lecture series on combustion at Stuttgart University. The lectures were intended to provide first-year graduate students (and advanced undergraduates) with a basic background in combustion. Such a course was needed since students of combustion arrive with a wide variety of backgrounds, including physics, physical chemistry, mechanical engineering, computer science and mathematics, aerodynamics, and atmospheric science. After a few years of improving printed matter distributed to the students, the lecture notes have been organized into a book, first in German, and now translated and augmented in this English edition.

We intend that the book provides a common basis from which research begins. Thus, the treatment of the many topics is compact with much citation to the research literature. Beyond this, the book expects that combustion engineers and researchers will increasingly rely on mathematical modeling and numerical simulation for guidance toward greater understanding, in general, and, specifically, toward producing combustion devices with ever higher efficiencies and with lower pollutant emissions.

Because this book is a research launching point, we expect it to be updated in a timely fashion. We invite the readers to browse at our internet address at U. C. Berkeley (<http://www.me.berkeley.edu/cal/book>) for additional comments that may be part of the next edition. More importantly, we encourage readers to send constructive critical comments.

Like the students mentioned above, the authors themselves come from diverse backgrounds and owe much thanks to too many people to cite. However, we do have one place in common: We express thanks to our colleagues at the Combustion Research Facility at Sandia National Laboratories in Livermore, California; the CRF has been for us a fertile crossroads.

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