

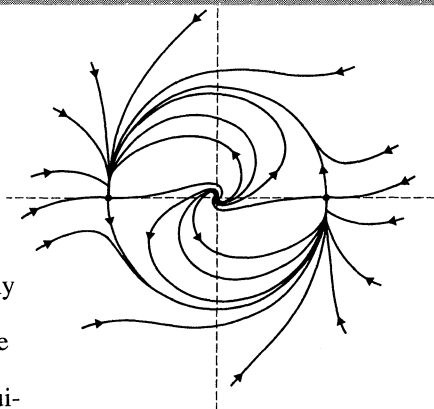
F. Verhulst, University of Utrecht

Nonlinear Differential Equations and Dynamical Systems

1990. IX, 277 pp. 107 figs. 2 tabs.
(Universitext) Softcover DM 38,-
ISBN 3-540-50628-4

On the subject of differential equations a great many elementary books have been written. This book bridges the gap between elementary courses and the research literature. The basic concepts necessary to study differential equations - critical points and equilibrium, periodic solutions, invariant sets and invariant manifolds - are discussed. Stability theory is developed starting with linearisation methods going back to Lyapunov and Poincaré. The global direct method is then discussed. To obtain more quantitative information the Poincaré-Lindstedt method is introduced to approximate periodic solutions while at the same time proving existence by the implicit function theorem. The method of averaging is introduced as a general approximation-normalisation method. The last four chapters introduce the reader to relaxation oscillations, bifurcation theory, centre manifolds, chaos in mappings and differential equations, Hamiltonian systems (recurrence, invariant tori, periodic solutions.).

The book presents the subject material from both the qualitative and the quantitative point of view. There are many examples to illustrate the theory and the reader should be able to start doing research after studying this book.



S. Wiggins, California Institute of Technology, Pasadena, CA

Introduction to Applied Nonlinear Dynamical Systems and Chaos

1990. Approx. 705 pp. 291 figs. (Texts in Applied Mathematics, Vol. 2)
Hardcover DM 98,- ISBN 3-540-97003-7

This significant, forthcoming volume is intended for advanced undergraduate or first year graduate students as an introduction to applied nonlinear dynamics and chaos. The author has placed emphasis on teaching the techniques and ideas which will enable students to take specific dynamical systems and obtain some quantitative information about the behavior of these systems. He has included the basic core material that is necessary for higher levels of study and research. Thus, people who do not necessarily have an extensive mathematical background, such as students in engineering, physics, chemistry and biology, will find this text as useful as students of mathematics.

Overall, this will be a text that should be required for all students entering this field.

Springer-Verlag Berlin Heidelberg New York London Paris Tokyo Hong Kong

Heidelberger Platz 3, D-1000 Berlin 33 · 175 Fifth Ave., New York, NY 10010, USA · 8 Alexandra Rd., London SW19 7JZ, England ·
26, rue des Carmes, F-75005 Paris · 37-3, Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan · Room 1603, Citicorp Centre,
18 Whitfield Road, Causeway Bay, Hong Kong

H&S 9485E/1

Springer



Communications in **Mathematical Physics**

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board M. Aizenman, New York, NY
 H. Araki, Kyoto
 A. Connes, Bures-sur-Yvette
 J.-P. Eckmann, Genève
 M. E. Fisher, College Park, MD
 J. Fröhlich, Zürich
 K. Gawedzki, Bures-sur-Yvette
 J. L. Lebowitz, New Brunswick, NJ
 J. Mather, Princeton, NJ
 N. Yu. Reshetikhin, Cambridge, MA
 B. Simon, Pasadena, CA
 Ya. G. Sinai, Moscow
 T. Spencer, Princeton, NJ
 S.-T. Yau, Cambridge, MA

Advisory Board M. F. Atiyah, Oxford
 F. Hirzebruch, Bonn
 G. 't Hooft, Utrecht
 R. Schrieffer, Santa Barbara, CA
 I. Singer, Cambridge, MA
 C. N. Yang, Stony Brook, NY

Responsible for Advertisements

Springer-Verlag
Printers
Printed in Germany

E. Lückermann, M. Stresow, Heidelberger Platz 3, D-1000 Berlin 33
Telephone: (030) 8207-1, Telex 01-85411, FAX (0)30/820 7300
Berlin Heidelberg New York Tokyo Hong Kong Barcelona
Brühlsche Universitätsdruckerei, Giessen
© Springer-Verlag Berlin Heidelberg 1990
Springer-Verlag GmbH & Co KG, D-1000 Berlin 33