# Applied Mathematical Sciences



## EDITORIAL STATEMENT

The mathematization of all sciences, the fading of traditional scientific boundaries, the impact of computer technology, the growing importance of mathematical-computer modelling and the necessity of scientific planning all create the need both in education and research for books that are introductory to and abreast of these developments.

The purpose of this series is to provide such books, suitable for the user of mathematics, the mathematician interested in applications, and the student scientist. In particular, this series will provide an outlet for material less formally presented and more anticipatory of needs than finished texts or monographs, yet of immediate interest because of the novelty of its treatment of an application or of mathematics being applied or lying close to applications.

The aim of the series is, through rapid publication in an attractive but inexpensive format, to make material of current interest widely accessible. This implies the absence of excessive generality and abstraction, and unrealistic idealization, but with quality of exposition as a goal.

Many of the books will originate out of and will stimulate the development of new undergraduate and graduate courses in the applications of mathematics. Some of the books will present introductions to new areas of research, new applications and act as signposts for new directions in the mathematical sciences. This series will often serve as an intermediate stage of the publication of material which, through exposure here, will be further developed and refined. These will appear in conventional format and in hard cover.

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The Editors welcome all inquiries regarding the submission of manuscripts for the series. Final preparation of all manuscripts will take place in the editorial offices of the series in the Division of Applied Mathematics, Brown University, Providence, Rhode Island.


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J.P. LaSalle

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# FOREWORD

Professor J. P. LaSalle died on July 7, 1983 at the age of 67. The present book is being published posthumously with the careful assistance of Kenneth Meyer, one of the students of Professor LaSalle. It is appropriate that the last publication of Professor LaSalle should be on a subject which contains many interesting ideas, is very useful in applications and can be understood at an undergraduate level. In addition to making many significant contributions at the research level to differential equations and control theory, he was an excellent teacher and had the ability to make sophisticated concepts appear to be very elementary. Two examples of this are his books with N. Hasser and J. Sullivan on analysis published by Ginn and Co., 1949 and 1964, and the book with S. Lefschetz on stability by Liapunov's second method published by Academic Press, 1961. Thus, it is very fitting that the present volume could be completed.

Jack K. Hale
Kenneth R. Meyer

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