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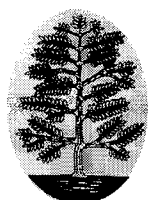
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Mathematics Inspired by Biology

Lectures given at the 1st Session of the
Centro Internazionale Matematico Estivo
(C.I.M.E.) held in Martina Franca, Italy,
June 13–20, 1997

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Preface

The Centro Internazionale Matematico Estivo (CIME), organised on June 13 - 20 1997 a summer course on **MATHEMATICS INSPIRED BY BIOLOGY** in the Ducal Palace of Martina Franca (a nice baroque village in Apulia, Italy).

Progress in applied mathematics often derives from co-ordinated efforts to bring the challenges of specific applications into agreement with the quest of intrinsic and general mathematical structure. In this spirit, the aim of the course was to demonstrate how mathematical problems, ideas, methods and results arise from attempts to describe, analyse and understand the world of living systems. A wide spectrum of mathematical and biological subjects was covered. The intention, to give to beginning researchers a stimulating impression of the current state-of-the-art in a selected number of fields, is echoed in the present lecture notes.

In this book you find the written account of five series of six lectures each. The common theme is the role of structure in shaping transient and ultimate dynamics. But the type of structure ranges from spatial (Haderer and Maini in the deterministic setting, Durrett in the stochastic setting) to physiological (Diekmann) and order (Smith). Each contribution sketches the present state of affairs while, by including some wishful thinking, pointing at open problems that deserve attention. No doubt this book will be superseded before many years have passed, but most likely it will itself catalyse the process by which our knowledge and understanding is enhanced and extended.

The co-ordinators are most grateful to CIME for giving us the opportunity to gather excellent lecturers and a surprisingly large crowd of bright and enthusiastic students, coming from about 15 countries and ranging from Mathematicians, Physicists, Biologists, Physicians, Engineers, in a truly ideal Apulian setting. No doubt the organisation could have been painful; but the assistance of Daniela Morale and Alessandra Micheletti was so much beyond the call of duty that it was actually a pleasure. To them, to the wonderful students and (last but certainly not least) to the authors that showed so much sense of responsibility for producing a readable text, we extend our warmest thanks.

Financial support from CIME and European Union is gratefully acknowledged. Finally we like to thank the Mayor, the Secretary General, and all the staff of the Town Council of Martina Franca, that offered the XVII's century Ducal Palace as the site of the course, for the warm hospitality and continuous assistance.

Milano and Utrecht, July 8 1998,

Vincenzo Capasso and Odo Diekmann

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