

Contents

Series Editors' Preface vii

Editors' Introduction ix

Part I Numerical Tools and Modelling

Modelling Mappings: An Aim and a Tool for the
Study of Dynamical Systems
Claude Froeschlé and Elena Lega 3

Spectra of Stretching Numbers and Helicity Angles
George Contopoulos and Nikos Voglis 55

Diffusion and Transient Spectra in a 4-Dimensional
Symplectic Mapping
Christos Efthymiopoulos, Nikos Voglis and George Contopoulos 91

Distribution of Periodic Orbits in 2-D Dynamical Systems
Evangelia Grousouzakou and George Contopoulos 107

Symplectic Integrators
Jacques Henrard 133

Part II Analytical Methods

Rigorous and Numerical Determination of Rotational
Invariant Curves for the Standard Map
Alessandra Celletti 149

Interpolation of Discrete Hamiltonian Systems
Annamaria Di Sebastiano and Giorgio Turchetti 181

Standard and Anomalous Diffusion in Dynamical Systems
Massimo Vergassola 229

Part III Examples of Application

Symplectic Maps and Their Use in Celestial Mechanics <i>John D. Hadjidemetriou</i>	249
Perturbation Theory for Volume Preserving Maps: Application to the Magnetic Field Lines in Plasma Physics <i>Armando Bazzani and Annamaria Di Sebastiano</i>	283
The Use of Mappings for Stability Problems in Beam Dynamics <i>Ezio Todesco</i>	301
Index	315