## TABLE OF CONTENTS

Preface	ix
Group Photograph	xii
List of Speakers and Participants	xiii
PART I: PLANETARY DYNAMICS	
B.A. CONWAY and T.J. ELSNER / Dynamical Evolution of Planetary Systems and the Significance of Bode's Law	3
B.A. CONWAY and R.E.ZELENKA / Further Numerical Investigations into the Significance of Bode's Law	13
K.A. INNANEN and S. MIKKOLA / Where are the Saturnian Trojans?	21
J. KOVALEVSKY / Orbital Evolution	27
P.J. MESSAGE / Planetary Perturbation Theory from Lie Series, including Resonance and Critical Arguments	47
A. MILANI / Secular Perturbations of Planetary Orbits and their Representation as Series	73
A.M. NOBILI / The Accumulation of Integration Error	109
D.E. SNOW / Numerical Regularization of the Lagrange Planetary Equations	117
PART II: DYNAMICS OF NATURAL AND ARTIFICIAL SATELLITES	
K. AKSNES / General Formulas for Three-Body Resonances	125
M. ARRIBAS and M.L. SEIN-ECHALUCE / Analytical Methods for the Radial Intermediaries	141
E. BOIS / Analytical Theory of the Rotation of an Artificial Satellite	149
R. BROUCKE and A. KONOPLIV / Some Models for the Motion of the Co-orbital Satellites of Saturn	155
M. CARPINO / Long-period Changes in the Semimajor Axis of Lageos	171

## PART II: DYNAMICS OF NATURAL AND ARTIFICIAL SATELLITES

F. DELHAISE and M. MOONS / Effects of a Non-circular Shepherd upon a Planetary Ring	173
J.M. FERRANDIZ and M.E. SANSATURIO / General Motion of a Triaxial Rigid Body in a Newtonian Force Field	181
D. HARPER / The Motion of the Orbit Plane of Iapetus	189
D.A. KAYA, L.A. McCARTER and J.J. F.LIU / Astrodynamics in the Real-World Environment (The Whole Truth and Nothing but the Truth).	193
A.E. ROY and B.A. STEVES / A Finite-Time Stability Criterion for Sun-perturbed Planetary Satellites	197
M.L. SEIN-ECHALUCE and J.M. FRANCO / A New Radial Inter- mediary and its Numerical Integration	217
J. WALDVOGEL and F. SPIRIG / Co-orbital Satellites and Hill's Lunar Problem	223
PART III: DYNAMICS OF ASTEROIDS	
P. FARINELLA, CL. FROESCHLE and Z. KNEŽEVIĆ / The Puzzle of Asteroid Families	237
S. FERRAZ-MELLO / High Eccentricity Libration	245
CH. FROESCHLÉ and H. SCHOLL / Evolution of Asteroidal Orbits Located in the Main Secular Resonances $\nu_5, \nu_6$ and $\nu_{16}$	251
J.D. HADJIDEMETRIOU / Algebraic Mappings Near a Resonance with an Application to Asteroid Motion	257
J. POJMAN and V. SZEBEHELY / The Hierarchical Restricted Problem with Applications	277
M. YOSHIKAWA / The Motions of Asteroids in the Secular Resonance v <sub>6</sub> : an Analytical Model and Numerical Calculations	289
PART IV: DYNAMICS OF STARS AND GALAXIES	
N. CARANICOLAS and CH. VOZIKIS / Families of Periodic Orbits in a Model of Interacting Galaxies	297
G. CONTOPOULOS / Qualitative Characteristics of Dynamical Systems	301
F.M.F. EL-SABAA and H.H. SHERIEF / On the Galactic Motion	317
D.C. HEGGIE / The N-Body Problem in Stellar Dynamics	329
B. ZAFIROPOULOS / Rotationally and Tidally Perturbed Orbital Elements of Close Binary Stars	349

## PART V: OTHER SPECIFIC TOPICS IN DYNAMICS

A. BENSENY and A. OLVERA / Escape and Capture in the Restricted Three Body Problem (RTBP)	357
J.G. BRYANT / A Formulation of the N-body Problem where the Velocities are Bounded	363
A. CELLETTI and L. CHIERCHIA / A Report on Some New KAM Estimates	371
J. M. FERRÁNDIZ / Extended Canonical Transformations Increasing the Number of Variables	377
J. FONT and M. GRAU / Non Local Spiraling Characteristic Curves	385
C. FROESCHLÉ and J.L. GAUTERO /Connectance and Stability of Linear Differential Systems	393
J. HENRARD / Resonances in the Planar Elliptic Restricted Problem	405
C. MARCHAL / The Near-Resonance Theorem: Analysis of the Vicinity of Periodic Solutions of Analytic Differential Systems	427
J. MASDEMONT / Homoclinic and Heteroclinic Solutions of the RTBP Joining the Triangular Equilibrium Points	449
M. OLLÉ / Double Collision Orbits and Second Species Solutions in the Restricted Three-Body Problem	457
A.D. PINOTSIS / Bifurcations and Instabilities in the Restricted Three-Body Problem	465
F. PUEL / Three Dimensional Equations of Szebehely of the Inverse Problem and Frenet Reference Frame	471
J.F. SEGREST, J.J.F. LIU and V.G. SZEBEHELY / Fourier Transform in Astrodynamics	477
C. SIMÓ / Estimates of the Error in Normal Forms of Hamiltonian Systems. Applications to Effective Stability and Examples	481
A. SUSIN / Passages Near Triple Collision	505
H. YOSHIDA / Non-Integrability of Hamiltonian Systems Based on Ziglin's Theorem	513
Index of Names	515
Index of Subjects	521