

TABLE OF CONTENTS

Preface ix

Conference photograph xi

List of participants xv

List of contributors xvii

I. WAVES IN PHYSICAL SYSTEMS

Competing interactions and complexity in condensed matter
A.R. Bishop 1

Exact solutions of the Boltzmann equation
H. Cornille 39

Nonlinear interaction between short and long waves
V.I. Karpman 83

Nonlinear optics
A.C. Newell, J.V. Moloney 161

The phase diffusion and mean drift equations for convection at finite Rayleigh numbers in large containers I
A.C. Newell, T. Passot, M. Souli 163

Nonlinear evolution equations, quasi-solitons and their experimental manifestation
M. Remoissenet 165

The initial-boundary value problem for the Davey-Stewartson 1 equation; how to generate and drive localized coherent structures in multidimensions
P.M. Santini, A.S. Fokas 223

II. INSTABILITIES AND DEFECTS

Ginzburg-Landau models of non-equilibrium
P. Coullet, L. Gil 261

Nonlinear Ginzburg-Landau equation and its application to fluid-mechanics
Y. Pomeau 277

Defects and disorder of nonlinear waves in convection
R. Ribotta, A. Joets 279

III. CONCEPTS OF INTEGRABILITY AND SINGULARITY ANALYSIS

An introduction to Kowalevski's exponents
D. Bessis 299

Singularity analysis and its relation to complete, partial and non-integrability
M.D. Kruskal, A. Ramani, B. Grammaticos 321

A concept of integrability based on the symmetry approach
A.V. Mikhailov 373

Bäcklund transformations and the Painlevé property	
<i>J. Weiss</i>	375
IV. MATHEMATICAL METHODS	
Differential geometry techniques for sets of nonlinear partial differential equations	
<i>F.B. Estabrook</i>	413
Inertial manifolds and attractors of partial differential equations	
<i>J.M. Ghidaglia</i>	435
Hirota's bilinear method and partial integrability	
<i>J. Hietarinta</i>	459
Generalized symmetries, recursion operators and bihamiltonian systems	
<i>Y. Kosmann-Schwarzbach</i>	479
Nonlinear dispersive equations without inverse scattering	
<i>J.-C. Saut</i>	491
Group theory and exact solutions of partially integrable differential systems	
<i>P. Winternitz</i>	515
CONTRIBUTED PAPERS	
The nonlinear evolution equation for the order parameter in superfluid Helium-Four	
<i>R. Balakrishnan</i>	569
Quasimonomial transformations and integrability	
<i>L. Brenig, A. Goriely</i>	571
Partial integrability of the damped kink equation	
<i>J.M. Cerveró, P.G. Estévez</i>	573
New similarity reductions of Boussinesq-type equations	
<i>P.A. Clarkson</i>	575
The homographic invariance of PDE Painlevé analysis	
<i>R. Conte</i>	577
The nonlocal amplitude equation	
<i>F.J. Elmer, T. Christen</i>	579
Pressure waves in fluid-filled nonlinear viscoelastic tubes	
<i>H.A. Erbay, S. Erbay</i>	581
Elliptic function solutions for Landau-Ginzburg equation	
<i>A.M. Grundland, J.A. Tuszyński, P. Winternitz</i>	583
Application of a Macsyma program for the Painlevé test to the Fitzhugh-Nagumo equation	
<i>W. Hereman</i>	585
The strongly dissipative Toda lattice	
<i>T. Kuusela, J. Hietarinta</i>	587

A perturbative approach to Hirota’s bilinear equations of KdV-type
 F. Lambert, R. Willox 589

Construction of two dimensional super potentials for classical super systems
 S.C. Mishra 591

Applications of nonlinear PDE’s to the modelling of ferromagnetic inhomogeneities
 J.A. Tuszyński, P. Winternitz, A.M. Grundland 593

AUTHOR INDEX 595

SUBJECT INDEX 597