## CONTENTS

			1
CHAPTER	1 1 2 3 4	PHYSICAL FRAMEWORK	3 3 .0 .2
CHAPTER	2 1 2 3	INTRODUCTORY CONCEPTS FOR WAVE MOTIONS1The kinematic wave equation and the shock-fitting1Basic properties of asymptotic expansions2The perturbation-reduction method3	.8 19 29 36
CHAPTER	3 1 2	RAY METHODS FOR LINEAR WAVES4Phase and group velocity of a wave train4Two-timing methods4	14 15 19
CHAPTER	4 1 2	RAY METHODS FOR NONLINEAR HYPERBOLIC WAVES5Asymptotic waves for quasilinear systems5Acoustic waves in a gravitational atmosphere6	57 58 52
CHAPTER	5 1 2 3 4	RAY METHOD FOR THE PROPAGATION OF DISCONTINUITIES  6    General formalism  6    The evolution of weak discontinuities  7    Characteristic shocks  7    Intermediate discontinuities  7	58 59 71 74 75
CHAPTER	6 1 2	GENERALIZED WAVEFRONT EXPANSION FOR WEAK SHOCKS  7    Derivation of the basic equations  7    Geometrical interpretation and applications to acoustic  7    shocks in a constant state  8	'8 '9 33
	3	Relationship with weakly nonlinear geometrical optics 8	35
CHAPTER	3 7 1 2 3	Relationship with weakly nonlinear geometrical optics  8    SMALL TIME ANALYSIS AND SHOCK STABILITY  8    One dimensional analysis  9    Multidimensional case  9    Propagation into a constant state and  9	35 ;9 ;0 ;4

## CONTENTS

CHAPTER	8	RAY METHODS FOR NONLINEAR DISPERSIVE WAVES $104$
	1	Perturbation-reduction methods in several dimensions:
		derivation of the generalized Kdv or Burgers equations 104
	2	Solutions of the generalized KdV equation
	3	Applications to plasmas
	4	Derivation of the generalized KP
		equation: application to plasmas
	5	Derivation of the generalized nonlinear
		Schrödinger equation
	6	Derivation of the KP equation for magnetosonic waves 123
CHAPTER	9	RAY METHODS FOR NONLINEAR DISSIPATIVE WAVES $132$
	1	The generalized Burgers equation
	2	Acoustic waves in a thermoviscous fluid
	3	Two-dimensional Burgers equation
	4	Collisional plasma
CHAPTER	10	INTERACTION OF DISPERSIVE WAVES
	1	The tri-resonance condition
	2	Quadratically nonlinear interaction of dispersive waves 146
	3	A long wave equation
	4	Internal waves
	5	Passage through resonance
CHAPTER	11	INTERACTION OF HYPERBOLIC WAVES
	1	The tri-resonance condition for
		scale invariant wave motions
	<b>2</b>	Resonant interactions of hyperbolic
		waves in one space dimension
	3	The tri-resonance condition for hyperbolic waves 192
	4	Resonant interaction of hyperbolic waves
		in several space dimensions
	5	Gas dynamics
	6	Elasticity
		Appendix A1
		Appendix A2
		Appendix A3
		Appendix A4
		Appendix A5
		Appendix A6
		Appendix A7
		Subject Index