

Contents

<i>Preface</i>	<i>page</i> ix
<i>List of Contributors</i>	xiii
Part I. Bénard and Thermocapillary Instabilities	1
1 Nonlinear Dynamics of Thin Evaporating Liquid Films Subject to Internal Heat Generation	3
ALEXANDER ORON	
2 The Effect of Air Height on the Pattern Formation in Liquid-Air Bilayer Convection	15
D. JOHNSON, R. NARAYANAN, AND P. C. DAUBY	
3 The Third Type of Benard Convection Induced by Evaporation	31
WEN-JEI YANG	
4 Waves Generated by Surface-Tension Gradients and Instability	43
M. G. VELARDE, A. YE, REDNIKOV, AND H. LINDE	
5 Thermocapillary-Coriolis Instabilities	57
ABDELFATTAH ZEBIB AND CEDRIC LE CUNFF	
Part II. Shear and Pressure Driven Instabilities	71
6 Control of Instability in a Liquid Film Flow	73
S. P. LIN AND J. N. CHEN	
7 Three-Dimensional Waves in Thin Liquid Films	85
A. A. NEPOMNYASHCHY	
8 Modulation Wave Dynamics of Kinematic Interfacial Waves	99
H.-C. CHANG, E. A. DEMEKHIN, R. M. ROBERTS, AND Y. YE	
9 Multifilm Flow Down an Inclined Plane: Simulations Based on the Lubrication Approximation and Normal-Mode Decomposition of Linear Waves	112
C. POZRIKIDIS	
10 Spatial Evolution of Interfacial Waves in Gas-Liquid Flows	129
M. J. McCREADY	
II The Shear Breakup of an Immiscible Fluid Interface	142
GRETAR TRYGGVASON AND SALIHOZEN UNVERDI	
12 Two-Fluid-Layer Flow Stability	156
S. OJZGEN, G. S. R. SARMA, G. DEGREZ, AND M. CARBONARO	

Part III. Waves and Dispersion	169
13 On Modeling Unsteady Fully Nonlinear Dispersive Interfacial Waves THEODORE YAOTSU WU	171
14 Instabilities in the Coupled Equatorial Ocean-Atmosphere System HENK A. DIJKSTRA AND PAUL C. F. VAN DER VAART	179
15 Large-Amplitude Solitary Wave on a Pycnocline and Its Instability DANIEL T. VALENTINE, BRIAN C. BARR, AND TIMOTHY W. KAO	198
16 Stability and Pattern Selection in Parametrically Driven Surface Waves PEILONG CHEN AND JORGE VIÑALS	211
17 Deformation and Rupture in Confined, Thin Liquid Films Driven by Thermocapillarity MARC K. SMITH AND DAVID R. VRANE	221
18 Linear and Nonlinear Waves in Flowing Water CHIA-SHUN YIH AND WILLIAM W. SCHULTZ	234
19 Pinned-Edge Faraday Waves DIANE M. HENDERSON AND JOHN W. MILES	246
20 Interfacial Shapes in the Steady Flow of a Highly Viscous Dispersed Phase DANIEL D. JOSEPH AND RUNYUAN BAI	254
Part IV. Multiphase Systems	263
21 Interaction between Fluid Flows and Flexible Structures WEI SHYY, HENG-CHUAN KAN, H. S. UDAYKUMAR, AND ROGER TRAN-SON-TAY	265
22 Numerical Treatment of Moving Interfaces in Phase-Change Processes SURESH V. GARIMELLA AND JAMES E. SIMPSON	278
23 Accuracy and Convergence of Continuum Surface-Tension Models M. W. WILLIAMS, D. B. KOTHE, AND E. G. PUCKETT	294
24 Interaction of Convection and Solidification at Fluid-Solid Interfaces L. BÜHLER, A. EHRHARD, AND U. MÜLLER	306
25 Interfacial Motion of a Molten Layer Subject to Plasma Heating P. S. AYYASWAMY, S.S. SRIPADA, AND I. M. COHEN	320
26 The Fluid Mechanics of Premelted Liquid Films M. G. WORSTER AND J. S. WETTLAUFER	339
27 Recent Advances in Lattice Boltzmann Methods SHIYI CHEN, GARY D. DOOLEN, XIAOYI HE, XIAOBO NIE, AND RAOYANG ZHANG	352
28 Bubble Dynamics in Heterogeneous Boiling Heat Transfer RENWEI MEI, JAMES F. KLAUSNER, AND GLEN THORNCROFT	364
Part V. Complex Flows	379
29 Heat, Mass, and Momentum Exchanges between Outer Flow and Separation Bubble behind a Single Backward-facing Step with Gas Injection from One Duct Wall TONG-MIIN LIOU AND PO-WEN HWANG	381
30 A Moving Boundary Problem Arising from Stratigraphic Modeling J. MARR, J. B. SWENSON, AND V. R. VOLLER	393

31	Convection Generated by Lateral Heating of a Solute Gradient: Review and Extension C. F. (HEN	403
32	Heat Conduction from a Solid Particle and the Force on It in Stokes Flow in a Fluid with Position-Dependent Physical Properties ANDREASACRIVOS AND YONGGUANG WANG	413
33	Radiation-Affected Ignition Phenomena with Solid-Gas Interaction SEUNG-WOOK BAEK AND JAE HYUN PARK	427
34	Biomagnetic Fluid Dynamics YOUSEF HAIK, VINAY M. PAI, AND CHING-JEN CHEN	439
	The Man I Know: Chia-Shun Yih, July 25, 1918-April 25, 1997 YUAN-CHENG FUNG	453
	Index	459