## CONTENTS

List of Publications		
General Introduction: The Worlds of Science		
Section A. Fundamental Issues in Hydrodynamics, Condensed Matter and Field Theory		
From Level to Level	7	
1. On Two Levels [114]	11	
2. Hydrodynamic Equations and Correlation Functions [11] (with P. C. Martin)	13	
3. The Electron-Phonon Interaction in Normal and Superconducting		
Metals [17]	64	
4. Wave Function Fluctuations in Finite Superconductors [29]	100	
5. The Application of Renormalization Group Techniques to Quarks		
and Strings [58]	104	
6. Disorder Variables and Para-Fermions in Two-Dimensional	104	
Statistical Mechanics [74]	134	
(with E. Fradkin)  7. Computational Physics, Physics and Minuses [115]	140	
7. Computational Physics: Pluses and Minuses [115]	$\frac{149}{151}$	
8. Cathedrals and Other Edifices [117] 9. From Neutrinos to Quasiparticles [124]	151	
7. From Redutinos to Quasiparticles [124]	100	
Section B. Scaling and Phase Transitions		
On the Joys of Creation	157	
1. Scaling Laws for Ising Models Near $T_c$ [22]	165	
2. Static Phenomena Near Critical Points: Theory and Experiment [26]	175	
(with W. Götze, D. Hamblen, R. Hecht, E. A. S. Lewis,		
V. V. Palciauskas, M. Rayl, J. Swift, D. Aspnes, and J. W. Kane)		
3. Transport Coefficients Near Critical Points [30]	212	
4. The Droplet Model and Scaling [38]	217	
5. Critical Behavior. Universality and Scaling [39]	222	
6. Scaling, Universality and Operator Algebras [54]	240	
7. Teaching the Renormalization Group [62]	274	
(with H. J. Maris)		
8. Scaling and Universality in Statistical Physics [135]	280	

Section C. Simulations, Urban Studies, and Social Systems	
Models and Arguments	297
<ol> <li>Computer Display and Analysis of Urban Information         Through Time and Space [37]         (with J. R. Voss and W. J. Bouknight)</li> <li>From Simulation Model to Public Policy: An Examination</li> </ol>	301
of Forrester's "Urban Dynamics" [42]	328
3. Public Policy Conclusions from Urban Growth Models [46] (with H. Weinblatt)	336
4. A Simulation Model of Urban Labor Markets and	
Development Policy [51]	343
(with B. Harrison and B. Chinitz) 5. The Big, the Bad and the Beautiful [127]	270
6. Hard Times [152]	378 380
	000
Section D. Turbulence and Chaos	
Questions without Answers	385
<ol> <li>Roads to Chaos [93]</li> <li>Chaos: A View of Complexity in the Physical Sciences [113]</li> <li>From Periodic Motion to Unbounded Chaos: Investigations of the</li> </ol>	391 399
Simple Pendulum [99]	430
4. Escape from Strange Repellers [96]	435
<ul> <li>(with C. Tang)</li> <li>5. Global Universality at the Onset of Chaos: Results of a Forced Rayleigh-Benard Experiment [106]</li> <li>(with M. H. Jensen, A. Libchaber, I. Procaccia and J. Stavans)</li> </ul>	439
6. Fractal Measures and Their Singularities: The Characterization of Strange Sets [109]  (with T. C. Halsey, M. H. Jensen, I. Procaccia, and B. I. Shraiman)	443
7. Fractals: Where's the Physics [110]	454
8. Scaling and Multiscaling (Fractals and Multifractals) [141]	456
9. Complex Analytic Methods for Viscous Flows in Two Dimensions [107] (with D. Bensimon, S. Liang, B. I. Shraiman, and C. Tang)	484
10. On Complexity [119]	516
<ul><li>11. Interactive Computation for Undergraduates [131]</li><li>12. Scaling and Structures in the Hard Turbulence Region of</li></ul>	518
Rayleigh Benard Convection [134]	520

13.	Turbulence dans une Boîte [147]	528
	(with A. Libchaber, E. Moses and G. Zocchi)  Complex Structures from Simple Systems [149]	537
15.	Bubble, Bubble, Boil and Trouble [151] (with D. H. Rothman)	539

Numbers in brackets refer to the numbers in the list of publications on pp. xi-xvii.