

Table of Contents

Part I	Physics
1. Nonadiabatic Processes in Surface Physics. By T. B. Grimley	3
2. Dielectrics - the Fröhlich Connection By D. G. Frood, T. J. Gallagher, and B. K. P. Scaife	11
3. Some comments on the Role of Electrodes in Dielectric Breakdown of Solids By J. J. O'Dwyer	16
4. Multipolar Fluctuations in a Dielectric Sphere. By B. K. P. Scaife	21
5. Nonlinear Physics of Electronic and Optical Materials for Submicron Device Applications. By T. W. Barrett (with 12 Figures)	24
6. Relativistic Characteristics of Electrons in Simple Nonparabolic Energy Bands By P. T. Landsberg	49
7. Breakdown of Invariants in Nonlinear Systems By L. E. Reichl and W. A. Lin (with 4 Figures)	54
8. Dynamics of Interacting Electrons in Aperiodic Solids By M. Pollak (with 2 Figures)	61
9. Quantum Statistical Basis of Thermodynamics with Phase Structure By G. L. Sewell (with 5 Figures)	75
10. On Molecular Control. By T. W. Barrett	93
11. Structure of Liquid 1-alkanols and Some Isomers By W. G. Scaife (with 7 Figures)	98
12. Surface Transport in Time and Frequency Domains By A. K. Jonscher (with 13 Figures)	112
13. Absolute Entropy and the Problem of Microscopic Measurement. By L. Tisza . . .	136
14. From Theoretical Physics to Biology: the Forward Path of Theory with Herbert Fröhlich. By G. J. Hyland	146

Part II	Biophysics
15. On Davydov Solitons at 310 K. By A. C. Scott	167
16. Comparisons of Optical Absorption by Impurity Center and by Polarons in Crystalline Acetanilide. By J. A. Krumhansl (with 1 Figure)	174
17. The Vibrational Soliton: an Experimental Overview. By I. J. Bigio (with 4 Figures)	181
18. Long-lived and Large-coherence Length Excitations in the DNA Double Helix By E. W. Prohofsky (with 1 Figure)	188

19. Far Infrared Spectra of Biomolecules. By J. B. Hasted (with 5 Figures)	198
20. Spectral Dimensions of Paramagnetic Proteins By H. J. Stapleton (with 11 Figures)	210
21. The Role of Chaos in Biological Systems. By F. Kaiser (with 5 Figures)	224
22. Non-Thermally Excited Modes and Free Energy Transduction in Proteins and Biological Membranes. By D. B. Kell	237
23. Herbert Fröhlich, and the New Biophysics of Cooperativity. By H. A. Pohl	247
24. Opposite Long-range Interactions Between Normal and Malignant Cells By W. Nagl and F. A. Popp (with 3 Figures)	248
25. Hopping Charge Carriers in Molecular Crystals and Biopolymers: the Fröhlich Connection. By R. Pethig (with 3 Figures)	257
26. Cellular Molecular Processes Driven by Cell-Generated AC Electric Field By E. Del Giudice, S. Doglia, M. Milani, and G. Vitiello	264
27. Evidence for AC Fields from Living Biological Cells By H. A. Pohl, W. T. Phillips, and J. K. Pollock (with 4 Figures)	273
28. On Morphogenesis in Living Systems. By F. W. Cummings (with 3 Figures)	287
29. Generalities: Living Systems and Dielectrics. By C. W. Smith	303
30. Dielectric Spectroscopy, Dielectrophoresis and Field Interactions with Biological Materials. By H. P. Schwan (with 4 Figures)	317
31. Condensed Matter Physics and the Biology of the Future. By S. Rowlands	328
Publications of H. Fröhlich from 1930–1985	335
Subject Index	347