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| Nota di contenuto | Contents ; Preface to the Second Edition ; Preface to the First Edition ; Chapter 1 Historical Background and Introductory Concepts ; 1.1 Brownian Motion ; 1.2 Einstein's Explanation of the Brownian Movement ; 1.3 The Langevin Equation ; 1.4 Einstein's Method ; 1.5 Necessary Concepts of Statistical Mechanics ; 1.6 Probability Theory ; 1.7 Application to the Langevin Equation ; 1.8 Wiener Process ; 1.9 The Fokker-Planck Equation ; 1.10 Drift and Diffusion Coefficients ; 1.11 Solution of the One-Dimensional Fokker-Planck Equation ; 1.12 The Smoluchowski Equation ; 1.13 Escape of Particles over Potential Barriers - Kramers' Escape Rate Theory ; 1.14 Applications of the Theory of Brownian Movement in a Potential ; 1.15 Rotational Brownian Motion - Application to Dielectric Relaxation |

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| 1.16 Superparamagnetism - Magnetic After-Effect | |
| 1.17 Brown's Treatment of Neel Relaxation | |
| ; 1.18 Asymptotic Expressions for the Neel Relaxation Time | |
| ; 1.19 Ferrofluids | ; 1.20 Depletion Effect in a Biased |
| Bistable Potential | ; 1.21 |
| Stochastic Resonance | ; 1.22 Anomalous Diffusion |
| References | Chapter 2 Langevin Equations and Methods of |
| Solution | ; 2.1 Criticisms of the |
| Langevin Equation | ; 2.2 Doob's |
| Interpretation of the Langevin Equation | |
| ; 2.3 Nonlinear Langevin Equation with a Multiplicative Noise Term: Ito | |
| and Stratonovich Rules | |
| 2.4 Derivation of Differential-Recurrence Relations from the One- | |
| Dimensional Langevin Equation | |

Sommario/riassunto

This volume is the second edition of the first-ever elementary book on the Langevin equation method for the solution of problems involving the Brownian motion in a potential, with emphasis on modern applications in the natural sciences, electrical engineering and so on. It has been substantially enlarged to cover in a succinct manner a number of new topics, such as anomalous diffusion, continuous time random walks, stochastic resonance etc, which are of major current interest in view of the large number of disparate physical systems exhibiting these phenomena. The book has been written in suc
