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Autore	Avinasa Kumara
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Collana	Springer Theses
Disciplina	016.54532
Soggetti	Colloids - Freezing
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Supervisor's Foreword -- Acknowledgments -- Contents -- Parts of This Thesis Have Been Published in the Following Journal Articles -- 1 Introduction -- 1.1 History of the Mpemba Effect -- 1.2 Explanations for the Mpemba Effect -- 1.3 Mpemba Effect in Other Systems -- 1.3.1 Experiments -- 1.3.2 Numerical Studies -- 1.4 Mpemba Effect in Colloidal Systems -- 1.5 Particle Manipulation Techniques -- 1.5.1 Passive Trapping -- Optical Tweezers -- Magnetic Tweezers -- Holographic Tweezers -- 1.5.2 Active Trapping -- Electrokinetic Traps -- Hydrodynamic Traps -- Acoustic Traps -- Thermal Traps -- 1.6 Combining Feedback Traps and Optical Tweezers -- 1.7 Overview of the Thesis -- References -- 2 Particle Dynamics -- 2.1 The Langevin Equation -- 2.1.1 A Free Particle -- 2.1.2 A Trapped Particle -- 2.2 Fokker-Planck Equation -- 2.2.1 Adjoint of the Fokker-Planck Operator -- 2.2.2 Eigenfunctions and Eigenvalues of the Fokker-Planck Operator -- 2.2.3 Fokker-Planck Equation with no Drift -- 2.3 Heat Equation -- 2.4 Supplementary Information -- 2.4.1 A Similarity Transformation of the Fokker-Planck Operator -- References -- 3 Optical Feedback Traps -- 3.1 Principles of Optical Tweezers -- 3.2 Optical Tweezers Setup -- 3.2.1 Faraday Isolator -- 3.2.2 Acousto-Optic Deflector -- 3.2.3 Detection Scheme -- 3.2.4 Control and Data Acquisition -- 3.3 Sample Preparation -- 3.4 Calibration -- 3.4.1 Position Calibration -- 3.4.2 Trap-Stiffness Calibration -- 3.5 Virtual

Harmonic Potential -- 3.6 Isotropic Traps -- 3.7 Virtual Double-Well Potential -- 3.8 Discussion -- References -- 4 Mpemba Effect -- 4.1 Definition of the Mpemba Effect -- 4.2 Energy Landscape for the Mpemba Effect -- 4.2.1 Choice of Potential Energy Landscape -- 4.3 Imposing an Instantaneous Quench via Initial Conditions -- 4.4 Measuring the Distance to Equilibrium -- 4.4.1 L1 distance Distance. 4.4.2 Kullback-Leibler (KL) Divergence -- 4.5 Observation of the Mpemba Effect in Asymmetric Domains -- 4.6 Analysis Based on Eigenfunction Expansion -- 4.6.1 Calculation of the  $a_2$  Coefficient -- 4.6.2 Relationship Between  $D$  and the  $a_2$  Coefficient -- 4.7 Strong Mpemba Effect -- 4.8 Geometric Interpretation of the Mpemba Effect -- 4.8.1 Thermalization in a Double-Well Potential with Metastability -- 4.8.2 Metastable Mpemba Effect -- 4.8.3 Metastable Mpemba Effect in Terms of Extractable Work -- 4.9 Discussion -- 4.10 Supplementary Information -- 4.10.1 Infinite Potential vs. Finite Potential -- 4.10.2 Calculation of Equilibration Time -- 4.10.3 Equilibration Time Versus the  $a_2$  Coefficient -- 4.10.4 Barrier Height vs. Discontinuity in Local Equilibrium -- References -- 5 Inverse Mpemba Effect -- 5.1 Energy Landscape for the Inverse Mpemba Effect -- 5.2 Inverse Mpemba Effect in an Asymmetric Potential -- 5.3 Analysis Based on Eigenfunction Expansion -- 5.4 Discussion -- References -- 6 Higher-Order Mpemba Effect -- 6.1 Experiment -- 6.2 Eigenfunction Analysis -- 6.3 Mpemba Effect in a Potential with One Local Minimum -- 6.4 Discussion -- Reference -- 7 Conclusions -- 7.1 Summary of the Results Obtained -- 7.2 Final Remarks -- References.

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2. Record Nr.	UNINA9910254140903321
Autore	Mukherjee Sanjoy
Titolo	Organic Radical Polymers : New Avenues in Organic Electronics // by Sanjoy Mukherjee, Bryan W. Boudouris
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2017
ISBN	3-319-58574-6
Edizione	[1st ed. 2017.]
Descrizione fisica	1 online resource (IX, 80 p. 42 illus. in color.)
Collana	SpringerBriefs in Materials, , 2192-1091
Disciplina	547.139
Soggetti	Optical materials Electronics - Materials Polymers Electronic circuits Energy storage Electronics Microelectronics Chemistry, Organic Optical and Electronic Materials Polymer Sciences Electronic Circuits and Devices Energy Storage Electronics and Microelectronics, Instrumentation Organic Chemistry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Chapter 1. An Introduction to Radical Polymers -- Chapter 2. Syntheses of Radical Polymers -- Chapter 3. Applications of Radical Polymers in Electrolyte-supported Devices -- Chapter 4. Applications of Radical Polymers in Solid-state Devices -- Chapter 5. Conclusions and Future Outlook.
Sommario/riassunto	This book provides a detailed introduction to organic radical polymers and open-shell macromolecules. Functional macromolecules have led

to marked increases in a wide range of technologies, and one of the fastest growing of these fields is that of organic electronic materials and devices. To date, synthetic and organic electronic device efforts have focused almost exclusively on closed-shell polymers despite the promise of open-shell macromolecules in myriad applications. This text represents the first comprehensive review of the design, synthesis, characterization, and device applications of open-shell polymers. In particular, it will summarize the impressive synthetic and device performance efforts that have been achieved with respect to energy storage, energy conversion, magnetic, and spintronic applications. By combining comprehensive reviews with a wealth of informative figures, the text provides the reader with a complete “molecules-to-modules” understanding of the state of the art in open-shell macromolecules. Moreover, the monograph highlights future directions for open-shell polymers in order to allow the reader to be part of the community that continues to build the field. In this way, the reader will gain a rapid understanding of the field and will have a clear pathway to utilize these materials in next-generation applications.

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