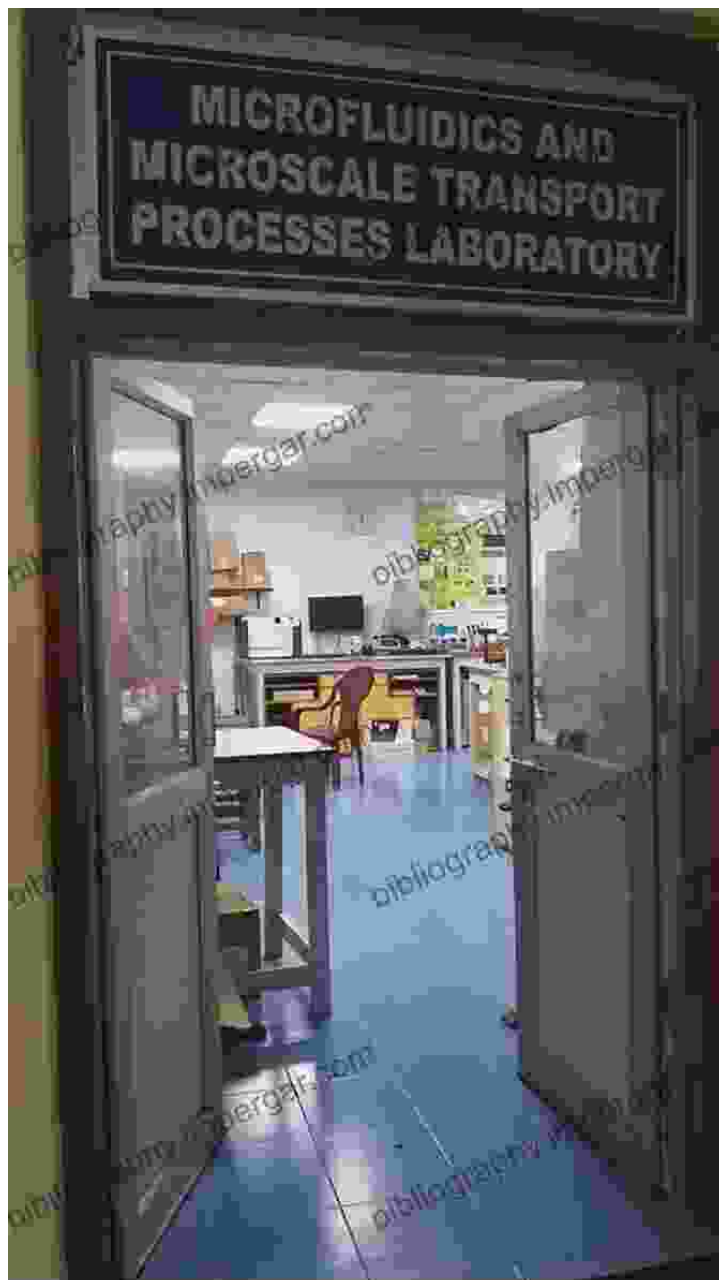


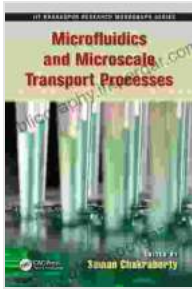
Microfluidics and Microscale Transport Processes: A Journey into the Unseen



**Microfluidics and Microscale Transport Processes (IIT
Kharagpur Research Monograph Series)**

by Suman Chakraborty

★★★★★ 5 out of 5



Language : English
File size : 13216 KB
Print length : 366 pages



Enter the realm of microfluidics, where the flow and manipulation of fluids at microscopic scales open up a world of possibilities. *Microfluidics and Microscale Transport Processes*, a comprehensive research volume from IIT Kharagpur, delves into this fascinating field, exploring its fundamental principles and groundbreaking applications.

The Science of Microfluidics

Microfluidics focuses on the behavior of fluids in microchannels, miniaturized structures with dimensions typically ranging from microns to millimeters. This unique environment allows for precise control over fluid flow, enabling scientists and engineers to manipulate and analyze fluids with unprecedented accuracy.

This book provides a thorough grounding in the underlying transport processes governing microfluidic systems. From fluid mechanics and thermodynamics to electrokinetics and mass transfer, readers gain a deep understanding of the fundamental principles that dictate fluid behavior at the microscale.

Applications in Healthcare and Beyond

The applications of microfluidics extend far beyond the laboratory. In the biomedical realm, microfluidic devices have revolutionized diagnostics, drug delivery, and tissue engineering. Researchers can now perform complex analyses on tiny samples of bodily fluids, enabling early detection and personalized treatment of diseases.

Beyond healthcare, microfluidics has found applications in diverse fields such as manufacturing, energy, and environmental science. The ability to manipulate fluids at such small scales offers unique advantages in areas like microelectronics cooling, chemical synthesis, and water purification.

Research Highlights from IIT Kharagpur

IIT Kharagpur has emerged as a global leader in microfluidics research. This book showcases the groundbreaking work of the institute's researchers, delving into their innovative designs and cutting-edge applications.

One of the highlights of the book is the development of microfluidic devices for rapid and cost-effective diagnostics. These devices have the potential to transform healthcare in resource-limited settings by providing diagnostic capabilities at the point-of-care.

Another area of focus is the design of microfluidic systems for enhanced heat transfer. These systems hold promise for improving the efficiency of microelectronics cooling, a critical challenge in the rapidly growing field of electronics.

Education and Training

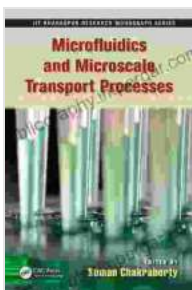
Microfluidics and Microscale Transport Processes is not only a valuable resource for researchers but also serves as an excellent educational tool for students and aspiring professionals in the field.

The book's comprehensive coverage and engaging writing style make it an ideal textbook for graduate-level courses in microfluidics and microscale transport processes. It provides a solid foundation in the theory and applications of microfluidics, preparing students for research and industry careers.

Microfluidics and Microscale Transport Processes is an essential resource for anyone interested in this rapidly evolving field. From fundamental principles to cutting-edge applications, this book offers a comprehensive exploration of microfluidics and its transformative impact across multiple disciplines.

Whether you are a researcher seeking to push the boundaries of microfluidic technology or a student eager to embark on a career in this exciting field, this book will provide you with the knowledge and inspiration you need.

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