

Microscale Surface Tension and its Applications

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More than 200 years since the earliest scientific investigations by Young, Laplace and Plateau, liquid surface tension is still the object of thriving fundamental and applied research. Partly inspired by nature's evolutionary designs exploiting physical properties inherent to liquids, this research is enabling a rich and ever expanding set of technological applications. *Micromachines*' Special Issue on "Microscale Surface Tension and its Applications" was therefore conceived to present fundamental knowledge, showcase relevant ongoing works and highlight prospective research directions regarding capillarity, wetting, and collateral topics.

Building on significant advances in miniaturization and soft matter, as well as in metrology and interfacial engineering, surface tension effects are indeed a major key to current developments in soft and fluidic microrobotics, precision micromanipulation and fluid/solid interactions. Benefiting from scaling laws, surface tension and capillary effects are expected to enable and support sensing, actuation, adhesion, confinement, compliance, and other structural and functional properties necessary in micro- and nanosystems.

This Special Issue successfully gathered novel and multidisciplinary contributions on capillary micromechatronics (capillary grippers, vibration-induced transport of droplets, capillary actuators, self-alignment), superhydrophobic and self-lubricating surfaces, solute-capillary Marangoni-based micromixing, and droplets micromanipulation. Worth highlighting are also two reviews on interfacial tension measurement and self-cleaning surfaces.

This varied and stimulating ensemble of contributions echoes many of the interests and directions identified during the 1st International Conference on Multiscale Applications of Surface Tension (microMAST 2016), organized in September 2016 by the Belgian thematic network on Microfluidics and Micromanipulation (www.micromast2016.be). The goal of that conference and network was, and remains, to bring together various, interrelated or complementary research communities to collectively address up-to-date and unsolved questions concerning the broad field of surface tension effects.

In recapitulating the spirit of that ongoing enterprise, we hope that the interplay between fundamental questions and relevant applications driven by the downscaling of capillary effects captured in this Special Issue will provide an inspiring point of view for the readership of *Micromachines*.

Surface Science And Its Applications

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Table of Contents Surface Science And Its Applications

1. Understanding the eBook Surface Science And Its Applications
 - The Rise of Digital Reading Surface Science And Its Applications
 - Advantages of eBooks Over Traditional Books
2. Identifying Surface Science And Its Applications
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Surface Science And Its Applications
 - User-Friendly Interface
4. Exploring eBook Recommendations from Surface Science And Its Applications
 - Personalized Recommendations
 - Surface Science And Its Applications User Reviews and Ratings
 - Surface Science And Its Applications and Bestseller Lists

5. Accessing Surface Science And Its Applications Free and Paid eBooks
 - Surface Science And Its Applications Public Domain eBooks
 - Surface Science And Its Applications eBook Subscription Services
 - Surface Science And Its Applications Budget-Friendly Options
6. Navigating Surface Science And Its Applications eBook Formats
 - ePub, PDF, MOBI, and More
 - Surface Science And Its Applications Compatibility with Devices
 - Surface Science And Its Applications Enhanced eBook Features
7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Surface Science And Its Applications
 - Highlighting and Note-Taking Surface Science And Its Applications
 - Interactive Elements Surface Science And Its Applications
8. Staying Engaged with Surface Science And Its Applications
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Surface Science And Its Applications
9. Balancing eBooks and Physical Books Surface Science And Its Applications
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Surface Science And Its Applications
10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
11. Cultivating a Reading Routine Surface Science And Its Applications
 - Setting Reading Goals Surface Science And Its Applications
 - Carving Out Dedicated Reading Time
12. Sourcing Reliable Information of Surface Science And Its Applications
 - Fact-Checking eBook Content of Surface Science And Its Applications
 - Distinguishing Credible Sources
13. Promoting Lifelong Learning

- Utilizing eBooks for Skill Development
- Exploring Educational eBooks

14. Embracing eBook Trends

- Integration of Multimedia Elements
- Interactive and Gamified eBooks

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