



*Special Issue Reprint*

## Microscale Surface Tension and Its Applications

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Edited by  
Pierre Lambert  
Massimo Mastrangeli



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Building on advances in miniaturization and soft matter, surface tension effects are a major key to the development of soft/fluidic microrobotics. Benefiting from scaling laws, surface tension and capillary effects can enable sensing, actuation, adhesion, confinement, compliance, and other structural and functional properties necessary in micro- and nanosystems.

Various applications are under development: microfluidic and lab-on-chip devices, soft gripping and manipulation of particles, colloidal and interfacial assemblies, fluidic/droplet mechatronics. The capillary action is ubiquitous in drops, bubbles and menisci, opening a broad spectrum of technological solutions and scientific investigations. Identified grand challenges to the establishment of fluidic microrobotics include mastering the dynamics of capillary effects, controlling the hysteresis arising from wetting and evaporation, improving the dispensing and handling of tiny droplets, and developing a mechatronic approach for the control and programming of surface tension effects.

In this Special Issue of Micromachines, we invite contributions covering all aspects of microscale engineering relying on surface tension. Particularly, we welcome contributions on fundamentals or applications related to:

Drop-botics: fluidic or surface tension-based micro/nanorobotics: capillary manipulation, gripping, and actuation, sensing, folding, propulsion and bio-inspired solutions;

Manipulation of droplets, bubbles and liquid bridges: dispensing, confinement, displacement, stretching, rupture, evaporation;



of surface tension effects: surface tension gradients, active surfaces, wetting, electrowetting, elastocapillarity;

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