

1. Record Nr.	UNINA9910367751503321
Autore	Lambert Pierre
Titolo	Microscale Surface Tension and Its Applications
Pubbl/distr/stampa	MDPI - Multidisciplinary Digital Publishing Institute, 2019
ISBN	3-03921-565-5
Descrizione fisica	1 electronic resource (240 p.)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Sommario/riassunto	<p>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; Control of surface tension effects: surface tension gradients, active surfactants, thermocapillarity,</p>

electrowetting, elastocapillarity; Handling of droplets, bubbles and liquid bridges: dispensing, confinement, displacement, stretching, rupture, evaporation; Capillary forces: modelling, measurement, simulation; Interfacial engineering: smart liquids, surface treatments; Interfacial fluidic and capillary assembly of colloids and devices; Biological applications of surface tension, including lab-on-chip and organ-on-chip systems. We expect novel as well as review contributions on all aspects of surface tension-based micro/nanoengineering. In line with Micromachines' policy, we also invite research proposals that introduce ideas for new applications, devices, or technologies.
