

Interfacial Engineering in Microsystems – Moving and Assembling Chips and Drops

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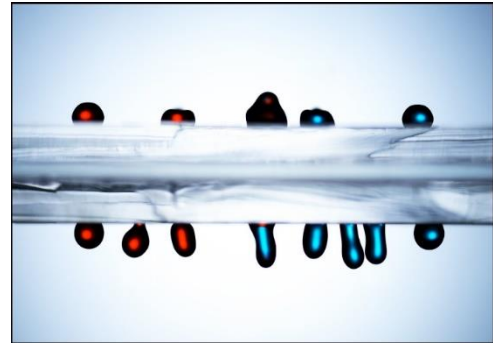
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Abstract

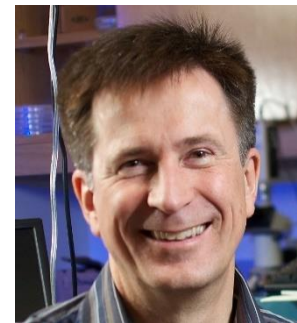
A well-known result of down-scaling to micro or nano dimensions is the dominance of surface over bulk phenomena. Thus, when designing micro-scale systems, the ability to model and control surface properties is of utmost importance. A key concept is the “programmable surface” – an interface whose properties can be controlled with high spatial and temporal resolution. This presentation introduces several kinds of engineered programmable surfaces and shows their application in self-assembling microsystems, droplet-based microfluidic systems and self-cleaning surfaces.



Droplets moving on a vibrating substrate with anisotropic microtexture.

Biography

Karl F. Böhringer received his Dipl.-Inform. degree from the University of Karlsruhe, Germany in 1990 and his M.S. / Ph.D. degrees in computer science from Cornell University, Ithaca, NY in 1993 / 1997. He was a Visiting Scholar at Stanford University in 1994-95 and a Postdoctoral Researcher at the University of California, Berkeley from 1996 to 1998. He joined the University of Washington in Seattle, WA in 1998, where he is currently Professor of Electrical & Computer Engineering and Bioengineering, Director of the Nano-engineered Systems Institute, and Site Director for the University of Washington / Oregon State University node in the NSF National Nanotechnology Infrastructure Network. He held visiting faculty positions at the Universities of Tohoku, Tokyo, Kyoto (Japan), São Paulo (Brazil) and École Polytechnique Fédérale de Lausanne (Switzerland).



Karl F. Böhringer is a fellow of IEEE. His awards include the John M. Fluke Distinguished Chair of Engineering at the University of Washington in 2010, an Invitational Fellowship for Research in Japan by the Japan Society for the Promotion of Science (JSPS) in 2004, an IEEE Robotics & Automation Society Academic Early Career Award in 2004, an NSF CAREER Award in 1999, and an NSF Postdoctoral Associateship in 1997. His work was listed among the “Top 100 Science Stories of 2002” in *Discover* magazine. He has served as editor for *ASME/IEEE Journal of Microelectromechanical Systems*, *IEEE Transactions on Automation Science and Engineering*, *Frontiers in Mechanical Engineering* and *Nature Publishing Group Microsystems & Nanoengineering*. He has served, among others, on the technical program committees for the *IEEE International Conference on Microelectromechanical Systems (MEMS)* and the *International Conference Solid-State Sensors, Actuators and Microsystems (Transducers)* conferences, and he was general co-chair of *IEEE MEMS* in 2011.