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Droplet dynamics on chemically striped patterned surfaces PATRICK JANSEN, KAI SOTTHEWES, HAROLD ZANDVLIET, STEFAN KOOIJ, University of Twente — We study the dynamics of droplets on chemically striped patterned surfaces with alternating hydrophilic and hydrophobic stripes. A droplet deposited on such a surface typically adopts an elongated shape, due to preferential spreading; across the stripes spreading is more difficult than in the direction along the stripes. The shape evolution of a droplet on such a surface is investigated both in experiment, and numerical simulations employing the lattice Boltzmann technique. The shape is dependent on the path that is taken, the amount of kinetic energy, and the size of the droplet in comparison to the stripe dimension. Additionally, we also investigate the evaporation of water droplets on these surfaces. Elongated droplets evaporate markedly faster than spherical ones making the evaporation rate dependent on the striped pattern underneath the droplet. Finally, a gradient in surface energy can be constructed using these stripes, which enables droplet movement on the surface without applying additional external forces.

Patrick Jansen
University of Twente

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