

Superhydrophobic surfaces

M. Rossier, E. K. Athanassiou, W. J. Stark

Functional Materials Laboratory – ETH Zurich



Goal

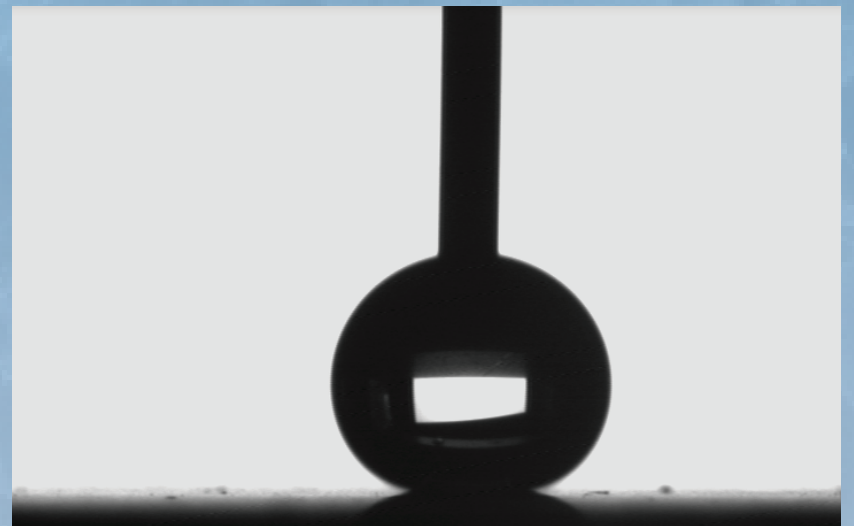
Production of a highly hydrophobic surface to limit the pressure drop in microchannels with application in water cooling systems

Approach

Creation of a coated nanostructure

Constraints

- Stable over a long period of time
- Possible manufacturing in channels



Contact angle measurement on the functionalized "crater-like" surface - 153°

non-functionalized surface

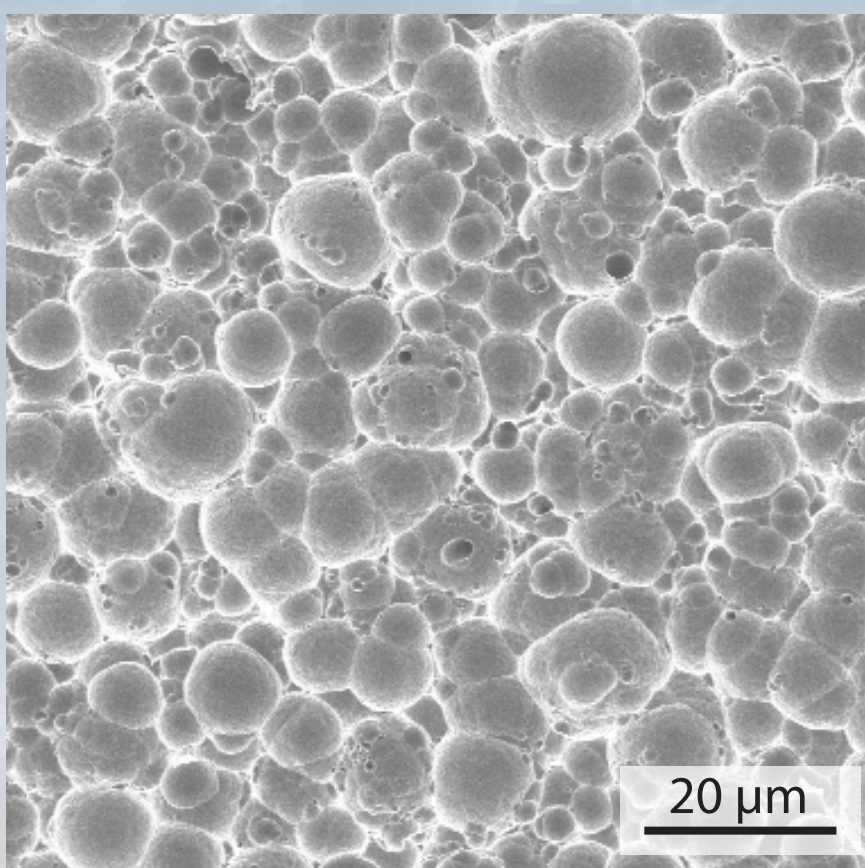


functionalized surface



contact angle 155°

"Needle-like" silicon structures: non-functionalized (left); functionalized with perfluorooctyltriethoxysilane (right)



"Crater-like" silicon etching

Surface nanostructure

- Top-down: silicon etching
- Needle or crater-like

Surface functionalization

- Fluorosiloxanes

Functionalization methods

- Solution chemistry
- Vapor phase deposition