Study of boiling mechanisms using biphilic surfaces

Ricardo Cautela

Laboratory of Thermofluids, Combustion and Energy Systems
Center for Innovation, Technology and Policy Research IN+

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Supervisor(s): Prof. António Moreira
Dra. Ana Moita

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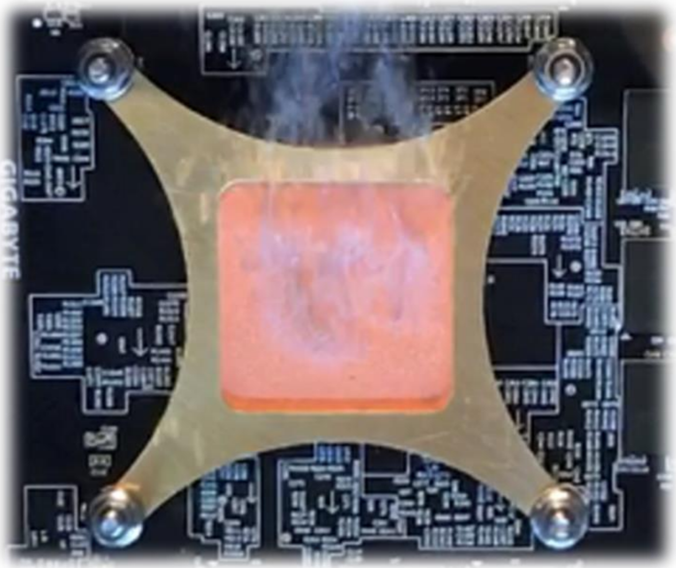
Phase Change Liquid Cooling Applications

Developed by Der8auer



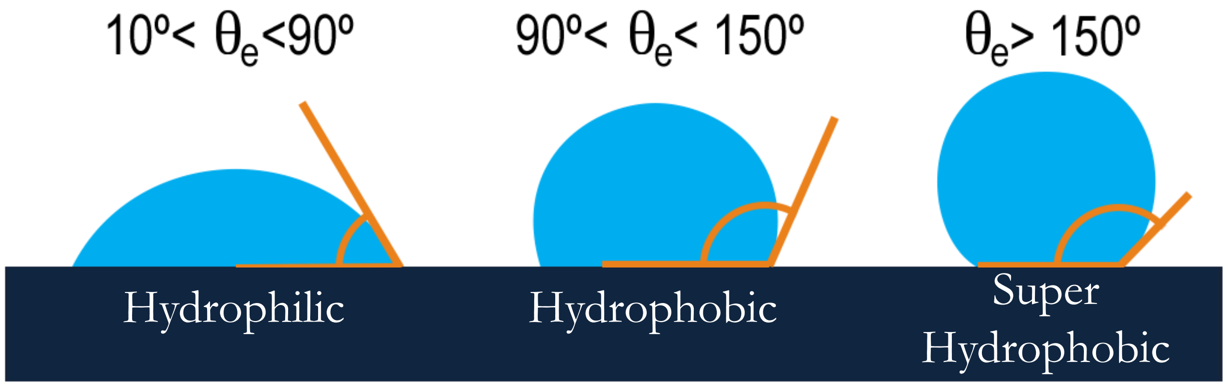
Developed by Thermal Solutions

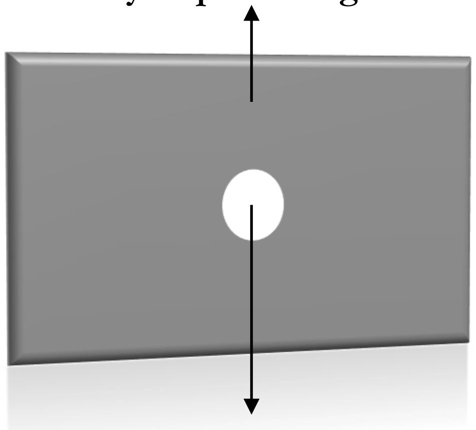
Developed by Der8auer

Biphilic Surfaces

- Biphilic Surfaces are composed of different wettability regimes. In this case the surfaces are hydrophilic with added superhydrophobic spots.

- Superhydrophobic behavior is achieved either by coating or structuring.

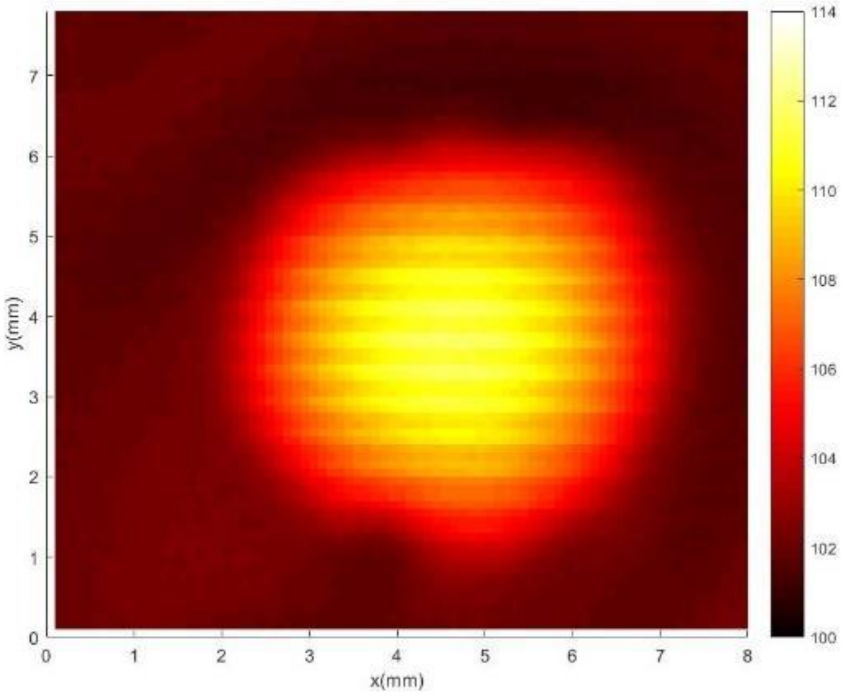


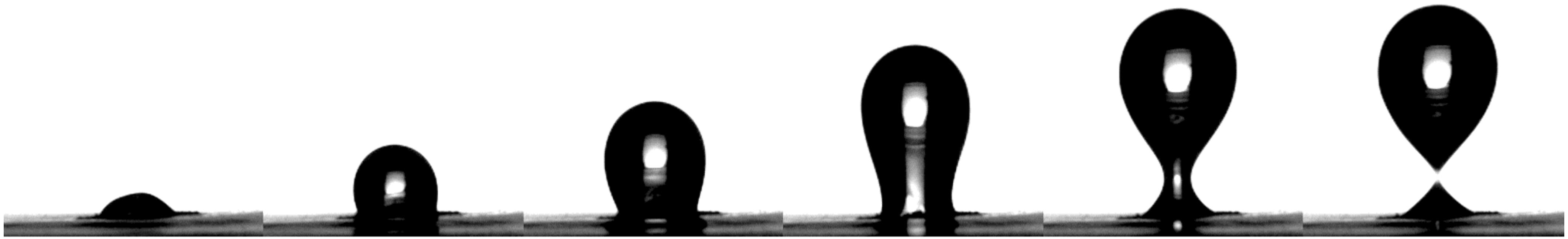


Main Objectives

- Studying single bubble dynamics on biphilic surfaces

- Analyzing the biphilic surface temperature distributions

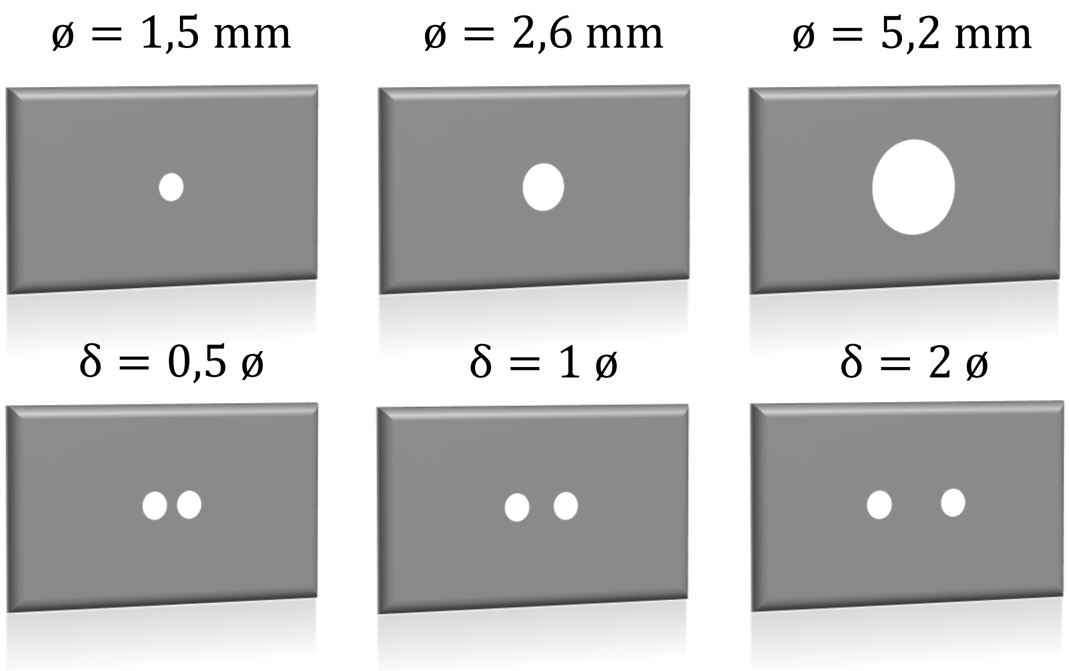


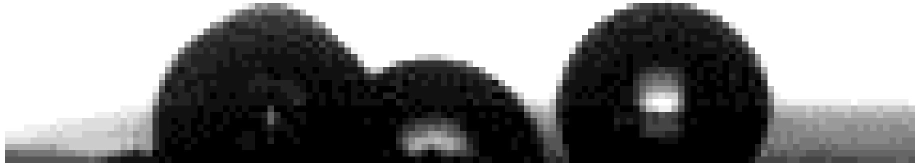


Main Objectives

- Vary the geometric parameters of the biphilic patterns

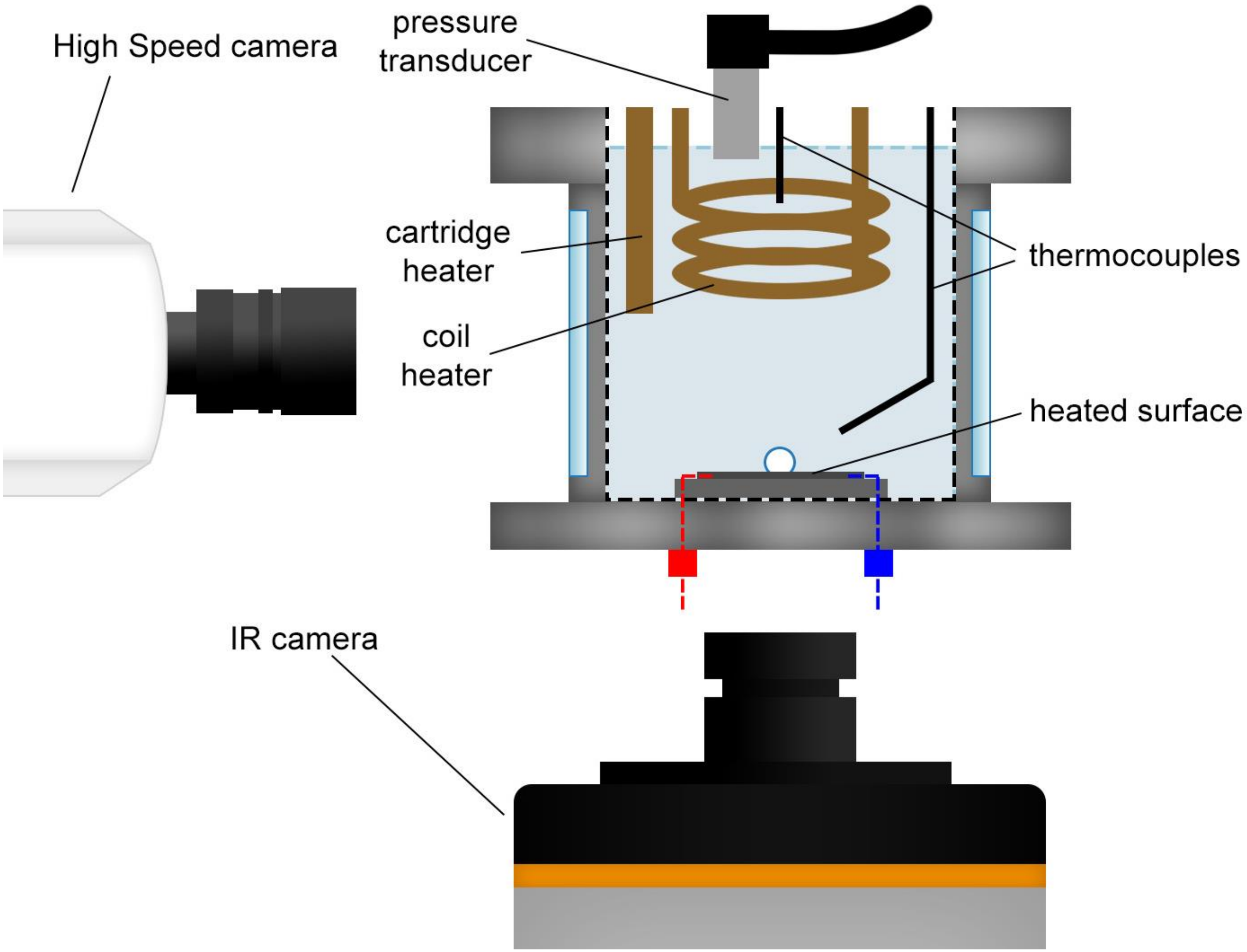
- Accomplish an ideal biphilic configuration





Experimental setup

- High Speed Imaging
- Thermography



Main conclusions

- Smaller superhidrophobic regions promote larger evaporated mass flux ratio in terms of total area i.e. larger latent heat removal

- Optimum distance between superhydrophobic regions is approximately the size of one diameter of a superhydrophobic region

Thank you for your attention!