

Abstract Submitted
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Optimising Boiling by Surface Design from the Nanoscale Upwards¹ EDWARD SMITH, TASSOS KARAYIANNIS, Brunel University London, PRASHANT VALLURI, Edinburgh University , ALESSIO LAVINO, OMAR MATAR, Imperial College London — Molecular Dynamics (MD) is a promising approach for capturing the fundamental mechanism underpinning bubble nucleation, a challenge which cannot be overcome by traditional computational fluid dynamics (CFD) models. By constructing a heated surface at the molecular scale, we model the creation and growth of a bubble. In this talk, we present an introduction to MD, before showing nucleation results for a range of different surfaces. Nucleation rates are seen to depend on the details of the surface and we discuss insights provided by the MD approach. The challenge is to make these MD data relevant to larger scales, by linking these nanoscale bubbles to CFD simulations and optimising surface design to maximise nucleation. We discuss potential solutions to this problem, using multi-scale methods guided by a programme of experimental measurements.

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