Abstract for an Invited Paper
for the DFD06 Meeting of
The American Physical Society

Bubble Puzzles

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Bubbles are fascinating. With their ubiquitous occurrence in a multitude of fluid systems bubbles occupy a very important place in contemporary science and technology. In many applications, bubble control is crucial. I will demonstrate that bubble nucleation at surfaces, which always has been associated with randomness, can be perfectly controlled both in space and time. This new technique allows to quantitatively study bubble-bubble and bubble-surface interaction and reveals a shielding effect in bubble clusters [1]. – In a second example for the importance of bubble control I will discuss their disturbing effect in piezo-acoustic ink-jet printing: I will show how bubbles are entrained, grow by rectified diffusion, and finally seriously disturb the jetting process by counteracting the pressure build-up at the nozzle [2].

[1] N. Bremond, M. Arora, C. D. Ohl, and D. Lohse, Phys. Rev. Lett. 96, 224501 (2006).
[2] J. de Jong, H. Reinten, M. van den Berg, H. Wijshoff, M. Versluis, G. de Bruin, and D. Lohse, J. Acoust. Soc. Am., (August 2006).