

Subwavelength Acoustic Resonators: From Super-resolution to Metamaterials

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The aim of this talk is to review recent results on the propagation of acoustic waves in bubbly media. The speaker and his collaborator's main focus is on developing a mathematical and computational framework for the analysis of Minnaert bubbles. By characterizing and exploiting the Minnaert resonance frequencies of bubbles in a variety of situations, they construct a unified theory of super-focusing of acoustic waves, acoustic metamaterials, and controlling acoustic wave propagation at the subwavelength scale. Super-resolution and metamaterials are usually studied within the context of different approaches. Remarkably, as shown in this talk, they owe their origin to the same underlying physical mechanism, namely, wave interaction with a subwavelength resonator.