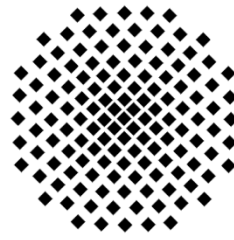


Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

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Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

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Acoustic holography – projecting pressure images

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Abstract

Dennis Gabor invented the hologram to refine electron microscope images. Early attempts to explore holography were undertaken with ultrasound, but since the advent of the laser, almost all holographic demonstrations are optical. Surprisingly, the acoustic analogue of the hologram had not been realized. I will show that it can be used to simplify an otherwise cumbersome technology to generate the most sophisticated pressure images to date. Since sound waves can also exert forces, the hologram can be used for actuation and assembly, especially at small scales. I will describe ongoing work to realize the first fully connected 3D hologram, as well as its use to assemble matter and, in particular, biological cells into 3D objects in “one shot”. New simple technologies that may one day enable the projection of high-resolution pressure patterns are discussed.