

# Seminar über Nichtlinearität und Unordnung in komplexen Systemen

Am Montag, dem 13. Mai 2019, um 16:15 Uhr im Gebäude 16, Raum 154 findet der Vortrag von

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statt.

## “Acoustic Streaming and the impact of nonlinear acoustics”

### Abstract

This talk is about acoustic streaming in water at very high ultrasonic frequencies beyond 100 MHz.

At such high frequencies, the dissipation length of acoustic waves shrinks considerably and with higher amplitudes the nonlinearity of the sound field has an increasing impact on the streaming.

The streaming is generated by rather local and strong momentum transfer of a highly damped and therefore rapidly decaying (nonlinear) wave. The inertia of the induced flow cannot be neglected anymore, and a potentially turbulent jet flow emerges. Here we report on streaming velocity measurements for the case where the sound is completely absorbed within a region much smaller than the generated jet. In contrast to previous work in this frequency range, where mainly surface acoustic wave transducers have been employed, we use piston-type transducers that emit vertically to the transducer surface. The acoustic streaming effects are characterized by ink front tracking, particle image velocimetry and are compared to numerical studies. Simulations show the importance of consideration of nonlinear wave propagation.

