

# Imploding bubbles destroy PFAS in contaminated water

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The project focuses on modeling and simulating the dynamics of gas bubbles exposed to ultrasound as a potential technique for the destruction of harmful per- and polyfluoroalkyl substances (PFAS). It will be carried out in collaboration with the experimental research conducted in the Department of Civil and Environmental Engineering at NJIT, led by Prof. Meegoda. The primary aim is to understand the interaction between bubbles and the ultrasonic field, particularly regarding the production of high temperatures on bubble implosion, which is expected to be crucial for destroying PFAS (see the figure). One specific focus of the project is optimizing the influence of material parameters, such as surface tension, which is known to play a significant role. The mathematical aspects involve modeling and simulating bubble dynamics, as well as advancing the understanding of the collective dynamics of bubble clouds in the presence of ultrasound. The project includes both experimental and theoretical researchers, with the participating mathematics student benefiting from significantly reduced teaching duties therefore allowing extra time to focus on research.

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