

Seminar

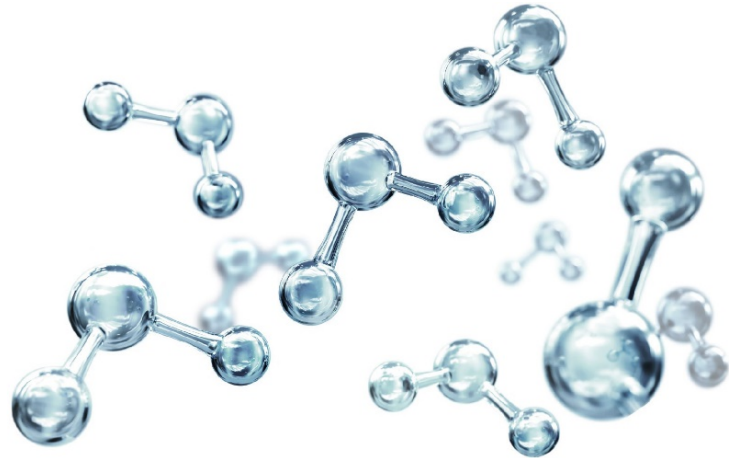
25th of November 2021
12:00 h

Zoom Virtual Meeting:

<https://desy.zoom.us/j/84703564086>

Meeting-ID: 847 0356 4086

Password: 570173



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X-ray Imaging of Cavitation Dynamics with Free-Electron Laser Pulses

Cavitation bubbles can be seeded from a plasma following optical breakdown, by focusing an intense laser in water. The fast dynamics are associated with extreme states of gas and liquid, especially in the nascent state. This offers a unique setting to probe water and water vapor far-from equilibrium. However, current optical techniques cannot quantify these early states due to contrast and resolution limitations. X-ray holography with single X-ray free-electron laser pulses has now enabled a quasi-instantaneous high resolution structural probe with contrast proportional to the electron density of the object. In this work, we demonstrate cone-beam holographic flash imaging of laser-induced cavitation bubbles in water with nanofocused X-ray free-electron laser pulses. We quantify the spatial and temporal pressure distribution of the shockwave surrounding the expanding cavitation bubble at time delays shortly after seeding and compare the results to numerical simulations.

