

LASER-DRIVEN MELTING AND BOILING ON THE NANOSCALE

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Single-shot coherent diffractive imaging (CDI) allows to visualize directly the structure and dynamics of isolated nanosamples. We investigate the dynamics in laser-heated plasmonic nanoparticles via single-particle CDI, finding a wide range of processes from surface to full melting, internal boiling, cavitation, expansion and inflation, droplet vibrations, up to explosive boiling. Molecular dynamics simulations enable extracting previously inaccessible properties of matter under extreme conditions.

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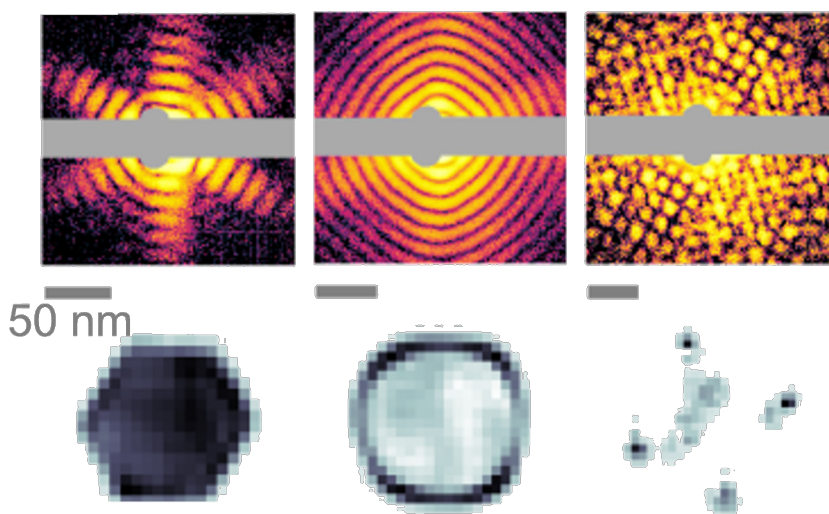


Figure adapted from Dold et al., preprint on arXiv 2309.00433