

## Frontiers of time-resolved single-particle coherent diffractive imaging

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“Intense X-ray free-electron laser pulses allow to obtain “snapshots” of individual nanoparticles in free flight. The accessible size regime roughly ranges from tens of nanometers up to a few micrometers with a spatial resolution of few nanometers and a temporal resolution of 50 femtoseconds or better. Thus, the approach called single-shot single-particle Coherent Diffractive Imaging (CDI) opens up ample opportunities for atmospheric research, such as structure determination of aerosols from combustion or the study of freezing in supercooled water droplets. Basically all processes in aerosols that are influenced or disturbed by a substrate or surrounding medium may be good candidates.

I will introduce the CDI method and novel approaches for time-resolved studies and discuss our recent findings on nanoparticle shapes and dynamics.”

### Significance

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**Session Classification:** Ultrafast or time-resolved