

Levitodynamics: use of levitated nanoparticles in the study of stochastic thermodynamics, aerosols, and materials science

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Micro and nanoparticles can be individually levitated by different trapping mechanisms, among which optical tweezers and Paul traps are the most extended approaches. Even if they do not diffuse away due to the presence of the trap, trapped particles are still subjected to Brownian motion due to collisions with gas molecules. The analysis of the dynamics of trapped particles provides very useful information about the properties of the particles and the environment, allowing one to perform a variety of experiments in which a particle is used as an ultrasensitive probe. In this talk, I will present recent works that demonstrate the versatility and applicability of the technique in a large variety of fields, going from non-equilibrium dynamics to materials science to aerosol physics.