UNIVERSITÄT LEIPZIG

Fakultät für Physik und Geowissenschaften

Prof. Dr. J. Deiglmayr
Prof. Dr. J. Vollmer

Physics Colloquium

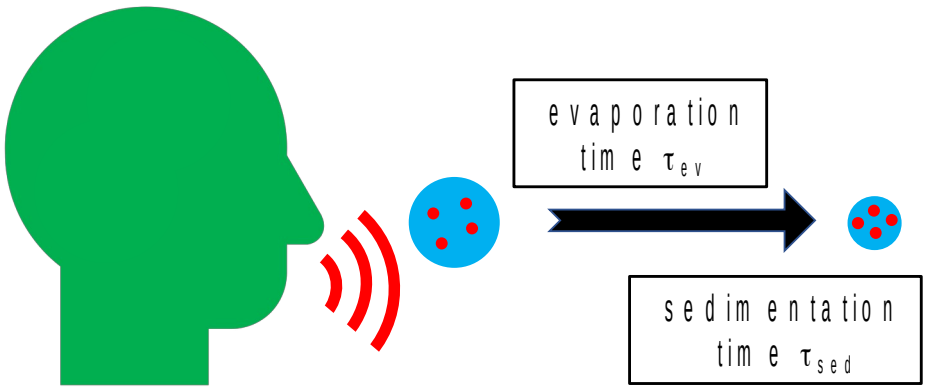
Tuesday, 15 June 2021 at 17:00

Prof. Dr. Roland Netz

Fachbereich Physik, FU Berlin

Physical mechanisms of evaporation and sedimentation of aerosol droplets produced by speaking

For estimating the infection risk from pathogen-containing airborne droplets, it is crucial to consider the interplay of all relevant physical effects that affect droplet evaporation and sedimentation times. For droplet radii in the range 70 nm < R < 60 µm, evaporation can be described in the stagnant-flow approximation and is diffusion-limited. Evaporation makes the time for initially large droplets to sediment much longer and thus significantly increases the aerosol air load. Low relative humidity, as encountered in airliners and inside buildings in the winter, accelerates evaporation and thus keeps initially larger droplets suspended in air. Non-volatile solutes in the droplets on the other hand slow down the evaporation. Typical air-exchange rates decrease the aerosol concentration in closed rooms with an initial radius larger than 20 µm only moderately.



R. R. Netz, J. Phys. Chem. B 2020, 124, 7093–7101

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