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Hydrophobicity at small and large length scales

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This lecture is about the statistics of density fluctuations for liquids at thermodynamic states close to liquid-vapor coexistence. Theoretical and simulation results on the length scale dependence of this statistics will be described and used to explain hydrophobic solvation, hydrophobic forces of assembly and kinetics of hydrophobic collapse. Several issues concerning so-called "drying" near extended hydrophobic surfaces will be addressed, and biophysical implications will be discussed.