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Fluctuation and dissipation of heat in a complex biological environment

The purpose of this talk is to introduce a microscopic description of heat in different biological environments. Using the framework of the linear response theory and illustrated with molecular dynamics simulations, we will discuss specific configurations where the thermal energy flux are controlled at the nanoscale to target medical applications. The outline of the presentation is constructed in three parts: The first discuss electromagnetic absorption by nano-objects like plasmonic and magnetic nano-particles. The next presents some illustrations of the relaxation at their interface with a fluid. Finally, we will consider the triggering the phase transitions in cell membranes and their experimental imaging with fluorescent molecules.

