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### **Macroscopic Quantum Electrodynamics and Dispersion Forces**

Dispersion forces are effective forces acting between well-separated, neutral, unpolarized and unmagnetized objects, mediated by the quantum fluctuations of the electromagnetic field. They comprise the intriguing Casimir force between two macroscopic bodies, the vander Waals force between molecules, and the less known Casimir-Polder force between a molecule and a macroscopic body.

When explaining these interactions, the frequency dependence of macroscopic properties, such as the refractive indices of the objects involved, play a constitutive role. They account for the response of these objects to the quantized electromagnetic field. Hence, in order to describe dispersion forces, a solid insight into macroscopic quantum electrodynamics is required.

In this lecture, we will introduce the basic concepts of macroscopic quantum electrodynamics and employ the minorder to study the interaction of an atom with a dielectric body at zero temperature.