

IRTG-Seminar



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“Fluctuation-induced interactions in meso- and microscopic systems”

Fluctuations are omnipresent in both the classical and the quantum world and they are connected with a panoply of phenomena in different areas of physics, ranging from biophysics to gravity, from chemistry to cosmology. They play a key role in fundamental processes like decoherence, thermal transport, and they lead to the appearance of forces between atoms, molecules (van der Waals) and extended bodies (Casimir effect). These phenomena govern biological processes and are relevant for colloidal matter, cell membranes, proteins and, in general, the structure of molecules and solids. Their exact understanding is therefore rapidly becoming important for the characterization of modern experimental set-ups.

The study of these phenomena is highly multidisciplinary and requires an all-around perspective on how different topics like statistical physics, condensed matter theory, electromagnetism, quantum field theory and atomic physics merge in the microscopic and mesoscopic world.

In this talk I will shortly review the physics behind these interactions, illustrating with some recent results their relevance for fundamental investigations and for future technologies.

**Tuesday, December 5, 2017, 1:00 p.m., HS II,
Physics high rise, Hermann-Herder-Str. 3**