

Long-Range Casimir Forces: Theory and Recent Experiments on Atomic Systems, Frank S. Levin, David A. Micha, 2013, Springer US, 2013, 358 pages, 9781489912299

Atomic theory is the scientific theory that matter is composed of particles called atoms. Atomic theory traces its origins to an ancient philosophical tradition known as atomism. According to this idea, if one were to take a lump of matter and cut it into ever smaller pieces, one would eventually reach a point where the pieces could not be further cut into anything smaller. Ancient Greek philosophers called these hypothetical ultimate particles of matter *atomos*, a word which meant "uncut".

Long-Range Casimir Forces: Theory and Recent Experiments on Atomic Systems. F. Levin, D. Micha, P. Milonni. Physics. Book Review: Stars as laboratories for fundamental physics / U Chicago Press, 1996. G. Raffelt. Physics. Feinberg and J. Sucher, in Long-Range Casimir Forces: Theory and Recent Experiments in Atomic Systems. 1989. Magic without Magic. In atomic physics the long-range Casimir interaction leads to corrections to the energy levels of Rydberg states. In quantum electrodynamics a number of Casimir-type effects arise when the radiative processes and associated energy shifts are modified by the presence of the cavity walls. In mathematical physics the investigation of the Casimir effect has stimulated the development of powerful regularization and renormalization techniques based on the use of zeta functions and heat kernel expansion. But in a recent theoretical study Hertzberg [5] showed that this is due to the neglectance of cutoff during Casimir force calculations for real materials. When this is taken into account, the force changes from repulsive to attractive.