CTN LINDHARD LECTURE

Peter Hänggi, University of Augsburg

With pioneering contributions ranging from fundamental statistical mechanics to quantum transport, Peter Hänggi (born 1950) of the University of Augsburg has made a variety of seminal advances in physics. His most impressive body of work includes that of applying the laws of Brownian motion for the phenomenon of Stochastic Resonance, his invention and design of Brownian motors and his discovery of coherent destruction of quantum tunneling and, as well, his conceptional advances of relativistic thermodynamics. Peter Hänggi is a member of several academies and has been awarded seven honorary doctor degrees already. See also http://www.physik.uni-augsburg.de/theo1/hanggi/

The Ring of Brownian motion: the good, the bad and the simply silly

Monday 14 June 2010 at 15:15, in Auditorium F (1534-125), Aarhus University

Since the turn of the 20-th century the jittery dynamics of Brownian motion has continuously disclosed a rich variety of phenomena in and around physics. The understanding of this noisy phenomenon has undoubtedly helped to reinforce and substantiate those pillars on which the basic modern physical theories are resting: Its formal description provided the key to great achievements in statistical mechanics, the foundations of quantum mechanics and also astrophysical phenomena. Although noise is usually thought of as the enemy of order it in fact also can be of constructive influence. The phenomena of Stochastic Resonance and Brownian motors present two such archetypes wherein random Brownian dynamics together with unbiased nonequilibrium forces beneficially cooperate in enhancing detection and/or in facilitating directed transmission of information. The applications range from innovative information processing devices in physics, chemistry, and in physical biology to new hardware for medical rehabilitation. Particularly, those additional non-equilibrium disturbances enable the rectification of haphazard Brownian noise so that quantum and classical objects can be directed around on a priori designed routes (Brownian motors).

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