

Gather the tunes!

A day with Jürg Fröhlich and his former orchestra

Friday, May 18, 2012

Location: HIT E 41.1, ETH Hönggerberg

09.15 - 10.00	<p>Gang Zhou, ETH Zürich</p> <p>Exponential convergence to the Maxwell distribution for some class of Boltzmann equations</p> <p>We consider a class of nonlinear Boltzmann equations describing return to thermal equilibrium in a gas of colliding particles suspended in a thermal medium. We study solutions in the space L^1. Special solutions of these equations, called "Maxwellians," are spatially homogenous static Maxwell velocity distributions at the temperature of the medium. We prove that, for dilute gases, the solutions corresponding to smooth initial conditions in a weighted L^1-space converge to a Maxwellian in L^1, exponentially fast in time.</p>
10.00 - 10.30	<p>Coffee Break</p>
10.30 - 11.15	<p>Benjamin Schlein, University of Bonn</p> <p>Dynamics of Bose-Einstein condensates of fermion pairs in the low density limit of BCS theory</p> <p>We show that the time-evolution of the wave function describing the macroscopic variations of the pair density in BCS theory can be approximated, in the dilute limit, by a time-dependent Gross-Pitaevskii equation.</p>
11.30 - 12.15	<p>Nilanjana Datta, University of Cambridge</p> <p>The strong converse property of classical capacities of quantum channels</p> <p>Two quantities characterizing a channel are its capacity and its strong converse rate. The former is the maximum rate at which information can be reliably transmitted through the channel, whereas the latter is the rate threshold above which information transmission fails with certainty. The capacity of a channel is said to satisfy the strong converse property if it is equal to its strong converse rate. For a memoryless quantum channel, it is known that the strong converse property is satisfied by its product-state classical capacity, i.e., its classical capacity evaluated under the constraint that the inputs are product states. As for</p>

	<p>the full classical capacity (in the absence of this constraint) the strong converse property has been proved to hold for certain classes of channels. Here we provide an explicit example of a channel with memory, for which the product-state classical capacity violates the strong converse property. Moreover, we prove that the strong converse property holds for the full classical capacity of two further classes of memoryless quantum channels.</p>
12.15 - 14.00	Lunch Break
14.00 - 14.45	<p>Wojciech De Roeck, University of Heidelberg</p> <p>Asymptotic completeness in the massless spin-boson model</p> <p>This talk concerns time-dependent phenomena in quantum field theory, like approach to the ground state, dispersion, friction, etc. Despite recent advances in the spectral theory of simple interacting quantum field theories, we do not have a robust mathematical control of these phenomena. The spin-boson model (or small variations of it) is one of the simplest models where these questions can be asked. We outline how to prove approach to ground state and asymptotic completeness in this model, following a recently developed time-dependent approach that takes inspiration from a mapping of the time-evolution onto one-dimensional statistical mechanics.</p>
15.00 - 15.45	<p>Bill Pedrini, PSI, Villigen</p> <p>Free electron lasers and the SwissFEL project</p>
15.45 - 16.15	Coffee Break
16.15 - 17.00	<p>Giovanni Felder, ETH Zürich</p> <p>The classical master equation</p> <p>We formalize the construction of Batalin and Vilkovisky of a solution of the master equation associated with a polynomial in n variables (or a regular function on a nonsingular affine variety). We show existence and uniqueness up to "stable equivalence" and discuss the associated BRST cohomology (joint work with David Kazhdan).</p>